

**THE EFFECTS OF LEARNING INTENTIONS AND  
CHOICE TASK ORIENTATIONS ON BUYERS' KNOWLEDGE OF PRICE:  
AN EXPERIMENTAL INVESTIGATION**

by

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(ABSTRACT)

This dissertation examines the process by which buyers encode and store price information in their memories and how the information is retrieved when such a need arises. Using theories in human learning and memory, it has been argued that buyers' learning of price information is primarily influenced by their learning plans and the criteria they use in choice decisions. Because of the differences in learning and choice task orientations, buyers are postulated to encode and store the information differently and therefore, different memory tests are necessary to investigate the retrieval mechanisms and thereby making inferences about their knowledge of price. While it is recognized that buyers may encode and retrieve price information in many different ways, this research has examined the differential impact of learning and choice task orientations on their recall, recognition, and ranking performances.

The hypotheses developed in this research were tested in a laboratory experiment using ninety women shoppers as subjects. The two levels of learning (incidental and intentional) and the three levels of choice task orientations (non-price, mixed, and price) were fully crossed in a 2 x 3

full-factorial between-subjects design. Subjects, after being randomly assigned to one of the six experimental conditions took part in a simulated grocery shopping. Having made their selections, subjects responded to recall, recognition, and ranking memory tests involving prices of the items selected. Subjects also indicated their confidence about the accuracy of their responses. The accuracy and confidence ratings were used as dependent measures when testing the hypotheses. Since accuracy measures were dichotomous (correct or incorrect) in nature, loglinear modes were tested using maximum likelihood estimation procedure. For continuous dependent measure (e.g. confidence), ordinary least square estimations were carried out in a univariate ANOVA framework. In addition, several multiple comparison procedures were used to test differences between mean accuracy and confidence scores.

The data analysis supported fifteen out of sixteen hypothesized relationships. The results supported the argument that buyers' learning of price information improves with greater use of price in their choice decisions and with greater need to remember the information for later use. Overall, recognition was found to be a more appropriate retrieval mechanism than recall. Need for remembering specific prices did not significantly improve buyers' ability to rank items in terms of their expensiveness.

The conceptualization and the research results are expected to make both theoretical and methodological contributions in pricing research. Particularly, the issues involving formation of reference prices and the manner in which the internal reference prices are retrieved and used in

choice decisions are partially addressed using a consumer information processing perspective. Nonetheless, future research is needed to resolve additional issues in price perception research.

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## CHAPTER I

### INTRODUCTION

This dissertation research used theories in human memory and learning to investigate the effects of learning intention (or the lack of it) and choice task orientations on buyers' point-of-purchase learning of prices. Specifically, it is argued that buyers may differ in terms of their relative reliance on internal and external memories for price information and their perceived importance of price in a given choice task. Because of these differences, buyers provide different degree of attention to price information and employ different learning plans and therefore, encode and store the information differently in their memories. To assess the extent buyers learn prices with different learning plans and with different choice task orientations, this research uses exact price recall, recognition, and relative price recall memory tests. The successes or failures of buyers to respond to the different memory tests were used to infer about how buyers encode price information under different conditions.

### THE PROBLEM

According to the classical economic view buyers are assumed to know not only the prices of products and services they purchase, but they also

must know the prices of all other products in their choice set that potentially can contribute to their utilities or satisfactions (Marshall 1920). Intrigued by the assumptions of classical theory about buyers' possessing perfect price information, a number of researchers have investigated whether or not buyers indeed pay attention to prices in their day-to-day shopping activities (Gabor and Granger 1961; Progressive Grocer 1974, 1977; Allen, Harrell, and Hutt 1976). These researchers typically have used shoppers' ability to correctly recall prices of previously purchased grocery items as a measure of their price awareness. This stream of research has shown that shoppers, when asked, experience considerable difficulty in recalling the exact prices of previously purchased items. Anomalous, as this finding is, it has led to two unresolved but extremely important issues in pricing research.

First, if price is to be considered an important factor in buying decisions, why do shoppers exhibit such a poor level of price recall accuracy? Also, can such failure to recall exact prices be used to infer that buyers have no memorial references of the prices of different products they purchase?

Second, some buyers were found to recall prices more accurately than others. In order to explain this difference, researchers have generally relied upon a variety of explanatory variables pertaining to shoppers' demographics, point-of-purchase behavior, product- and store-related characteristics. However, these variables by and large have not been able to explain the variations in shoppers' recall accuracies.

## OVERVIEW OF THE CONCEPTUALIZATION

It is argued that whenever buyers attempt to retrieve previously learned price information, either in response to an interviewer's question or for making a purchase decision, they are in essence responding to some form of memory test. Therefore, it is imperative that research in price awareness and price perception draws upon the available theories on human memory and learning instead of relying mainly on shoppers' demographics or other externally manifest criteria to address the issues stemming from previous research.

Theories on human memory and learning suggest that the ability or inability of individuals to retrieve previously learned information depends upon: (1) how the information was encoded and stored in their memories, and (2) whether or not the cues provided during the retrieval process are compatible with the original encoding process (Craik and Lockhart 1972; Wingfield and Byrnes 1981). The manner in which information is encoded and stored is influenced, among other factors, by the learning plans employed and by the extent the information was elaborated producing associative pathways connecting the target information with other information (Craik and Lockhart 1972; Anderson and Bower 1972). The retrieval process on the other hand involves activating the associative pathway, searching for the target information along the links, and deciding whether or not the information found is correct to report (Collins and Loftus 1975; Anderson 1974). Cues that are compatible with

the original encoding are likely to activate the information nodes more effectively than unrelated cues (Tulving and Thomson 1973).

As far as this research is concerned, it has been argued that shoppers differ on their overall shopping orientations depending upon their individual factors and shopping goals (Guiltinan and Monroe 1980). For example, some shoppers are extremely price conscious and use prices of different items as overriding criteria for choice decisions. Some of these shoppers may also exhibit explicit intent to remember prices to facilitate their prepurchase planning, store selections, or for following price movements over time. At the other end there are shoppers who are more convenience oriented and who use non-price factors for making purchase decisions. When necessary, these shoppers typically rely on point-of-purchase price information and do not feel the need for remembering prices for later use. Given this difference in overall shopping orientations, shoppers are likely to use different cognitive strategies to learn about prices and other information available from various sources. Thus, even though the external environment provides shoppers many opportunities to learn about prices of various items, the extent to which they are exposed to the information, the strategy they employ in attending to the information, and how elaborately they process the information in their memories will vary across shoppers (Helgeson and Beatty 1985).

The factors that influence human learning are: (1) individual motivation or intention to learn, and (2) the nature of tasks they perform during the process of learning, usually referred to as "orienting tasks"

(Eysenck 1982). This is true for consumer learning of price information as well (Bettman 1979b). For example, some shoppers may rely on their internal memories for price information for facilitating purchase decisions because they may anticipate that the required price information will not be easily available externally when needed. These shoppers are likely to make an attempt to remember price in order to prepare their shopping list, compare prices of different stores, and follow price movements over time. Also, there are other shoppers who do not make intentional efforts to memorize prices but rely on point-of-purchase price information in making a purchase decision (Bettman 1979b; Dickson and Sawyer 1986). Given this difference in shoppers' intention to learn about prices, it is postulated that the manner in which they guide their learning plans will differ.

While reliance on internal memory or point-of-purchase price information may influence buyers' learning of prices, the nature of the tasks they perform during the choice process assists or interferes with the learning (Bettman 1979b). For example, when choice decisions involve usage of non-price information (e.g., nutritional values, brand names), the buyers are distracted from the to-be-learned price information. On the other hand, when choice tasks require extensive usage of price information (e.g., searching for a low price due to limited shopping budget), buyers would pay close attention to prices and would elaborately process the information.

To summarize, this research proposes that the manner in which buyers encode and store price information in their memories will vary according

to their explicit intent to learn (or remember) price information and their perceived importance of price in a given choice task. In some learning contexts, encoding may be isomorphic with the numeric value of the price stimuli and can be recalled easily by a buyer when such a need arises (Bettman 1979b). In other cases, buyers may not perceive the need to encode price information for later recall, but can recognize whether or not a given price matches the original prices (Monroe, Powell, and Choudhury 1986). Yet, there may be other situations, where buyers can rank items in terms of their prices even though they may not be able to successfully recall or recognize the correct price (Zeithaml 1981, 1982).

Given the possibility of differences in the encoding process, shoppers are postulated to perform differently in different memory tests for price information. The hypotheses developed in this research primarily consider the differential effects of learning intention and task orientations on recall and recognition performance. However, it is recognized that these two memory tests may not capture other forms of encoding and therefore some proportion of subjects may not perform well in either test. Such results under most situations may be explained as retrieval failure rather than absence of information in memory (Murdock 1982). Additional research is needed in this area to develop other memory tests to tap these forms of memory organization of prices.

## OVERVIEW OF THE METHODOLOGY

The hypotheses developed in this research were tested through a laboratory experiment using ninety women shoppers as subjects. A two factor (learning intention and choice task orientations) fully crossed experimental design with two levels of learning (intentional and incidental, between subjects), and three levels of choice task orientations (price-based choice task, non-price-based choice task, and mixed choice task, between subjects) was used.

Subjects after being randomly assigned to one of the six experimental conditions (fifteen per cell) took part in a simulated grocery shopping task where they were provided with salient attribute information about seven packaged food products with the help of an information chart. Subjects were asked to select one item from each of the seven product categories based upon specific choice criteria that were varied to induce different choice task orientations. For example, the non-price-based choice task was induced by having the subjects make their selections using calorie and nutritional information. Subjects in the mixed choice task selected items on the basis of the nutritional value and prices. The price-based choice task was induced by requiring the subjects to make their purchase decisions using only price-related information.

Intentional learning was induced by alerting the subjects about a possible memory test involving prices of the selected items. No such instructions were given to subjects in the incidental learning condition.

After the subjects completed their selections, they responded to recall, recognition, and relative recall tests. Subjects performance in the memory tests were evaluated by (1) their response accuracy and (2) confidence ratings of the correctness of their responses. Accuracy was operationalized by the proportion of correct responses in the tests and confidence was measured with the help of a certainty rating scale.

Univariate ANOVA procedure was used to test for main effects and interaction effects of learning intention and choice task orientations on recall and recognition performance separately. When responses were dichotomous (correct or incorrect), the general linear model and the log-linear models were tested using weighted-least square and maximum likelihood estimation procedures respectively. However, for continuous response variables OLS estimations were used. The analysis also included multiple comparison procedures for comparing the memory test performances under different experimental conditions using tests for difference in proportions.

#### SUBSTANTIVE FINDINGS

Several substantive conclusions can be drawn from the research results. First, buyers' ability to recall and recognize previously encountered prices increases with greater use of price in their choice decisions. In other words, buyers who use prices of different items as their main choice criteria will have more stable memorial references of

price than buyers whose purchase decisions are primarily based on non-price factors.

Second, when buyers anticipate that the required price information may not be easily available from external sources, they guide their learning plans in a way that facilitates later recall of prices. Therefore, these buyers are more accurate in recalling previously encountered prices than those who do not anticipate such a need. Although not hypothesized, the results show that anticipation of a later need of price information improves buyers' recognition accuracy as well.

Third, overall, buyers are more successful in recognizing previously encountered prices than they are in recalling them without the help of external cues. Methodologically, this implies that recognition accuracy is a superior measure of buyers' price knowledge than recall, provided however that their learning and choice task orientations are comparable.

Finally, when buyers are preoccupied with remembering a specific price, their attention is focused on the to-be-remembered price, so much so that they are unable to consider the expensiveness of the item relative to other items with the product category. Also, when buyers use unit price information, they usually rank the expensiveness of different prices on the basis of unit prices rather than their item prices.

#### SIGNIFICANCE OF THE PROPOSED RESEARCH

This research contributes to the marketing knowledge at the conceptual, substantive, and methodological levels. At the conceptual level,

a theoretical foundation has been developed that could guide future research in price awareness and price perceptions. Practitioners are likely to benefit as well by understanding the determinants of price awareness and recognizing the fact that the manner in which prices are learned differ across shoppers depending upon their need for the information and the nature of choice tasks they perform during the purchase decision process. At the methodological level, it is argued that a single measure of recall is incapable of assessing buyers' price awareness and therefore different memory tests need to be used to tap different levels of encoding of price information. These issues are expanded below.

### Theoretical Knowledge

It has been long recognized by price researchers that buyers do not perceive price information in a similar manner (Monroe 1973). Also, it is the perceived (or subjective) price and not the actual (or objective) price that is encoded in buyers' memories and eventually guides their purchase decisions (Jacoby and Olson 1977; Olson 1980). Despite these arguments, previous price awareness research has generally assumed a single memorial representation in the form of exact price in buyers' minds and has used exact price recall as a measure of price awareness. This research uses theories of human memory and learning to argue for using different memory tests to tap the appropriate encoding.

The other important theoretical contribution of this research is that it identifies psychological variables that can explain variations

in buyers' price perceptions better than shopper demographics, point-of-purchase behavior, and product and store characteristics which have been typically used in price awareness research. Few previous price awareness investigations could provide theoretical justifications as to why these variables might influence the differences in shoppers' price recall accuracy.

Third, price researchers have generally agreed that buyers possess perceptual reference prices that serve as adaptation levels when judgments about newly exposed prices are made (Monroe 1973; Monroe and Petroshius 1981; Helgeson and Beatty 1985). However, it is unclear as to how such references are formed (Monroe 1973). Last price paid (Uhl 1970; Winer 1986) and price most frequently charged or normally paid (Olander 1970; Gabor and Granger 1966) are usually considered to have important influence on buyers' formation of reference prices. It is argued in this research that the extent the last price paid can produce a stable or lasting memorial representations will depend upon the buyers' learning plan and the relative importance of price in the choice decisions. It is possible that for buyers making purchase decisions based on non-price factors may pay little or no attention to prices and therefore the prices they pay may not have much impact in formation or adaptation of reference prices.

At the methodological level when buyers' ability to recall is used to assess the existence of reference prices, the results may lead to erroneous conclusions because on many occasions buyers may be able to recognize previously paid prices when such prices are presented to them even

though they may not be able to accurately recall those prices. Also in some situations, buyers may neither recall nor recognize the prices paid but they may have a fairly accurate idea about the rank of the item's price relative to other prices.

Finally, this research raises some fundamental issues that may have important implications for economic theory of buyer behavior in relation to price. Echoing the concern of Brown and Oxenfeldt (1972), this research argues that buyers may not perceive prices as accurately as the economic theory suggests because of their motivational or choice task-related factors. Widespread "misperception" such as this may result in imperfections in the functioning of the market which may have adverse consequences in the welfare of buyers and sellers, two important participants in the economic system (Brown and Oxenfeldt 1972).

### Managerial Implications

Managers are often confronted with making sound pricing decisions. While economic theory provides some aggregate level guidelines about setting prices, the economic models are not designed to describe realistically the way firms make pricing decisions or the way consumers respond to those decisions (Nagle 1984). From the demand side, if consumers differ in the way they learn or perceive the same objective prices, then it is imperative for price setters to take notice of these differences especially in an environment that uses price as one of many demand stimulating devices. Several key issues have been addressed in this research

that could be of importance for managerial decisions. First, this research finds that shoppers employ different cognitive strategies for learning or remembering price information depending upon their anticipated need for the information and the nature of choice criteria they use during their purchase decisions. Second, given the different learning strategies and choice task orientations, shoppers were found to be able to learn prices differently. Some shoppers remember the exact prices, others may differentiate items in terms of their relative expensiveness, yet others may be able to recognize only when the previously exposed prices are presented.

These issues are also likely to serve firms and retailers in developing appropriate pricing, positioning and merchandising strategies on the basis of shoppers' sensitivities to price as well as price changes. For example, when a segment of shoppers perceives prices not in the form of exact prices but in terms of expensiveness in relation to the leading brand prices, firms must take into account this factor in pricing and promotional decisions. Also, when a segment of shoppers does not pay much attention to price, but is more interested in other non-price factors, then providing deals and other price inducements to this segment may not be very effective.

## OVERVIEW OF CHAPTER II

The next chapter begins with a discussion of some important issues in the behavioral pricing literature that have direct implications for

this research. The chapter then reviews past empirical investigations in price awareness and delineates the state of knowledge generated from this research stream. Finally, this chapter develops a conceptual model and reviews literature on human memory and learning to propose theoretical propositions for this research.

#### OVERVIEW OF CHAPTER III

Chapter III converts the theoretical propositions into operational hypotheses and discusses the methodological issues for carrying out a laboratory experiment. The details about the proposed research designs, operationalizations of variables, sampling plans and experimental procedures of analysis are presented. The pre-experimental procedures and their impact on development of instruments are also enumerated.

#### OVERVIEW OF CHAPTER IV

Chapter IV analyzes the data collected in the experiment and presents the results. It begins with the assessment of the strengths of experimental manipulations. Individual hypotheses are then tested. Analyses regarding the impact of potential confounds are also carried out to eliminate the possibility of alternative explanations.

## OVERVIEW OF CHAPTER V

Chapter V assesses the substantive issues stemming from the research results. The strengths and limitations of the study are highlighted. Possible extension and future research opportunities are identified.

## SUMMARY

Previous research shows that even though price is assumed to be an important criterion in buying decisions, buyers, when asked, have considerable difficulty in recalling prices of previously purchased items. It is argued that such results may not be necessarily due to lack of price information in buyers' memories but these may be cases of retrieval failure due to insufficient cues. In order to address this issue, it is suggested that buyers' learning of price information is influenced by their learning plans and the nature of tasks they perform during their choice process. Because of the differences in motivational and task factors, buyers tend to encode prices differently and different cues that are compatible to the original encoding are necessary to facilitate retrieval.

The research hypotheses developed in this research were tested in a laboratory experiment where the learning and task factors were suitably manipulated. Subjects' learning of price information were measured through three memory tests: recall, recognition, and relative recall. The scores of these tests were used for testing the hypotheses.

The research provides a theoretical foundation for price awareness and price perception research and opens up possibilities of new research within the domain. Given the support of the hypotheses, the research may raise some fundamental questions for economic price theory.

Practitioners are likely to benefit from this research as well, by understanding the determinants of price learning and recognizing the fact that buyers encode prices differently depending upon their internal motivation as well as the nature of tasks they perform during their purchase decision process.

## CHAPTER II

### REVIEW OF LITERATURE

#### OVERVIEW

One of the critical assumptions in economic theory of buyer behavior is that buyers must not only have accurate knowledge of specific prices of the products they purchase, but they also must know the prices of all other products that potentially can contribute to their utilities (Marshall 1920). This assumption has been questioned by price researchers on both empirical and theoretical grounds (Gabor and Granger 1961; Emery 1969). Past research shows that even though price is assumed to be an important criterion in buying decisions, a large number of buyers, when asked, could not recall the correct prices of previously purchased items (Gabor and Granger 1961; Progressive Grocer 1964, 1974, 1977; Allen, Harrell, and Hutt 1976). This finding has led some researchers to infer that perhaps buyers do not pay much attention to prices during their buying decisions (Gabor and Granger 1961; Progressive Grocer 1964, 1974, 1977).

Other researchers, however, have argued that buyers do not learn and retain in their memories the prices of numerous items they purchase for two reasons. First, buyers' limited cognitive capacity does not allow for processing and storage of such vast amounts of information (Jacoby

1977; Jacoby, Speller, and Kohn 1974a, 1974b). Second, the shopping setting provides the necessary information, including price, that is usually sufficient for making a purchase decision (Dickson and Sawyer 1986).

While both arguments are valid, it appears that if prices are to serve as important purchase decision criteria, buyers should have some memorial reference of price in order to be able to make meaningful comparisons in shopping situations and thereby make a choice (Emery 1969). In fact, evidence has emerged confirming existence of reference prices in buyers' minds serving as adaptation levels when making judgments about prices. However it remains unclear as to how buyers perceive the prices that they are exposed to and how reference prices are formed (Monroe 1973; Olson 1980).

Perception is the process by which an individual organizes, interprets, and gives meaning to a given stimulus (Monroe and Petroshius 1981; Helgeson and Beatty 1985). Researchers suggest that an individual, once exposed to a stimulus, goes through the process of attention, comprehension, and retention of the stimulus information in memory (Assael 1984; Helgeson and Beatty 1985). Thus, it is not the stimulus alone that determines whether or how it will be perceived; the perceptual process is also influenced by the interest, needs and values of the individual who is exposed to the stimulus (Berkman and Gilson 1978). Therefore, in the context of price, these individual factors determine the strategy that buyers use in attending to and encoding of price information for later use (Helgeson and Beatty 1985; Bettman 1979b). Moreover, the perceptual

process is also influenced by a number of contextual and task-related factors confronting the buyer during the purchase situations (Monroe 1977; Bettman 1979b). The choice tasks that require usage of price information are likely to produce a more stable memory trace in buyers' mind than the tasks that distract buyers from price information (Bettman 1979b).

Given this background, the two fundamental questions that this research seeks to answer are: (1) how do buyers learn price information during their buying process and encode the information in their memories? and (2) what effects do buyers' motivational and task-related factors have on such learning and encoding process?

In order to address these two issues and to provide a conceptualization for this research, this chapter is organized in five sections. The first section reviews consumer information processing and related memory literature to identify the cognitive functions that are considered important for this study. Specifically, the roles of encoding, storage, and retrieval functions in making inferences about buyers' knowledge of price information are examined.

The second section reviews relevant literature to identify important factors that influence buyers' memory processing and learning of price information. This section suggests that buyers' learning of price will be influenced primarily by two factors: (1) their intention (or the lack of it) to learn the information depending upon their relative reliance on internal or external memories, and (2) the nature of tasks that shoppers perform during the choice process.

The third section describes the different memory tests for retrieval of stored information in memory. In brief, what this section brings out is that buyers usually encode or guide their learning plans in anticipation of a retention test. Apart from the expected retention test, buyers' encoding process will also be affected by the nature of choice tasks they perform. Because of the differences in learning plan and choice task-related factors, buyers are likely to perform differently in different memory tests.

The fourth section integrates the literature reviewed in the earlier sections to generate several theoretical propositions involving relationships between recall and recognition test performances and buyers' motivational and task-related factors.

Finally, a summary of Chapter II is presented and basic theoretical issues involved in this research are highlighted.

#### CONSUMER PROCESSING OF PRICE INFORMATION

When buyers perceive price to be an important factor in their purchase decisions, they make some effort, conscious or unconscious, to gather price information from various sources and retain the information in their memories for later use (Olson 1980). Therefore, the research involved in understanding buyers' responses to price necessarily requires investigation of the cognitive dimensions of buyers and use available theories of human memory to provide a conceptualization of the research

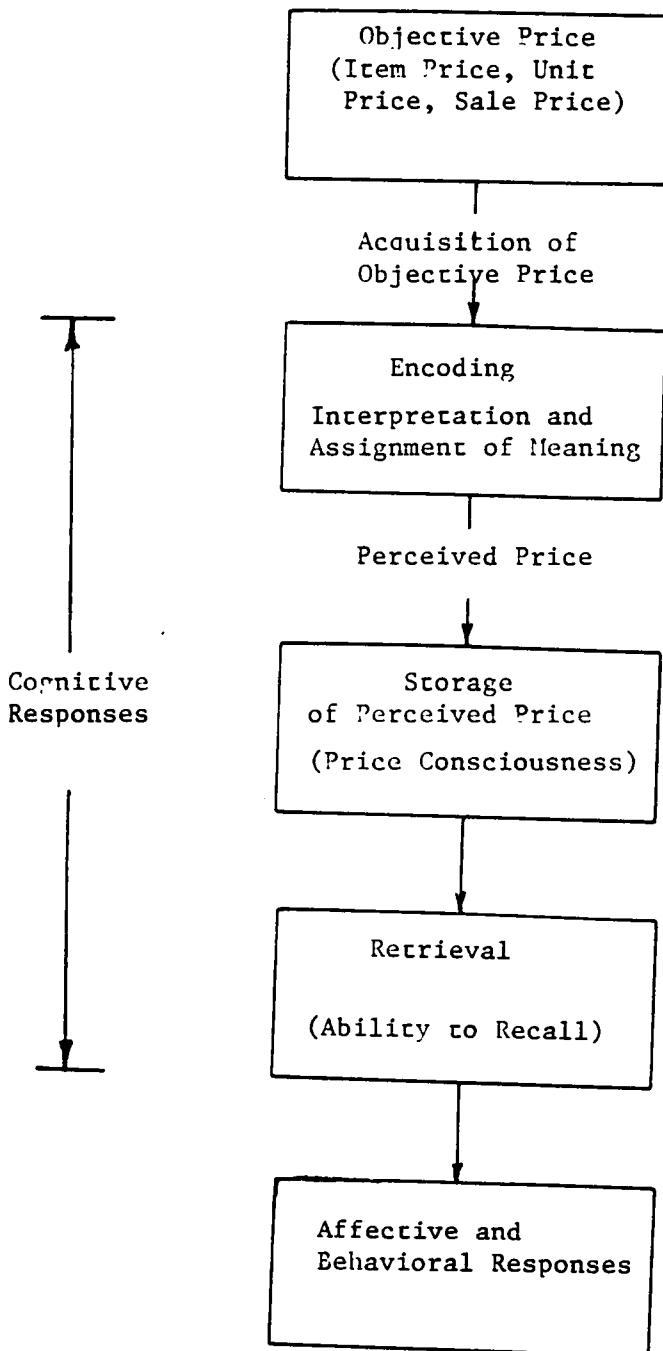
(Cooper 1969; Monroe 1973; Monroe and Petroshius 1981; Jacoby and Olson 1977; Olson 1980).

#### Jacoby and Olson's (1977) Schema

Jacoby and Olson (1977) provided a conceptual framework for explaining consumer reaction to price from an information processing perspective. An adaptation of the Jacoby and Olson's (1977) schema is presented in Figure 1. According to the model, buyers after being exposed to price performs three sequential memory operations: encoding, storage, and retrieval.

Encoding refers to the mental process by which external information is transformed into a meaningful representation (Murdock 1982). Thus, buyers after acquiring the price information interprets the objective stimulus in a meaningful manner. The meaning however resides in the assessment of that stimulus by the individual, in how the individual interprets the stimulus, rather than the stimulus itself. Thus, the meaning of a stimulus is human construction depending upon the individuals' view of current context to events (Bettman 1979b). For example, a buyer comparing prices of two items at the point-of-purchase may encode the information as one item being more expensive than the other rather than encoding the exact prices of the two prices (Zeithaml 1982). Also, buyers may categorize prices as being 'too high' or 'too low' rather than encoding the exact physical prices.

**Figure 1**  
**A Conceptual Model of Consumers' Reaction to Price**



Source: An adaptation from Jacoby and Olson (1977)

Thus, the ways buyers encode price information may or may not be isomorphic with the physical price, depending upon how buyers interpret and assign meaningfulness to the stimulus. Understanding of the encoding process is therefore critical because it is the form in which buyers encode or perceive price information, and not necessarily the physical or objective price, that influences buyers' purchase decisions.

Storage refers to the persistence of information in memory over time (Murdock 1982). The information which is stored only at sensory or short-term memory is lost rapidly. However, the information that finds its place in the long-term memory is associated with other bits of information (Craik and Lockhart 1972). For example, price may be associated with the brand names, store names, and prices of other brands. Jacoby and Olson (1977) equated longterm storage of price information with price consciousness.

Retrieval is the process by which an individual utilizes the information stored in memory when such a need arises (Murdock 1982). Unfortunately, the Jacoby and Olson's (1977) schema does not provide a comprehensive description of the retrieval function. However, they argue that for most buyers, the encoded prices may not be isomorphic with the objective dollars and cents prices and therefore, many buyers fail to recall prices. Therefore, failure to recall may not provide a conclusive evidence that the price information is not in store (Jacoby and Olson 1977).

### Helgeson and Beatty (1985) Extension

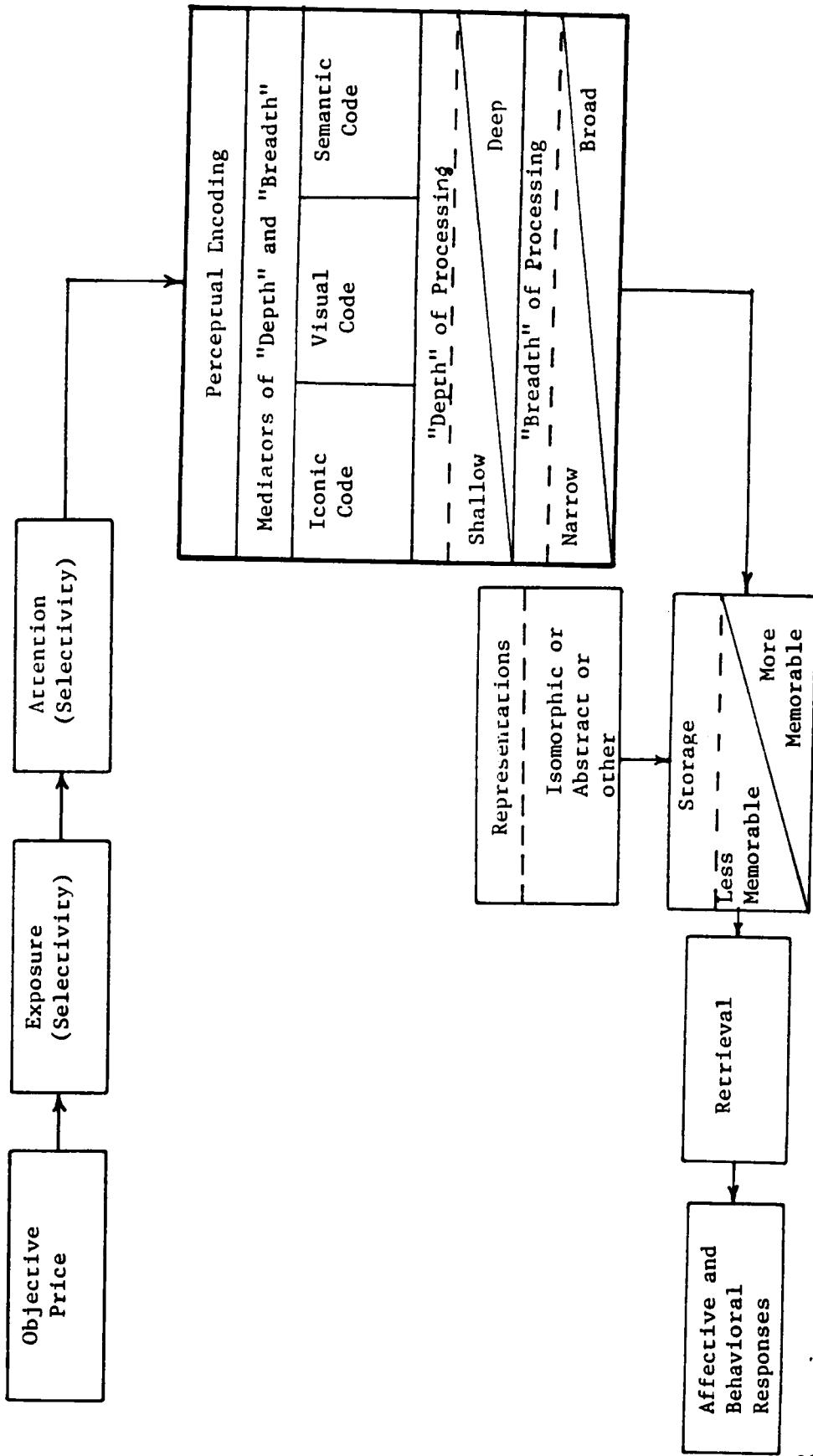
Maintaining the same hierarchical view of information processing, Helgeson and Beatty (1985) Jacoby and Olson's (1977) information processing schema, in three important ways (Figure 2). First, Helgeson and Beatty (1985) identified two antecedent factors, exposure and attention, mediating the encoding process. Second, the encoding process has been explained in the context of lengths and breadths of processing of information. Finally, the model provides a more comprehensive description of the retrieval function. These issues are addressed next.

#### **Exposure and Attention**

Even though price is one of the most ubiquitous form of product information and presents consumers with many exposure opportunities, the extent to which buyers are actually exposed to such information depends upon their goals and motivations (Bettman 1979b). Buyers are usually selective in what they want to be exposed to. For example if a buyer's goal is to find out which brand is on sale today, the buyer is selectively looking for the price tags marked 'sale' or 'special' disregarding the 'regular' prices of other brands. Like exposure, buyers are selective in providing attention to a myriad of price and non-price information that they are exposed to. Selective attention involves picking up certain information and leaving the rest unused (Seamon 1980). The main reason why shoppers attend to price information selectively is because they have

**Figure 2**

**Helgeson and Beatty's (1985) Schema of the Processing of Price Stimulus**



limited cognitive capacity and therefore, they make a perceived cost-benefit trade-off in deciding which information should be given more attentional capacity (Kahneman 1973). Clearly, this decision is guided by shoppers' task goals (Bettman 1979b). For example, a health conscious shopper desiring to buy the most nutritious food items may provide attention only to the nutritional and calorie information and disregard the price information. Also, a price conscious buyer may pay a close attention to prices and weights of a number of alternatives before making a purchase decision.

While important, goal directed allocations of attentional capacity are not the only influence on selective aspects of attention. Attention is also allocated to events in the environment which are surprising, novel, unexpected or potentially threatening (Bettman 1979b). Kahneman (1973) calls this type of attention involuntary, in that it is a function of more automatic, built-in mechanisms, rather than guided by a current goal. For example, a shopper having no plans for buying a particular item notices that the price of that item is reduced to half of its regular price. This unusual price reduction may induce the buyer to provide attention to the event regardless of the shopping goal.

### Encoding

Using the levels of processing view (Craik and Lockhart 1972), Helgeson and Beatty (1985) suggest that the manner in which price information will be encoded and how memorable this information will be is de-

terminated by how deeply or how broadly the information is processed. As discussed later, the depth of processing is determined by the extent to which meaningfulness is extracted from stimulus information. At the physiological level, the initial memory for a visual stimulus produces an iconic trace which usually lasts for only a brief period of time (Lachman, Lachman, and Butterfield 1979). Initial visual contact with a price stimulus can produce this type of iconic image and unless shoppers provide specific attention to the stimulus information, the information finds no place in buyers' memories.

According to Helgeson and Beatty (1985), processing at an intermediate depth is carried out when a visual code is recorded of the physical features of the stimulus, e.g., the literal numeric symbols representing a price. This code may be rehearsed to assure its place in memory. Possible outcome of this type of processing could be: (a) remembering exact prices, (b) remembering only the first digit of the price, or (c) whether or not the numeric price had a specific digit.

Processing at a still deeper level involves assigning meaning to price stimuli, known as semantic processing. Some of the outcomes of semantic processing could be: (a) broadly categorizing brands in terms of price, e.g. expensive, average-priced, inexpensive, or high-priced - low priced (Olson 1980; Zeithaml 1982, 1984), (b) classifying a price relative to the price of a reference brand, e.g., more expensive - less expensive than brand A, (c) assigning some quality meaning to the price (Tull, Boring, and Gonsior 1964; Monroe and Krishnan 1985), and (d) categorizing the brands in terms of affordability.

Breadth of processing refers to the number and types of traces produced during the encoding process (Anderson and Reder 1979). Thus, the degree to which the stimulus information is elaborated and is associated with other information during processing will determine the processing breadth. Elaboration occurs when interconnections among different concepts or information are produced through an associative network during processing. For example, a shopper, intent on making a 'best buy' decision, considers different pieces of information like package size, brand names, nutritional information along with prices of the brands. This type of processing creates linkages between the price and other pieces of information.

### **Storage or Memory**

According to the model, storage and encoding are closely intertwined. Thus, greater depth and breadth of processing of price information will result in greater memorability of the information.

### **Retrieval**

According to Helgeson and Beatty (1985), price information is assigned meaning before it is stored in memory. Stimuli obtain meaning by being linked to other concepts of information that are similar to them. This linking process actually builds a network of information in memory and is called a propositional network. If a stimulus is linked to se-

mantic concepts, greater depth of processing occurs, and the more concepts to which a stimulus is linked the greater the breadth of processing (Helgeson and Beatty 1985). Price can be linked or related to many concepts such as brand name, value, quality, and social status. In addition to this, the nearer a concept is to another in the network, the more memorable it will be when the first concept is brought to mind.

Although an item may be stored in the propositional network in memory, it is not always easily accessible. Retrieval of information is enhanced by the number of links to an item in propositional networks in memory, the strength of the relationship between items in memory, and the general depth and breadth of processing (Helgeson and Beatty 1985). Retrieval of information is brought to active memory (out of storage) through a process of spreading activation (Collins and Loftus 1975):

"This spread of activation has been compared to the flow of electrical current through a wiring system. The various facilitators of memory retrieval, in a sense, reduce the resistances in the wires (i.e., the links). Some pathways through the propositional networks are much more readily traveled. The persistent covariance of price and quality in the minds of consumers may be an example of a readily activated, much traveled (low resistance) pathway between two concepts." (Helgeson and Beatty 1985, p. 4)

In summary, the Helgeson and Beatty's (1985) model suggests that even though price information is widely available from sources external to shoppers' memories, their exposure to this information, the degree to which they attend to the information, and how deeply and elaborately they process this information will differ across shoppers. Because of these differences, buyers are likely to encode price information differently and therefore, will not perform equally well in different retrieval tasks.

For some shoppers, the memory functions do not go beyond the initial exposure of external price stimuli and therefore, it is unlikely that price information will find a place in memories of these buyers. But for other shoppers, price information may be processed at different levels of depth and at different degrees of elaborations. Such differences would produce different memory traces and different kinds of associative linkages with other information. Therefore, different memory tests would be necessary to retrieve price information from buyers' memories.

#### Theories of Human Memory

It may be clear from the above discussion that research involving buyers' price knowledge requires a clear understanding of the three important memory functions--how buyers encode and store price information and what processes are involved in retrieval of such information. While the Jacoby and Olson's (1977) information processing schema and Helgeson and Beatty's (1986) extension identify and explain the three important functions, review of the relevant theories of human memory would be useful in understanding the possible linkages among these functions in the context of price information.

#### **Structural View**

According to the structural view, a memory system can be divided into three principal storage structures, each corresponding to a stage of

processing of a given stimulus (Atkinson and Shiffrin 1968). In the first stage following stimulus presentation, some information enters the sensory register which is so called because information enters through one or more of the five senses and is held in sensory form for only a very brief period of time. The longer the information sits in the sensory register, the weaker it gets until it is lost completely. In case of a visual stimulus (like price information at the point-of-purchase), an iconic trace is produced at the physiological level of memory as soon as an eye contact with the target information is established. This trace usually lasts for about one second and most of the useful information deteriorates by 0.3 second (Lachman, Lachman, and Butterfield 1979). That is, initial visual contact with a price stimulus produces an iconic image and unless shoppers try to extract meaning from the stimulus, the information is permanently lost from sensory store.

Loss of information from the sensory register can also take place due to interference from other incoming information (Adams 1980). For example, after initial visual contact with a price information, shoppers may turn their attention to the brand name or nutritional information or the price of the next item on the shelf. In this case, even though the shoppers are technically exposed to price, the information is displaced as soon as the visual contact is broken.

The second storage in memory in the Atkinson and Shiffrin's (1968) model is short-term memory which is also referred to as primary memory, immediate memory, or working memory. Some researchers have also equated short-term memory with consciousness (Klatzky 1980). Short-term memory

does not store information in raw sensory form. When information about the stimulus is in the sensory register and before it is passed on to the short-term memory, an important component comes into play. It is known as "pattern recognition", a complex process of matching incoming sensory information with previously learned information stored in long-term memory. Thus, the contents of short-term memory is something meaningful. Short-term memory is a temporary store of limited capacity, but not as temporary as sensory register. The limited capacity of short-term memory is commonly called the memory span and is defined as the number of items that can be recalled without error (Atkinson and Shiffrin 1968). Researchers maintain that about 7 items is the normal short-term memory span and these many items can be recalled without error (Miller 1956; Murphy and Puff 1982). However, additional information can be stored in short-term memory with the help of rehearsal (Klatzky 1980).

The third component, long-term memory, is considered a permanent store house of information interconnected by a network of associative pathways (Anderson and Bower 1973). However, some researchers have argued against the permanent property of long-term memory on the ground that individuals sometime fail to remember things they had known before. Although, Atkinson and Shiffrin (1968) recognized the possibility of decay, interferences, and loss of strength in long-term store, the supporters of the permanency hypothesis contend that forgetting of information in long-term store is a retrieval problem and not a decay phenomenon (Murdock 1982). An alternative explanation of people's inability to remember past information was provided by activation theorists (Collins and Loftus

1975) who contend that even though the information is in the memory, only a small portion of it can be activated at any one time. This view is akin to the notions of effort people allocate in the retrieval task (Kahneman 1973).

In summary, the structural view suggests that encoding and storage are two sequential operations. In this view, once individuals perceive the need for storing information, they provide meaning to the incoming stimulus and store it in the short-term memory. The information then moves from short-term memory to long-term memory with the help of rehearsal. Thus storage can take place both at short-term memory as well as at long-term memory. However, the storage at short-term memory is temporary in nature and the information decays quickly unless it is rehearsed. The information in long-term storage is permanent and is never lost or decayed. Retrieval from short-term storage can be carried out directly. But when information needs to be retrieved from long-term store, appropriate retrieval procedure is necessary to activate the search and detection process through the associative network in long-term memory.

While the multiple-store view provides a foundation for memory research, it has two important limitations. First, it is unclear as to what kinds of processing is involved when information is transferred from a short-term to a long-term storage. Second, the model does not explain the linkage between encoding and retrieval in that it does not provide a guideline as to the kinds of cues necessary to activate the network or whether there is a possibility that individuals encode information in

anticipation of some retrieval task. Some of these limitations have been addressed by the levels of processing view of human memory.

### **Levels of Processing View**

According to the levels of processing view (Craik and Lockhart 1972), memory is thought of as the product of the kinds of analyses, or "processes" performed on the information by individuals who receive it from external sources. There are three fundamental tenets of the processing view of memory. First, memory is viewed as an information processing system which analyzes the stimulus information. The different manner in which an individual analyzes or processes information can be viewed as forming a dimension called level (or depth) of processing. The processing can be roughly divided into three levels: sensory level (analyzes the physical properties of a stimulus), acoustic level (identifies and names the stimulus), and semantic level (provides meaning to the stimulus).

Second, these three types of processing can be hierarchically ordered in terms of the depth or elaborateness of processing. Sensory or physical processing produces the "shallow" memory trace or code (which is a record of what processes have been carried out to analyze the stimulus); the acoustic or naming process produces memory code of intermediate depth; and the semantic processing produces the "deepest" code.

Third, deeper codes are more enduring than the shallow codes in terms of retention. Forgetting or decay, then is a function of the depth of

processing. Shallow codes are forgotten quickly, while deeper codes could be retained for a long period of time.

The hierarchical ordering of processing and corresponding depth of memory code in the levels of processing view closely resembles the structural views in terms of the functions that different memory storages performs (Klatzky 1980). Both models agree that information can be coded at a sensory level, acoustic level and semantic level. However, in the levels of processing framework, how deeply an event or information is coded in the memory is not dependent on which store contains the information. It depends instead on what an individual does with the stimulus information, how it is analyzed, and what codes are created by these analyses (Wingfield and Byrnes 1981). Thus, under the levels of processing framework, encoding and storage are intertwined and inseparable. At a shallow level of encoding, information will not be retained in memory for a long period of time, while a deeper encoding process permits information to be retained for a fairly long time.

As regards retrieval of information from memory, the levels of processing view is similar to the structural view. However, the processing view suggests that in order for retrieval to be effective, the cues provided for retrieval should be compatible with the manner in which information was encoded and stored so as to trigger activation of the associative linkages in memory (Collins and Loftus 1975). This view of information retrieval from human memory has been formalized by Tulving and Thomson (1973) as the "encoding specificity principle".

### Encoding Specificity Principle

The encoding specificity principle suggests that "a retrieval cue is effective if its informational content matches and complements the information contained in the trace of the to-be-remembered events" (Wiseman and Tulving 1975, p. 371). The initial processing of to-be-remembered stimuli leads to a specific encoding; the subsequent presentation of a retrieval cue either in form of a memory test or for facilitating some decision also leads to a specific encoding. Retrieval performance depends upon the overlap or similarity of encoding processes at presentation and at retention test (Eysenck 1977). In other words, if a retrieval cue fails to be encoded at test in a manner approximating the encoding of the to-be-remembered items, then it will prove ineffective.

According to this view, failure to retrieve previously stored information can be explained in two different ways: (1) a storage deficit, in which there is a loss of information from memory, or (2) a retrieval deficit in which the information remains in store, but the retrieval environment does not suffice to gain access to the information (Eysenck 1977). In general, previous researchers in price awareness have accepted the former explanation and have concluded that since buyers do not perform well in recalling previously paid prices, perhaps buyers do not store the information in their memories. However, using the encoding specificity principle, it can be argued that much of buyers' inability to recall prices could be attributable to the lack of correspondence between the manner in which prices were encoded and the cues presented during the

retrieval process (Thomson and Tulving 1970; Tulving 1974; Eysenck 1977; Murdock 1982).

An immediate difficulty with encoding specificity principle lies in making a priori assessment of the original nature of encoding and in specifying how great an overlap between original encoding and retrieval environment is needed for successful memory performance (Eysenck 1977). While making an independent assessment of original encoding is admittedly problematic, researchers suggest that information is usually encoded with some retrieval task in mind. Thus, there exists a two-way relationship between encoding and retrieval. On one side, successful retrieval requires providing cues that are compatible with the original encoding. But on the other side, the manner in which individuals encode information may depend upon their anticipated retrieval task (Eagle and Leiter 1964). Therefore, a correspondence between anticipated and actual retrieval task is necessary for successful memory performance.

For example, when buyers are only interested in knowing whether an item is more expensive than another, they would tend to encode the information in a manner that would facilitate such comparison. Also, when buyers anticipate that the required price information will be available externally, they may not make an effort to memorize the information for later recall; but they may be able to recognize the price when it is presented externally. Finally, when buyers anticipate that the required price information may not be easily available externally, they may encode the information for later recall even though they may not be able to re-collect whether the price was more or less than that of another item.

These issues have been addressed in greater details later in this chapter in the context of intentional and incidental learning.

### Integration of Conceptual Issues

The review of Jacoby and Olson's (1977) schema, Helgeson and Beatty's (1985) extension, and the different theories of human memory brings out several issues that are important for this research. First, the fact that short-term or immediate memory has limited capacity explains selectivity of individuals in exposing themselves and attending to external information (Seamon 1980). In the context of price, even though price information is widely available, whether or not buyers will be exposed to them, the amount of attention they will provide to these stimuli, and the manner in which they will encode the information will depend on their decisions to allocate their limited cognitive capacities to these stimuli (Bettman 1979b). The major factor that influences the allocation processes buyers' perceived need for storing the information and the way they want to use the information.

Second, the storage and encoding processes are closely intertwined. The manner in which price information is stored will depend upon the extent meaningfulness is extracted from the stimulus, how elaborately the information is processed, and what kinds of associations between price information and other information are formed as a result (Wingfield and Byrnes 1981).

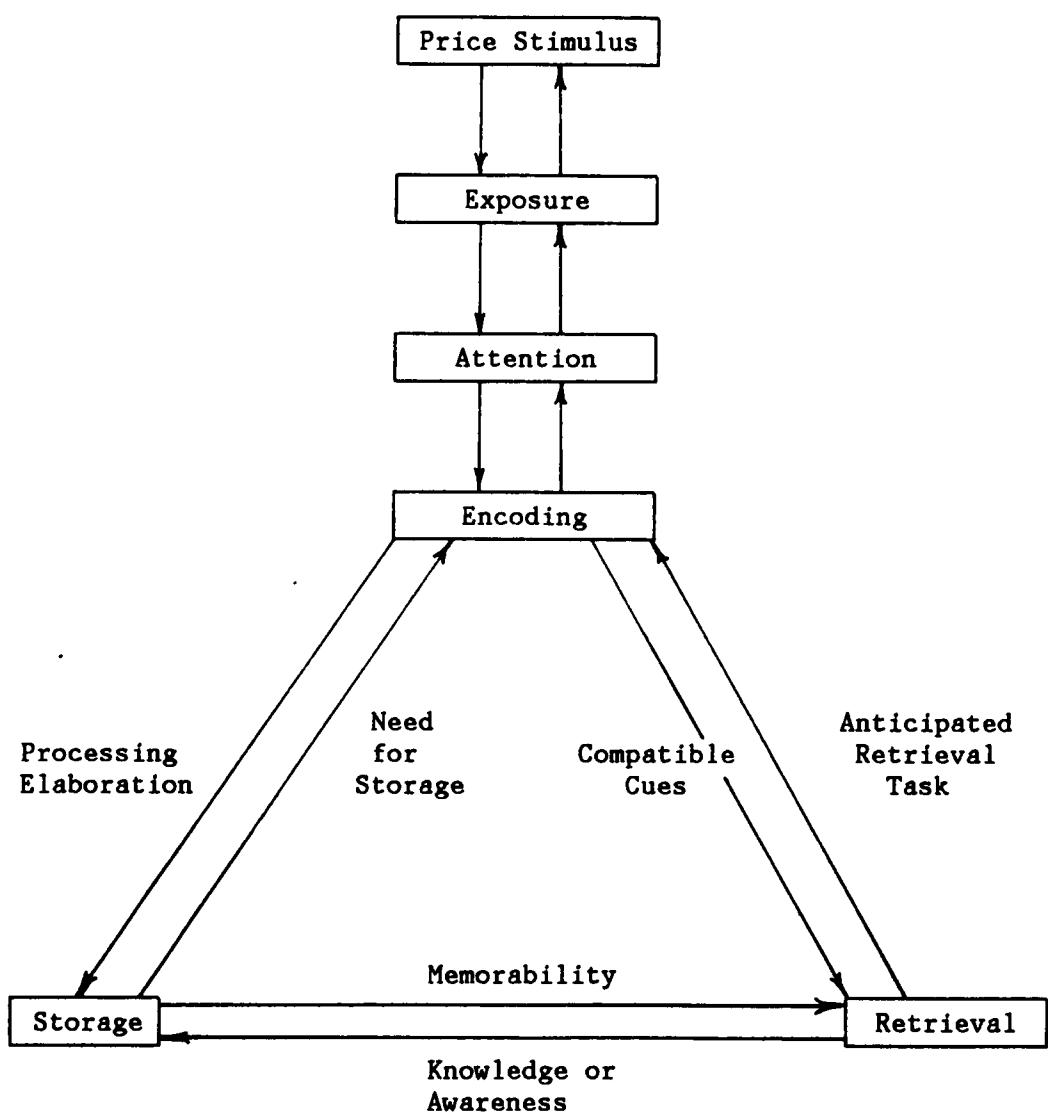
Third, encoding of information is usually done in anticipation of some retrieval task and the corresponding learning strategy buyers employ in relation to the price information (Bettman 1979b).

Finally, the extent to which buyers will be successful in retrieving price information depends upon the compatibility between the retrieval cues provided and the encoding process which occurred during the initial encoding. If the initial encoding is semantic, the cues that facilitate semantic retrieval process will be more effective; alternatively, if the encoding is sensory, other retrieval cues will be necessary (Lockhart, Craik, and Jacoby 1976; Zeithaml 1982).

These four issues have been integrated in the conceptual model (Figure 2-A) which will serve as a conceptual basis for this research. The model suggests that the three memory functions, encoding, storage and retrieval, may be better characterized as an inter-related system rather than viewing them as sequential operations.

According to the proposed model, encoding (and its antecedent factors: exposure and attention) is guided by buyers' need for storing the price information and the manner in which they expect to retrieve it when such a need arise. Second, the elaboration (depth and breadth of processing) during the encoding process determines whether the information will be stored at a sensory level or whether it will be associated with other information in a more meaningful manner. Third, the cues that are compatible with original encoding will lead to a more successful retrieval than cues which are unrelated. Finally, the success or failure in dif-

**Figure 2-A**  
**Conceptual Model of this Research**



ferent retrieval tasks may be used to make a judgment (although not conclusively) about buyers' knowledge or awareness of prices.

Having proposed the conceptual model, it would be useful to identify the factors that may influence each of these three memory functions. The next section will address this issue.

#### DETERMINANTS OF PRICE AWARENESS AND LEARNING

The review of memory literature presented in the previous section clearly indicates that examination of buyers' cognitive dimensions is an imperative for understanding how buyers encode and store price information in their memories and what processes are involved when buyers attempt to retrieve this information. However, previous research in price awareness has generally ignored the consumer information processing perspective and primarily has relied upon factors relating to shopper demographics, manifest shopping behavior, and product- and store-related characteristics to explain the difference in their retrieval performance (Table 1).

#### Past Research in Price Awareness

Previous investigations in buyers' price awareness have taken one or more of the following theoretical perspectives to identify factors causing differential effects on buyers' retrieval performance of price information (Olson 1980):

1. economic perspective
2. behaviorist perspective
3. managerial perspective
4. cognitive perspective

While the theoretical perspectives presented above are not always mutually exclusive, the guiding assumption underlying the choice of independent variables to explain variations in buyers' retrieval performances differ to a considerable extent.

#### **Economic Perspective**

The economic perspective has generally held the view that buyers have exact price representations in their memories and the variations in exact price recall performance can be explained by buyers' differences in income (Progressive Grocer 1974; Brown 1971; Wilkinson, Mason, and Bonfield 1976; Dickson and Sawyer 1986) or other income-related factors like social status (Gabor and Granger 1961), household size (Brown 1971) and marital status (Brown 1971; Zeithaml 1982). Use of income as an explanatory variable of buyers' price response accuracy is clearly derived from classical demand theory which suggests that income acts as a constraint to buyers' utility maximizing objectives (Samuelson 1965). Thus, the shoppers with low incomes are likely to be more 'price conscious', and therefore more 'price aware' than shoppers with high incomes. Despite this explanation, only two studies (Progressive Grocer 1974; Brown 1971) found a negative relationship between buyers' income and retention test performance involving price (Table 1). Other studies could not find a

Table 1

**Independent Variables and their Relationships with Price Awareness**

N: Negative; P: Positive  
 NS: Negative Significant  
 PS: Positive Significant  
 NR: No Relation

Independent Variables	G&G (1961) (1)	PG (1974) (2)	PG (1977) (3)	Brown (1968) (4)	Brown (1969) (5)	Brown (1971) (6)	A, H&H (1976) (7)	Zeithaml (1981) (8)	Zeithaml (1982) (9)	Z&F (1983) (10)	W, H&B (1976) (11)	Powell (1985) (12)	Conover (1986) (13)	D&S (1986) (15)
I. Shopper Demographics	X													
1. Social Status	X													
2. Age			X (NR)											
3. Income		X (NS)						X (NS)	X (NS)	X (NS)				
4. Education								X (SR)	X (SR)	X (SR)				
5. Marital Status							X (R)		X (NR)	X (NR)				
6. Household Size							X (R)		X (NR)	X (NR)				
II. Shopping Behavior														
1. Buyer vs. nonbuyer														
2. Brand Loyal														
3. Price Concern							X (PS)		X (S)	X (S)				
4. Auto Use							X (PS)							
5. Shopping Freq.							X (PS)							
6. List Use							X (R)							
7. Stores Shopped							X (PS)		X (X)	X (X)				
8. Days in week shopped							X (PS)		X (X)	X (X)				
9. Price Checking														
10. Extensive Shopping							X (R)		X (L)	X (L)				
III. Product Characteristics														
1. Product Type							X							
2. National vs. Private							X							
3. Product Familiarity							X							
4. Freq. of buying														
IV. Store Characteristics														
1. Store Type														
2. Store Location														
3. Price Format														
V. Psychological Factors														
1. Level of Encoding														
2. Encoding Time														
3. Shopping Attitude														
4. Recency														
5. Latency														
6. Serial Position														

G&G: Gabor & Granger PG: Progressive Grocer  
 W, H&B: Wilkinson, Mason and Bonfield D&S: Dickson and Sawyer

A, H&H: Allen, Harrell & Hutt  
 Z&F: Zeithaml and Fuertst

relationship between these two variables (Gabor and Granger 1961; Zeithaml 1982; Dickson and Sawyer 1986). Similarly, household size, marital status, and education were also not found to have a consistent relationship with buyers' price response accuracies.

### **Managerial Approach**

While the economic approach was concerned with establishing relationships between buyers' income and their awareness of the prices they pay, other researchers were looking for more managerially relevant information and attempted to identify product- and store-related factors to explain the differences in buyers' price retrieval performance. The major problem with this approach is that there is usually little a priori theoretical justification as to why some postulated relationships would hold. For example, the findings that a large proportion of shoppers could recall the prices of bread (Conover 1986) or that prices of national brands are recalled better than prices of private labels (Progressive Grocer 1974), appears to be mere empirical regularities offering little conceptual insight. One variable that seems to be theoretically important is shoppers' product familiarity. However, Powell (1985) could not detect a statistically significant correlation between recall or recognition accuracy and product familiarity (Table 1).

As regards store-related factors, three variables have been used by researchers to explain variations in price awareness. These are store types, store locations, and store price formats (Table 1). The first two

variables are clearly atheoretical and as such they have not been able to explain buyers' price recall accuracies. However, a store's price format is an important variable to examine because shelf or item marketing of price constitutes the informational stimulus to the shoppers (Zeithaml 1982). Consistent with earlier results found by Russo (1977) and Russo, Kreiser, and Miyashita (1975), Zeithaml (1982) found that presence of item pricing results in greater exact price recall accuracy while presence of structured list of unit prices assists shoppers in estimating correctly the relative expensiveness of brands within a product category. This result also indicates the differential impact of intra-item (one item at a time) and inter-item (many items at a time) processing due to item pricing versus shelf pricing.

### **Behaviorist Approach**

The behaviorists have generally assumed that buyers' manifest behaviors were representations of their cognitive processes, and differences in overt behaviors could be used to explain buyers' performance in retention tests. Researchers have used a wide range of behavioral variables, from point-of-purchase price-checking behavior to auto use for shopping to even the days on which shoppers go shopping (Table 1). Previous studies show that buyers can recall prices better than non-buyers (Progressive Grocer 1974; 1977) perhaps due to the lack of exposure and processing opportunity for the latter. However, Zeithaml (1982) discovered a negative relationship between brand loyalty and price recall per-

formance. It is possible that shoppers had developed loyalty for certain brands due to non-price attributes, and therefore they did not pay much attention to prices of such brands. The three behavioral variables which are generally seen to have positive relationships with buyers' price recall performance are: buyers' concern for price (Brown 1968, 1971), price checking behavior (Powell 1985; Dickson and Sawyer 1986), and extensiveness of point-of-purchase behavior (Brown 1971; Dickson and Sawyer 1986). Collectively, these three variables represent buyers' motivation to learn prices and the task dimensions that require use of price information for purchase decisions. The results show that the shoppers who are motivated to know the prices they pay and perform choice tasks that require extensive usage of price information are likely to process price information elaborately, thus resulting in a somewhat stable trace of price information in their memories and successful retrieval.

### **Cognitive Approach**

Interesting as these findings are, it seems that the studies undertaken from economic, managerial, and behaviorist perspectives by and large have failed to provide a deeper, and a more causal explanation of consumers' reactions to price. Olson (1980) made a strong argument in favor of using a cognitive approach, involving understanding of information processing dimensions of consumers, for providing a comprehensive conceptual framework for this research stream. However, only a few re-

searchers (Zeithaml 1981; Powell 1985) have investigated buyers' cognitive factors to explain their memory test performance.

Zeithaml (1981, 1982) postulated and found support of the hypothesis that elaborate processing of price information results in semantic encoding; buyers who encode price semantically were also found to perform better in a price ranking exercise than in recalling the specific prices. Zeithaml (1981, 1982) used total shopping time as a surrogate measure of processing elaboration and depth. Powell (1985) and Monroe, Powell, and Choudhury (1986) argued that in a typical grocery shopping situation, buyers do not make an explicit attempt to memorize prices for later recall, and therefore may not perform as well in recalling the prices as they do in a recognition test. Powell (1985) also found that more recently encountered prices are recalled better (recency effect) and that longer response time (latency) is associated with better retrieval performance.

While these two studies (Zeithaml 1982; Powell 1985) have examined the influence of some important cognitive factors on buyers' retrieval performance of price information, effects of other critical memory factors remain to be investigated. Bettman (1979b) identified several factors that may influence consumers' processing of information. In the context of price, some of the important determinants of processing are: perceived importance of price and non-price factors for a given choice task, degree to which reliance is placed on internal and external memory for price information, amount and organization of information held in internal memory, organization and availability of information from ex-

ternal memory, conflicting events occurring during information processing, and a large number of other cognitive factors (Bettman 1979b).

Given that such innumerable interdependent psychological factors may influence buyers' cognitive processing of price information, it is admittedly difficult to isolate a few factors to explain the differences in buyers' ability to retrieve price information from memory (Olson 1980). One meaningful way to cope with this problem could be to identify some super-ordinate factors that can adequately, but obviously not exhaustively, subsume the important dimensions of buyers' cognitive processes in relation to price. One area of inquiry that has addressed the relevant cognitive functions in response to external stimuli pertains to human learning (Adams 1980). Therefore, it may be useful to examine the factors that may influence buyers' learning of price information.

#### Factors Influencing Learning of Price Information

Previous research in verbal learning suggests that the extent to which individuals learn information depends primarily upon two factors: (1) individuals' intention or motivation to learn, and (2) the nature of tasks they perform during the process of learning (Eysenck 1982). The effects of motivational and task-related factors on learning have important implications in understanding how buyers may learn externally available price information.

First, buyers' intention to learn is guided by their individual factors like motivations, goals and values (Deese 1964). For example,

price conscious shoppers may make a conscious effort to memorize prices of some items for making store-price comparison, pre-purchase planning, or for following movements of prices over time. However, other shoppers may perceive that memorizing prices is not worth the cognitive effort and tend to rely on point-of-purchase price information for making a choice. These shoppers nonetheless may have learned price information and may be able to detect at the point-of-purchase whether the prices are the same as what they paid the last time. This difference in buyers' intentions to provide price information a permanent place in their memories will determine the extent to which they will be exposed to the information, the strategy they will employ in attending to the information, and finally, how deeply and elaborately they will process the information.

Second, while individual factors like motivation or intention may affect learning, buyers' learning of price information is also influenced considerably by situational moderator such as the nature of choice tasks they perform during their process of learning (Bettman 1979b). Some shopping tasks may reinforce the learning intentions, but others may distract shoppers from the to-be-learned price information. For example, an economy minded or price conscious shopper may sometimes be confronted with overriding task requirements like completing the shopping in the shortest possible time or finding an item with the lowest sugar content. Despite the intention of these shoppers to check prices carefully, they may not be able to provide sufficient attention to such information. On the other hand, shoppers who usually pay little attention to prices may sometimes be so constrained by their budgets that they would have to

provide greater attention and allocate greater cognitive capacity in processing the price information. In fact, researchers maintain that in presence of a task, the task goal produces a greater impact on learning than the intention per se (Postman 1964).

The impacts of motivational and choice task-related factors on buyers' shopping behavior have been studied by researchers in retail patronage (Carman 1969; Kenny-Levick 1969; Stephenson 1969). Researchers maintain that shoppers employ different shopping strategies and exhibit different point-of-purchase behavior depending upon their motivational factors (Stone 1954; Kenny-Levick 1969; Darden and Reynolds 1971) as well as their overriding task goals (Bettman 1979b; Guiltinan and Monroe 1980). Such differences in shopping strategies influence shoppers' memory processing of price information and their consequent retrieval accuracies.

### A Typology of Shopping Strategies

Guiltinan and Monroe (1980) defined shopping strategies as "sets of activities that reflect the motives and decision processes governing shopping behavior" (p. 745). Shopping strategies include information search behavior (Moschis 1976), store and brand loyalty (Carman 1969), brand strategy (Newman 1977; Bennett and Mandell 1969), and dealing or bargain strategies (Carman 1969). Some shoppers engage in search before and during shopping; others search for low-price alternatives, but do not necessarily shop more frequently, always prepare a shopping list, or check

ads before shopping; yet others seem to be motivated by convenience and do not 'shop around' (Guiltinan and Monroe 1980).

In an attempt to examine how shoppers formulate their shopping strategies and the manner in which they use price and other information, Guiltinan and Monroe (1980) classified shoppers based on their responses in a 38-item attitude, interest, and opinion questionnaire. Table 2, an adaptation of typology of shoppers' overall shopping strategy proposed by Guiltinan and Monroe (1980), provides a description as to how shoppers may differ in terms of providing attention to and the processing of price information. For example, neither the apathetic and mechanistic shoppers nor the convenience oriented shoppers are likely to pay much attention or carry out elaborate processing of price information. However, their degree of processing will be different. The apathetic and mechanistic shoppers inherently dislike shopping and are therefore likely to be distracted from price as well as non-price information. But convenience oriented shoppers are pressed for time and usually rely on non-price factors like brand names and a quick shopping facility for selecting a store and making a purchase decision. If a meaningful association between price and brand or store characteristics is formed, the price information may be retained in the memories of convenience shoppers.

The in-store economy shoppers are unlikely to make an explicit effort to memorize price or non-price information for later recall but usually rely on external memory or point-of-purchase price information. Since these shoppers carry out extensive in-store price comparison and search for deals, it is likely that elaborate processing of price information

**Table 2**  
**A Typology of Overall Shopping Strategy(x)**

<u>Shoppers' Characteristics</u>	<u>Strategy Descriptions</u>
Apathetic and mechanistic shoppers	Possess a negative attitude toward shopping; negative feelings about value or enjoyment of shopping, menu planning; perceive little importance in planning or search activity.
Convenience oriented shoppers	Do not possess a negative attitude toward shopping but look for minimizing shopping time; brand oriented shopping; little pre-purchase planning or in-store search; unwilling to visit unfamiliar stores.
In-store economy shoppers	Do not believe shopping to be an important task; spend little time in pre-purchase planning and comparing different stores. But once inside a store, they exhibit extensive point-of-purchase price checking behavior, compare prices, use unit prices, and utilize store specials.
Home-makers	Believe shopping to be an important task; but place little importance on price or deals; use brand name or other non-price factors for purchase decisions; tend to buy items that provide satisfaction for family, look for quality, and planned menu.
Economy planners	Rely heavily on pre-purchase planning and budgeting; carry out extensive pre-purchase search for low price; use coupons and newspaper ads for deals. Purchase decisions and store selection are done on the basis of price.
Involved, traditional shoppers	Enjoy shopping for economic and other reasons, carry out extensive out-of-store and in-store search for low price alternatives; compare prices of different brands and stores, look for deals and bargains. They are concerned with non-price attributes.

\*An Adaptation from Guiltinan and Monroe (1980)

takes place in memories of these shoppers. However, learning of price information in such a case may not necessarily take place for later recall and therefore, these shoppers may not perform very well in a recall test. But these shoppers are likely to recognize the price if it is presented with other distractor prices and also, they may perform well in ranking the previously encountered brands in terms of their expensiveness.

The shoppers under the homemaker group are involved shoppers in that they consider shopping as an important task to be performed for satisfying the members of their families. These shoppers are concerned with making a purchase decision not so much on the basis of price but more on the basis of non-price factors like brand characteristics, nutritional values, package size, usage pattern, frequency of purchase, storage facilities, and planned menus. These shoppers, because of the nature of tasks they perform, are likely to be distracted from price information and may not have the opportunity to process price information elaborately. Even when homemaking shoppers exhibit concerns for price, learning of the information is only incidental to their choice tasks.

The economy planners rely heavily on pre-purchase planning and budgeting. Much of their decisions about purchases and choice of stores are made prior to the shopping trip. At the pre-purchase planning stage, these shoppers may obtain price information from ads, word-of-mouth or television commercials and may make some decisions about what items to buy, and from which stores. These shoppers, once inside the store, may wish to verify the prices, which implies that recognition of the prices on the shelf takes place. On the other hand, the shoppers, in absence

of such out-of-store information about price, may try to recall the prices they paid the last time they shopped and use the recalled information for their planning purposes. In general, the economy planners are likely to attempt to rely upon their internal memories for information that may therefore guide their learning plans for later recall.

The involved, traditional shoppers consider shopping to be an important and enjoyable task and they carry out an extensive in-store and out-of-store search for low-priced alternatives, compare prices as well as non-price factors of different brands and stores, and look for deals and bargains. These shoppers do pre-purchase planning but are willing to deviate from their original choice if additional price inducements are offered at the point-of-purchase. Convenience of quick shopping does not play a major role in their purchase decisions. Because of their orientations toward obtaining lower-priced alternatives, these shoppers are likely to be very attentive to price and non-price information and will process the information elaborately in order to keep the information in their memories for later use.

The above discussions about the different shopping strategies clearly indicates that the extent buyers may learn about the prices they pay will depend mainly upon two factors:

- (1) buyers' relative reliance upon internal and external memories for price information (guiding their learning orientation), and
- (2) the relative importance the buyers place on price and non-price factors for their choice tasks, (influencing their task orientations).

On the one end of the continuum, buyers may rely predominantly on external sources for price information and may consider price not an important factor in their purchase decisions. The apathetic, mechanistic and the convenience oriented shoppers can be roughly categorized under this group. It is unlikely that these shoppers would pay much attention to prices and allocate much cognitive effort to process price information. At the other extreme, some buyers may place a greater reliance on their internal memories for price information, and at the same time consider prices to be important criteria for choice decisions. The economy-planners and the involved, traditional shoppers can be grouped under this category. It can be expected that these shoppers would carry out elaborate processing of price information, thus producing a stable memory trace for prices they pay.

Clearly, these two factors can be considered as two important determinant of buyers' learning of price information and therefore, are examined in greater details.

#### Reliance on Internal and External Memories

The influence of buyers' reliance on internal memory or external sources for price information on information processing and choice decisions has been examined by Bettman (1979a,b). Following the arguments presented by Bettman (1979b), buyers' reliance on internal and external memories for information can be conceptualized as forming a continuum, with complete reliance on external source for information at one extreme

and complete reliance on internal memory at the other. Obviously, such extreme forms of reliance rarely occur in actual buying situation and buyers often rely on both internal as well as external sources for information. However, the degree to which reliance is placed on one or the other sources may differ depending upon shoppers individual factors as well as the specific choice situations (Bettman 1979b).

In general, when buyers anticipate that information may not be easily available from external sources and when such information is perceived to be important for making a decision, they tend to rely on their internal memories and guide their learning plans accordingly. For example, price conscious or economy-minded shoppers intending to compare prices of some items across different stores are likely to place emphasis on their internal memory because the prices they were exposed to in the previous stores will not be available in the next stores they visit. The plan of learning in this case will be guided by the need for later recall of previously encountered price information.

On the other hand, when buyers believe that all the information they need for making a purchase decision is available at the point-of-purchase, they will likely make little or no effort to encode the information in their memories for later recall (Dickson and Sawyer 1986). In fact, consumer researchers argue that in most grocery shopping situations, shoppers place greater reliance on external memories than on their internal memories for information (Bettman 1979b; Monroe, Powell, and Choudhury 1985; Dickson and Sawyer 1986). However, it would be incorrect to assume that learning does not occur in such situations (Bettman 1979b).

It is only that these buyers encode the information not in anticipation of a recall and perhaps they will need additional cues for retrieval of the information (Monroe, Powell, and Choudhury 1985).

Somewhere in the middle of the above two scenarios, there could be situations where buyers may rely on both external as well as internal memories. For example, shoppers may find from newspaper advertisements that several items that they are interested in buying are on sale at a specific store. If these shoppers were planning to visit a different store (perhaps due to its proximity) and were interested in comparing its prices with the sale prices at the other store, the shoppers may be relying on their internal memories so that they can recall the sale prices for comparison purposes. But if the shoppers were planning to visit the store that is offering the sale prices, they are likely to use both their internal memory as well as the point-of-purchase price information. The learning plan in this case will be guided by the shoppers' intention to recognize the sale prices when they encounter the information again at the store.

Several consumer researchers have examined the effects of these two forms of learning on consumer search and choice behavior (Bettman 1979b; Krugman 1965; Robertson 1976; Biehal and Chakravarti 1983). Traditionally, researchers have dichotomized learning (Postman 1964) and have distinguished between intentional (or directed) learning and incidental (or nondirected) learning (Bettman 1979b; Biehal and Chakravarti 1983).

## **Intentional Learning**

Intentional learning occurs when individuals make a conscious and deliberate effort to memorize information for later use (Loftus and Loftus 1976). As indicated before, this type of learning may take place in shopping situations where shoppers anticipate that the required information may not be easily available from external sources and therefore, attempt to rely more on their internal memories (Bettman 1979b). Intentional learning of prices may typically occur for shoppers who are involved, economy-minded, and price conscious. These shoppers carry out extensive price comparison among stores and out-of-store planning. This is not to suggest that these shoppers do not use external memory or in-store information for choice decisions. But the degree to which they rely on internal memories is greater than those shoppers whose decision processes are predominantly directed by point-of-purchase information.

Methodologically, intentional learning is referred to as the experimental condition where subjects are instructed to memorize stimulus information for responding to a subsequent recall test (Eysenck 1982). In general, the subjects who are forewarned about an impending memory test are found to recall the previously encountered information better than the subjects who were not told about the test. This finding led many researchers to conclude that intentional learning produces a stronger and deeper memory trace than incidental learning (Schwartz and Rouse 1961; Saltzman 1956). However, other researchers argue that what is important about intentional learning is not that it strengthens memory or produces

deep semantic codes but that the prelearning instruction results in constructing a plan to guide subsequent retention tests (Miller, Galanter, and Pribram 1960). A plan is defined as "any hierarchical process in the organism that can control the order in which a sequence of mental operations is to be performed" (Miller, Galanter, and Pribram 1960; p. 16). Learning 'plan' has considerable influence on individuals' performance in different retrieval tasks and therefore, the issue will be discussed in greater details later in this chapter.

### **Incidental Learning**

Several researchers have postulated that individuals can learn about their environment without necessarily consciously allocating much attention (Bettman 1979b). This type of learning is termed differently by different researchers - incidental learning (McLaughlin 1965; Postman 1975), low involvement learning (Krugman 1965; Robertson 1976), or spectator learning (Posner 1973). Researchers argue that most learning of product information at the point-of-purchase is incidental in nature because learning is not the primary processing goal (Bettman 1979b; Krugman 1965; Biehal and Chakravarti 1983).

Incidental learning occurs when individuals do not make a conscious and explicit intent to memorize information for later reproduction (Eagle and Leiter 1964). In shopping situations, product or price information may be acquired and stored in memory while buying products or brands in a store. The processing activity in incidental learning differs from that

associated with intentional learning in two important ways. First, buyers may direct less effort towards encoding price or product information or developing strong linkages among available information. This level of effort implies that less information may be retained and that what is retained may be subject to greater recall error than in intentional learning (Bettman 1979b; Biehal and Chakravarti 1983). Second, during a choice task, buyers may selectively allocate attention and processing capacity on some information but other information may be attended to only cursorily or even ignored (Johnson and Russo 1978).

Incidental learning of price information may take place when buyers find little need to memorize the information for later recall because they anticipate that such information will be easily available from external sources (Dickson and Sawyer 1986). Their learning of price information is only incidental to the choice tasks and is not directed by future needs for recalling the prices. However, the fact that such learning is often associated with poor recall performance may not always mean that buyers have no memorial reference for price information or that the information decays as soon as the shopping task is complete. What is important to recognize is that retrieval of information in an incidental learning situation may need additional retrieval cues (Monroe, Powell, and Choudhury 1985).

Methodologically, incidental learning refers to learning where subjects are not forewarned about a subsequent retention test (Eagle and Leiter 1964). However, at a substantive level, researchers have questioned the methodological distinction between intentional and incidental

learning through presence and absence of prelearning instructions to memorize stimulus items (McLaughlin 1965). It is argued that learning in real life situation rarely takes place in isolation simply because of individual differences in motivations, but is often determined by the tasks individuals perform during the learning process (McLaughlin 1965). This argument is particularly valid in consumer choice situations. Buyers are typically guided by price or non-price factors in making a purchase decision depending upon the relative importance of these factors perceived by the buyers in the specific choice task. Clearly, these tasks will have considerable influence on buyers' learning of price information (Eysenck 1982).

#### Relative Importance of Price in Choice Task

The extent to which buyers use price information at the point-of-purchase has been investigated extensively by Dickson and Sawyer (1986). They found that overall (across four different product categories), 58% of the shoppers checked prices before making a purchase while the rest did not. The main reasons for checking prices were: to decide which brand to buy (21%), how much to buy (32%), and simply out of habit (22%). On the other hand, the two major reasons for not checking price were that price was not that important (70%) and that they were constrained by time (5%).

These results clearly indicate, among other things, that buyers place different degrees of importance on price and non-price factors while

making a purchase decision. Non-price factors in a choice decision are likely to distract buyers from price information and consequently, learning may not be very effective. On the other hand, when choice decisions are based simply on price-related considerations, buyers pay a closer attention to prices and produce effective learning of price information. Also, there are some shoppers who use both price and non-price factors in making a choice. In this case, the buyers' attentional capacities will be divided between price and non-price factors and their learning of price information will depend upon the relative importance of price in the specific task.

Methodologically, the tasks that individuals perform during the process of learning a set of target information have been referred to as "orienting tasks" (McLaughlin 1965; Eysenck 1982). Orienting tasks are usually manipulated in experimental situations by instructing subjects to perform different tasks using the stimulus information (Eagle and Leiter 1964). Some researchers maintain that orienting tasks enhance the depth and breadth of processing in that individuals tend to give meaning to the to-be-learned information in the context of the task (Craik and Lockhart 1972), and at the same time provide associative linkages between the to-be-learned information and other information related to the task condition (Puff 1982). However, other researchers argue that whether the target information will be encoded at a sensory level or at a semantic level will depend upon the nature of the orienting tasks (Hyde and Jenkins 1969). If the orienting task is in conflict with the target information,

individuals may not get the opportunity for elaborate processing and may end up processing the information only at a sensory level.

The final issue relating to orienting task is its differential effect on incidental and intentional learning. Two factors need to be considered in understanding the impact of orienting tasks on human learning. First, subjects under intentional learning with an orienting task condition are confronted on one hand with the prelearning instructions to memorize stimulus information for later recall and the instructions to complete the orienting task on the other (Postman 1964). However, the subjects under incidental learning with orienting task condition are required to perform the orienting task only and may or may not learn the target information depending upon the nature of the orienting task (Hyde and Jenkins 1969).

Second, the subjects in the intentional learning with orienting task condition faced with the two instructions will allocate their limited cognitive capacities depending upon the nature of the orienting task (McLaughlin 1965). To understand this phenomenon, Postman (1964) conceptualized a continuum of orienting tasks, ranging from those requiring responses maximally favorable to learning to those requiring responses maximally unfavorable. At either extreme on the continuum, the differences between intentional and incidental learning were postulated to be minimal. If the orienting task is extremely conducive to learning, then, regardless of whether a pre-learning instruction is present or not, subjects under both learning conditions are expected to learn the stimulus information equally well. On the other hand, if the orienting task is

totally irrelevant to learning, the subjects under intentional learning conditions will face the dilemma of allocating their cognitive capacity to two conflicting tasks (to remember stimulus information and completing the orienting task) and may end up learning the information no better than the subjects under incidental learning condition (Postman and Adams 1956). In fact, researchers have demonstrated that under certain conditions, the orienting task may actually interfere with intentional learning to such a degree that subjects under incidental learning will retrieve information better than the subjects under intentional learning (Saltzman 1956; Neimark and Saltzman 1953). These findings led researchers to question the distinction between intentional and incidental learning especially in the presence of an orienting task (McLaughlin 1965; Postman 1964).

McLaughlin (1965) provides a comprehensive review of literature that examined the effects of orienting tasks on incidental and intentional learning. This review concludes by noting that several issues need to be considered to determine whether or not subjects with prelearning instruction about a subsequent memory test (intentional learning) will perform better in the test than the subjects without such instructions (incidental learning). First, the extremity of the conduciveness and distractions of the orienting task relative to the to-be-learned information tends to reduce the difference between incidental and intentional learning (Postman 1964).

Second, subjects in the intentional learning group need to comply with two instructions--remember the information for later recall, and

complete the orienting task. If the task is favorable and requires usage of the to-be-learned information, then this group will tend to perform better than the incidental group because the two instructions complement each other, thus producing a synergistic effect on learning (Postman and Adams 1956; McLaughlin 1965). However, when the task interferes with the learning instruction, the memory performance of intentional learners will depend upon the subjects' relative motivation to comply with each instruction. The degree of compliance with two conflicting instructions depends upon the perceived rewards associated with each instruction and their relative ease of cognitive processing (Deese 1964).

Third, in presence of an orienting task, the task produces greater impact on learning than the learning instruction per se (Postman 1964). This issue is particularly important for consumer information processing because buyers' learning of product and price information usually takes place where the primary task is to choose a brand based on available information (Krugman 1965; Robertson 1976; Bettman 1979b; Biehal and Chakravarti 1983).

So far as processing of price information is concerned, buyers' learning of price typically takes place in the context of some choice task. Such tasks may either distract them from price information or will require them to extensively use such information (Dickson and Sawyer 1986). To examine the effects of different task orientations on buyers' learning of prices, this research developed three choice task situations:

(1) Non-price Based Choice Tasks: tasks requiring buyers to use non-price factors (like calorie and nutrition information) and make a purchase decision.

(2) Price Based Choice Tasks: tasks requiring buyers to use price-related information (like calculating unit prices) to make a purchase decision.

(3) Mixed Task: tasks requiring buyers to use both price and non-price factors (like weighing nutritional information against prices).

It is postulated that the task requiring greater usage of price information than non-price information will result in more effective learning of price information among buyers. Moreover, the manner in which buyers will encode price information will also vary under different task conditions. For example, buyers in the incidental learning condition and performing a choice task that requires usage of only non-price factors to make a purchase decision are unlikely to process the price information elaborately. Such processing will be only at a sensory level and the information is unlikely to find a place in long-term memory. Some buyers in such a condition may not even be exposed to prices even though such information was available at input stage. At the other extreme, buyers in an intentional learning situation and performing price- and mixed-tasks are likely to process price information elaborately and will try to encode the information in a meaningful manner. These buyers will not only perform well in recalling the prices of various items they purchase but they will also likely be able to rank the chosen item in terms of its

relative expensiveness and provide some meaningful associations between price and other attribute information.

The effects of learning intention and choice task orientation on buyers' learning of price information can be assessed by their relative successes to retrieve the information. However as argued before, retrieval performance is a function of compatibility or overlap between the encoding of information at the input stage and the cues provided at the time of retrieval (Tulving and Thomson 1973). Since different learning and task conditions are likely to produce different memory codes, retrieval performance needs to be assessed through different memory tests that might approximate the original encoding. The issues involved in evaluating buyers' price awareness through memory tests are considered next.

#### MEMORY TESTS TO EVALUATE PRICE AWARENESS

The main substantive question that this research seeks to address is whether or not buyers are aware or knowledgeable of the prices of previously purchased items. To address this issue, the construct 'price awareness' needs to be defined and a distinction between 'price awareness' and 'price consciousness' needs to be made.

### **Price Awareness and Price Consciousness**

Although price awareness and price consciousness have often been used interchangeably, the terms are not synonymous. Price awareness refers to the ability of buyers to remember prices, whereas price consciousness refers to buyers' sensitivity toward price differentials (Monroe and Petroshius 1981). Thus, price awareness refers to buyers' cognitive reactions to price in terms of how buyers encode and store price information in their memories and how they retrieve the information when they need it (Jacoby and Olson 1977). However, price consciousness refers to buyers' affective and behavioral responses to price differences, such that price conscious buyers prefer lower-priced alternative to higher-priced ones and such preferences are often translated into actual purchases. Thus, while it is likely that price-conscious buyers may also be price aware, it is not necessary that price-aware buyers would use price as a purchase decision criterion to the same degree (Powell 1985).

Although the definition of "price awareness" discussed above may seem unambiguous, previous research exhibits wide variations in terms of the researchers' interpretations as to what may constitute "ability to remember prices."

### **Previous Price Awareness Research**

In general, previous researchers have operationalized price awareness in three different ways: (1) buyers' ability to recall exact prices,

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Table 3

## Retention Tests Used in Previous Price Awareness Studies

Study	Research Setting and Method	Unit of Analysis	Sample Characteristics	Respondents' Subjects' Task				Verbal Protocol
				Exact Price Recall	Relative Price Recall	Express Certainty of Price	Actual Store Price-Level Ranking	
1. Gabor & Granger (1961) In-home (Interview)		Housewives	N=428 (Stratified)	X				
2. Progressive Grocer (1974) In-store (Interval)		Individual Shoppers	Male: 28 Female: 532	X				
3. Progressive Grocer (1977) In-store (Interval)		Individual Shoppers	N.A.	X				
4. Brown (1968, 1969, 1971) In-home (Interview)		Household	N=1063 (Area Sampling)					X
5. Allen, Marrell & Hutt (1976) In-store (Interview)		Individual Shoppers	N=1500 (Random)	X				X
6. Zeithaml (1981) Simulated Store (Quasi-Expt.)		Female Shoppers	N=160 (Random)	X	X			
7. Zeithaml (1982) Simulated Store (Quasi-Expt.)		Female Shoppers	N=160 (Random)	X	X	X		X
8. Zeithaml & Fuerst (1983) Simulated Store (Quasi-Expt.)		Female Shoppers	N=160 (Random)	X	X	X		X
9. Wilkinson, Mason & Bonfield (1976) In-store (Interview)		Individual Shoppers	N=1500 (Multi-stage random)					X
10. Conover (1986) [Study 1] In-store (Interview)		Individual Shoppers	Male: 32 Female: 136	X	X			X
11. Conover (1986) [Study 2] In-store (Experiment)		Female Shoppers	N=66 (random)	X	X			X
12. Powell (1985) In-store (Interview)		Individual Shoppers	Male: 6 Female: 54	X	X	X		X
13. Dickson & Sawyer (1986) In-store (Interview)		Individual Shoppers	N.A.	X				X

1974) to 56% (Allen, Harrell, and Hutt 1976). In general, such low recall scores have usually led to the inference that buyers perhaps do not pay much attention to prices they pay. However, in absence of a benchmark as to what constitutes a satisfactory recall accuracy score, it is difficult for researchers to make a substantive inference about shoppers' price awareness.

Second, some researchers have measured exact price recall performances as the absolute differences between recalled price and correct price expressed as a percentage of the correct price (Allen, Harrell, and Hutt 1976; Zeithaml 1981; Conover 1986; Dickson and Sawyer 1986). As shown in Table 4, this measure of exact price recall performance varies from 6% (Dickson and Sawyer 1986) to 19.45% (Zeithaml 1981; 1982). Such small error in price recall when contrasted with the aggregate proportion of incorrect response leads to a quite different conclusion about buyers' price awareness. For one thing, the results show that even though a large proportion of shoppers could not recall the exact price, their estimates were very close to the correct price. One possible implication of this 'near accuracy' could be that a large proportion of shoppers did not attempt to memorize prices for later recall. However, these shoppers had a fairly good idea of the prices they paid and with additional cues provided to the shoppers, perhaps their retrieval process would have been more effective.

Table 4

## Different Operationalizations of Price Awareness and Selected Summary Results

Study	Percent of Shoppers Correctly Recalled Exact Price	Percent of Shoppers Correctly Recalled Score Within $\pm$ 5% of Exact Price	Relative Average Price Recall Error	Percent Absolute Average Price Recall Error	Relative Price Recall Error	Confidence That Price Reported Was Correct	Recognition of Correct Price Among 5 Alternative	Total Value of Purchase Given a Budget	Perception of Stores' Price Level	Recognition of Regular vs. Specialized Products
1. Gabor & Granger (1961)	X (51.1%)	X (65.0%)								
2. Progressive Grocer (1974)	X (8.0%)	X (24.0%)								
3. Progressive Grocer (1977)		X (30.0%)								
4. Brown (1968, 1969, 1971)						X				
5. Allen, Harrell & Hutt (1976)	X (55.8%)									
6. Zeithaml (1981, 1982), Zeitlaml & Fuerst (1983)										
7. Wilkinson, Mason & Bonfield (1976)									X	
8. Conover (1986) [Study 1]	X (51.2%)		X <sup>(4)</sup> (1-0.57)	X (6.10%)	X <sup>(2)</sup>					
9. Conover (1986) [Study 2]	X (1:25.6%) (D:27.4%)		X <sup>(4)</sup> (r=.078)	X (1:16.4%) (D:13.4%)	X <sup>(3)</sup>					
10. Dickson & Sauver (1986)	X (47.07%)		X							
11. Powell (1985)	X (42.0%)					X	X (56.0%)			

(1) Percent Absolute Average Price Recall Error =  $\frac{|\text{Recall Price} - \text{Correct Price}|}{\text{Correct Price}} \times 100$ (2) Relative Price Recall Error =  $\frac{|\text{Recalled Rank} - \text{Correct Rank}|}{\text{Correct Price Rank}} \times 100$ (3) Relative Price Recall Error =  $8 \left[ \frac{b - P_1}{h - P_1} + 1 \right]; \quad (4) r = \text{Corr (Actual Rank, Recalled Rank)}$ I: Immediate Recall  
D: Delayed Recall

### **Relative Price Recall**

While exact price recall has been a dominant operationalization of price awareness, more recent researchers (Zeithaml 1981; 1982; Conover 1986) have supplemented this measure with what is referred to as relative price recall (Table 3). These researchers have recognized the possibility that even though some buyers may not recall exact prices of various items, they may have a fairly accurate idea as to how brands rank against each other in terms of their prices. In fact, in Zeithaml's (1982) study, a portion of buyers agreed that they encode price information in this manner and these buyers performed better in the price ranking exercise than in recalling exact price. Also, in both the studies undertaken by Conover (1986), the correlations between recalled and actual ranks of brands were found to be statistically significant (Table 4).

The main argument behind using a relative price recall measure is that buyers often carry out inter-item processing (processing of several pieces of information at a time) rather than intra-item processing (one piece of information at a time). Moreover, the measure is consistent with the adaptation-level theory (Helson 1964) which suggests that prices are not judged singly but comparatively against some perceptual reference price and other prices within an acceptable range (Monroe 1973; Monroe and Petroshius 1981). When buyers do not have a preformed reference to evaluate alternative prices, they are likely to use the price information available at the point-of-purchase to carry out a meaningful comparison (Widrick 1980). Therefore, when buyers rely on point-of-purchase price

information and when buyers guide their choice tasks on the basis of price differentials, it is likely that price information will be encoded as relative prices rather than the exact prices.

### **Recognition**

The only study that used a recognition test in addition to exact price recall was by Powell (1985) (Table 3). The main difference between a recall and a recognition test is that recognition tests provide additional cues to the subjects, in that the actual price is presented along with other distractor prices, and the subjects are to choose the correct price. Powell (1985) and Monroe, Powell, and Choudhury (1986) argued that in a typical grocery shopping situation, shoppers' learning of price information is incidental in nature since usually they do not memorize prices for later recall. However, when price is an important factor in their choice process, shoppers may be able to discriminate the correct price from the incorrect ones when the correct price is presented to them. In other words, the presence of the correct price provides subjects with an additional cue that activates the associative pathways formed during the original encoding process and thus makes the retrieval process more effective than unaided recall (Anderson and Bower 1972).

Since recognition performance is generally found to be better than recall performance, many early researchers concluded that recognition involves a somewhat easier retrieval function than recall (McDougall 1904; Kintsch 1970; Anderson and Bower 1972). However, current re-

searchers maintain that recall and recognition tests involve two different memory processes both at information input stage as well as at the retrieval process (Mandler 1972; Gillund and Shiffrin 1984). These researchers argue that under many circumstances recall performance may even be better than recognition depending upon the retrieval task expected by the subjects at the information input stage (Eagle and Leiter 1964; Tversky 1973), closeness of the distractor items in a recognition test (Eysenck 1977), frequency of occurrence of stimulus (Kintsch 1970), and a number of other factors.

While the effects of these factors on recall and recognition test performance is discussed in detail later in this section, a few important issues regarding use of recall and recognition tests to measure buyers' price awareness needs to be addressed. First, in presence of some task orientation, buyers' learning of price information usually takes place incidental to the choice task. If the task interferes with buyers' intention to learn for later recall, then recognition performance is likely to be better than recall (McLaughlin 1965). Second, buyers who anticipate a subsequent recall test are likely to perform better in a recall test than the buyers who did not. However, anticipation of a recall test may not produce significant improvement in recognition test performance (Estes and Dapolito 1967). Third, if the choice tasks involve heavy usage of price information, then the difference between recall and recognition test performances is likely to be minimal (Postman 1964). Finally, there may be some proportion of buyers who may not perform well in either test.

Additional memory tests are required to infer about the way price is encoded by these buyers.

### **Confidence**

Researchers have argued that accuracy measures alone may not be a complete evaluation of different memory tests (recall, relative recall, and recognition) because these measures do not take into account subjects' response biases and guessing effects (Murdock 1982). In response to this concern, a few researchers have obtained buyers' confidence judgements about recall and recognition accuracies as supporting measures of price awareness (Zeithaml 1981, 1982; Zeithaml and Fuerst 1983; Powell 1985). It has been observed that buyers' confidence is positively related to their response accuracies in different memory tests. The theoretical justifications of using supporting measures of awareness, such as confidence, will be provided in Chapter III.

In summary, the above review of past price awareness research suggests that researchers have generally employed three types of memory tasks--exact price recall, relative price recall, and recognition as measures of buyers' price awareness. However, the performance in exact price recall has been the most commonly used indicator. The review also shows that the manner in which the scores of these memory tests are interpreted varied across researchers. The questions that the review now lead to are: which measure of price awareness is the most appropriate one, and how the measures are to be interpreted. To answer these

questions, several conceptual issues discussed earlier need to be reiterated.

First, buyers do not perceive price information in a similar manner (Monroe 1973). That is, the manner in which actual numeric values of prices are encoded in buyers' memories varies across shoppers depending upon how they choose to comprehend and provide meaning to the information (Jacoby and Olson 1977; Olson 1980). The manner in which buyers would assign meaning to incoming price information is influenced, among other things, by the nature of memory tests expected by the buyers (Eagle and Leiter 1964; Tversky 1973) and the nature of tasks performed during the choice process (Postman 1964; McLaughlin 1965).

Second, since buyers are likely to encode prices differently, different memory tests will be necessary for retrieval of the information from memories. Also, since making a priori assessments of original encoding is usually problematic, the relative success of different memory tests can be used to make ex-post-facto inferences about the nature of memorial representations by assuming that each test will tap its own level of encoding (Wingfield and Byrnes 1981; Tulving and Thomson 1973).

Third, buyers' failure to respond correctly in a given memory test cannot be unambiguously interpreted. Whether the inability of buyers to respond correctly in a test might be interpreted as indicating lack of price awareness or instead as a case of retrieval failure is a major point of disagreement of researchers (Monroe, Powell, and Choudhury 1986). Memory researchers argue that while it is possible for some information not to find a place in permanent memory, failure to retrieve information from

long-term memory does not always mean that the information is not there in memory or that it has decayed, but it may simply be that the memory test did not provide appropriate cues so as to activate the associative network necessary for accessing the information (Eysenck 1977; Murdock 1982).

To address these three issues, it is necessary to examine the cognitive processes involved in different memory tests and what factors might facilitate or inhibit successful retrieval in each test. Since this research is primarily concerned with recall and recognition, the issues involved in these two memory tests will be considered first.

### Recall and Recognition Tests

In both recall and recognition, subjects are exposed to a list of stimulus information followed by a retrieval task. The retrieval task, however, differs for recall and recognition, and the way the subjects seem to retrieve information varies as a result.

#### **Recall Test**

Recall (or unaided recall) is the process by which individuals retrieve information from memory without the help of any external cue. Recall is very similar to "remembering" in the term's commonly used sense. Some examples of recall tests are: a shopper, while preparing a shopping list is trying to remember prices of items she intends to purchase or, a

shopper at a store trying to remember the prices of items at the previous store she had visited. In general, recall of price takes place when the information is not available from external sources and buyers have to reconstruct the stimulus (Bettman 1979b).

Anderson and Bower (1972; 1973) and Anderson (1974) presented a detailed model of recall in the context of an associative-network view of long-term memory. The model suggests that different pieces of information are not randomly stored in various parts of memory, but are organized or categorized in some systematic manner with some common labels and are associated with one another. Recall is initiated by a retrieval instruction which signals the long-term memory location from which search is to begin. The recall process then consists of following associative pathways from various information connected with the retrieval instruction. This is called the search process, because it is a search for the required item from a set. When such an item is found, the recall task is successful. However, in some situations the search process may not lead to correct recall, either due to use of a wrong pathway or due to a broken link between the followed path and the target item (Anderson and Bower 1972). Other researchers have rejected this explanation of failure to recall (Newell and Simon 1972; Tversky 1973). Tversky (1973) argued that individuals may encode information differently, depending upon what type of memory test is expected. Thus, a test involving recall will not be successful when the original encoding was different because an incompatible test may not activate the search process. The problem of a recall test, therefore, is that when the encoding of information was made in

anticipation of a different retrieval task, individuals' failure to respond may not mean that the information is not present in memory but it may be that the memory test was not appropriate for the encoding process used. For example, when buyers expect that all the price information needed for making a purchase decision will be available at the point-of-purchase, it is unlikely that these buyers would attempt to memorize the information for later recall. However, this may not mean that they do not have any memorial references of prices. Perhaps, when these buyers are re-exposed to prices, they may be able to determine whether or not the current prices are the same as what they paid earlier. In this case a recognition can be said to have occurred.

### **Recognition Test**

What distinguishes a recognition test from a recall test is that in a recognition test the target information is presented along with other distractor information. The retrieval task therefore involves identification of the correct information from among the incorrect ones. As mentioned before, recognition of a previously learned price occurs when buyers are able to determine whether or not the price they now see at the point-of-purchase matches with the previously encountered price. A recognition test therefore requires that the information be presented externally so that reconstruction of the stimulus is not necessary during the retrieval process. However, to be successful in a recognition test,

the subjects must be able to discriminate between the old and new information.

Within this basic definition of a recognition test, a number of variations are possible (Table 5), although the forced-choice type of recognition test is the most popular procedure used by memory researchers.

### Comparison Between Recall and Recognition

Comparative assessments of recall and recognition test performances have produced some interesting results in memory research. In general, subjects were found to perform better in a recognition test than in a recall test (Klatzky 1980). This finding led early memory researchers to believe that recognition is an easier test because successful recall requires additional memory strength (McDongall 1904) or it involves additional steps (search and decision) in the retrieval process than recognition (only decision) (Anderson and Bower 1972; Kintsch 1970).

According to these views if an item is recalled, it will also be recognized. While Kintsch (1970) found support of the phenomenon in some situations, it was not supported in others. Frequent words are recalled better than infrequent words whereas infrequent words are better recognized than frequent words. Besides, recognition performance was seen to be dependent on a number of other factors like numbers and closeness of the distractor items, presentation rate, and serial position of the target item in the test.

**Table 5**  
**Different Recognition Test Procedures**

Yes/No Recognition Test	As each price appears, subjects are to say 'yes' if they think it was the correct price, and 'no' otherwise.
Forced-Choice Test	Subjects get two or more prices to pick the right one from. The forced-choice test is like a multiple choice test.
Batch Testing Procedure	All correct and distractor prices are mixed and presented at once. Subjects then indicate which prices are the correct ones.

To address the discrepancy, a modification was suggested by Mandler (1972), Mandler, Pearlstone, and Koopmans (1969), Mandler and Boeck (1974), and Atkinson and Juola (1973). According to their positions, recognition is not purely a decision process but it also involves a search component as well. That is, in a recognition test, the target information is not located in memory automatically; instead, there may be a search-like process involved as well (Gillund and Shiffrin 1984). For example, some distractor items can be eliminated very easily and quickly, but after that the search process begins in order to determine which of the remaining items is appropriate to report.

The current view holds that recognition and recall differ in terms of the basic types of memory processing (Guillund and Shiffrin 1984). To recognize a stimulus from among a set of other distracting items, processing that allows individuals to differentiate or discriminate the previously encountered stimulus is necessary (Stein 1978; Bettman 1979b). To recall, however, processing allowing one to reconstruct the stimulus is required, since the stimulus itself is not present (Lockhart, Craik, and Jacoby 1976; Bettman 1979b). Support of this distinction between discrimination and reconstruction in recognition and recall has been found in a number of investigations relating to the differential effects of a number of factors on recognition and recall performance. These factors are: (a) Frequency of occurrence of stimulus, (b) plans for learning attempted by individuals, and (c) processing time available.

### **Frequency of Occurrence of Stimuli:**

The first set of findings showing differences between recognition and recall is that words with low frequency of occurrence in normal text seem to be recognized better than words of high frequency, whereas the reverse is true for recall (Kintsch 1970; Shepard 1967). Low frequency words are easier to discriminate, whereas high frequency words seem to lead to more associations of the type needed to reconstruct the word for recall. This finding has two important implications in price awareness research. First, stable prices of frequently purchased items will be recalled more easily than unstable prices of items with similar frequency of purchase. However, an unusual change of price can be recognized by buyers more easily than they can be recalled. Second, prices of infrequently purchased items may be better recognized than recalled.

### **Plans for Learning in Recognition and Recall**

It was suggested earlier that people tend to follow different plans for learning stimulus information depending upon whether a recognition or recall test is expected. Given the difference in the retrieval tasks themselves, with discrimination required for recognition and reconstruction for recall, this difference in learning plans should take place if individuals adapt to the anticipated memory tests (Newell and Simon 1972).

Eagle and Leiter (1964) examined the effects of different plans for learning in an experiment having three learning conditions: (a) intentional learning where subjects were told that the lists of words presented would later have to be recalled; (b) intentional learning with orienting task where subjects, in addition to being alerted about the recall test, were required to classify the words as nouns or verbs; and (c) incidental learning with orienting task where subjects were required to make the same classification of words but they were not forewarned about the memory tests. The results showed that intentional groups recalled more than incidental groups, but that the incidental and intentional with orienting task groups actually recognized more. Eagle and Leiter (1964) explained these results by postulating that the important variable is the plan for learning subjects use, how they process the list, not the intentional or incidental manipulation per se. They argue that an effective strategy for recall is to select some words for maximal attention (e.g., by grouping, or forming associations). For recognition, however, a strategy that results in a spread of attention over the words on the list should be better. The task of classifying words by types of speech was seen as spreading attention, whereas the intentional group, without this task and with recall instructions, was seen as focusing attention. Eagle and Leiter (1964, p. 62) conclude that "intention plays an important role in learning only to the extent that it leads to a plan that is effective for guiding learning." Although the specific finding that recognition was higher for incidental groups than for intentional groups has been ques-

tioned by Postman 1975, the major point is that Eagle and Leiter introduced the idea of differential plans for learning (Bettman 1979b).

Support of using different learning plans in recognition and recall also came from the results of other investigations. Tversky (1973) argued that subjects may actually encode information differently, depending on the type of test expected, recall or recognition. In her experiments, subjects were given recall or recognition test expectations before presenting the lists to be memorized, and then both recall and recognition tests were administered. Thus, each group performed on one test they did not expect. Subjects performed better on the memory test which they were led to expect. The test expected may have led to a form of encoding which the subject believed would be useful for that retrieval task.

These findings imply that consumers, while encoding incoming information, may encode with some retrieval task in mind. In some cases, the expectation of having to recall or recognize marketing stimuli is set a priori (Bettman 1979a;b). For example, shoppers who perform out-of-store planning or make store price comparisons are likely to expect the need for later recall of price information and therefore, may encode the information for later recall. On the other hand, shoppers who plan and execute their shoppings at the store plan their learning in a manner that facilitates later recognition of information.

The plan of learning involved in recall and recognition also influence the amount of information buyers will learn. Buyers who want to learn price information for later recall will tend to focus maximal attention to a few selected prices, and are likely to be able to recall

those specific prices correctly. However, in recognition-oriented learning, buyers provide greater spread of attention and may be able to recognize more information than the recall group. At the experimental level, the differential impacts of learning plans on amount of information learned can be tested by assigning subjects to two groups: (a) intentional (or recall oriented) learning group where the subjects are instructed to remember the prices of the items they select for responding to a subsequent memory test, and (b) incidental (or recognition oriented) learning group where no such instructions are given. Following the arguments presented above, it can be postulated that the intentional subjects would exhibit greater recall accuracy of prices of the selected items than the incidental group; but they (intentional group) are likely to have little knowledge about the prices of other items. On the other hand, the incidental group may not perform as well as the intentional group in the recall test but they (incidental group) may be able to perform better than the intentional group in recognition tests involving prices of the items not selected.

Finally, the effect of learning plans adopted by buyers on their price recall and recognition performance is mediated by the nature of tasks they perform during the choice process. If the choice task involves extensive usage of price information, then the recall-oriented learning is facilitated because of the complementarity between the learning plan and the choice task. It is likely that price recall performance of these buyers may be as good or even better than their recognition test performance. However, if the choice task requires usage of non-price in-

formation, then the buyers are likely to find it exceedingly difficult to pursue their plans of learning for later recall. Therefore, despite their intention to learn price information for later recall, their performance in a price recall test may not be any better than that in a recognition test.

#### **Effect of Processing Time**

The time available for processing stimulus information is another factor that influences recall and recognition performance differently. Research shows that the time required for transferring a chunk of information to long-term memory is more for recall oriented learning (five to ten seconds) than for recognition oriented learning (two to five seconds) (Bettman 1979b). This implies that shoppers may choose to guide their learning plans adaptively, choosing to rely on recognition more in situations in which they feel time pressure, and choosing to rely on recall more when they do not have such time constraints (Bettman 1979b).

In summary, the above discussions suggest that recall and recognition involves different encoding processes guided by the anticipated memory tests. Recall and recognition performance are influenced differentially by several factors like frequency of occurrence of stimuli, plans of learning, and the processing time available to the buyer. The next sub-section will examine information processing involved in relative price recall.

### Relative Price Recall

Several researchers have argued that buyers often encode price information in terms of relative expensiveness of several items in their choice sets in order to make a meaningful comparison and eventual choice decisions (Jacoby and Olson 1977; Olson 1980; Zeithaml 1982; Conover 1986). This type of memorial representations of prices has been referred to as semantic encoding by Zeithaml (1982) because of apparent meaningfulness of such encoding in purchase decisions.

Arguments in favor of relative price encoding come from adaptation level theory (Helson 1964). Using adaptation-level theory, Monroe (1973, 1979) and Monroe and Petroshius (1981) suggested that buyers do not judge each price singly; rather each price is compared with the reference price and other prices in the price range. Therefore, buyers' perceptions of price are usually relative to other prices.

Even though the theoretical arguments in favor of relative price encoding are strong, there has been very little empirical research to identify the determinants of this type encoding. In other words, little is known about the factors that cause buyers to encode relative prices as opposed to exact prices. Zeithaml (1981, 1982) found that longer shopping (or encoding) time and structured list of unit prices improves relative price recall performance. While these two factors may enable buyers to encode relative prices, what seems to cause a more direct impact on such encoding is the type of tasks buyers perform during the choice process (Bettman 1979b). It can be postulated that buyers who compare

prices and rank items in terms of their expensiveness to make a choice decision are likely to perform more accurately in a relative price recall test than the buyers who do not carry out this kind of task. Thus, price comparison shoppers are likely to be more accurate in a relative price recall test than in an exact price recall test.

Having discussed the encoding processes involved in different types of learning and having identified the processes involved in different memory tests (exact price recall, relative price recall, and recognition), it is now possible to develop several theoretical propositions about buyers' price awareness.

### THEORETICAL PROPOSITIONS

This section uses the conceptual arguments presented in previous sections to develop several theoretical propositions for this research. The propositions capture the differential impacts of intentional vs incidental learning and nature of choice tasks on buyers' performance in recall, recognition, and relative recall tests involving price stimuli.

#### Effects of Intentional and Incidental Learning

It was argued earlier that buyers guide their learning plan depending upon the type of memory test expected (Newell and Simon 1972). Intentional learning will occur when buyers anticipate that the prices they need for evaluating alternatives or for making a store selection will not

be easily available from external sources (Bettman 1979b). Buyers in such situation will tend to rely on their internal memories and will encode price information for later recall (Bettman 1979b). On the other hand, when buyers feel that the required price information will be available at the point-of-purchase (external memory) and that they have no need for recalling the information for making a purchase decision, they will tend to encode prices in a manner that facilitates recognition (Monroe, Powell, and Choudhury 1986; Bettman 1979a, b).

**Proposition 1**

Buyers who tend to rely more on their internal memories for price information (intentional) will exhibit greater price recall accuracy than buyers who tend to rely more on point-of-purchase price information (incidental).

**Proposition 2**

Buyers who tend to rely more on point-of-purchase price information (incidental) will exhibit greater accuracy in a price recognition test than in a price recall test.

Apart from the above two propositions, intentional and incidental learning also have differential impacts on the amount of information learned. As discussed earlier, intentional learning involves providing maximal attention to a few pieces of information while incidental learning permits greater spread of attention (Eagle and Leiter 1964). Thus, buyers who are not preoccupied with memorizing prices for later recall may in fact learn a greater amount of price or other product information and may recognize prices or other information than buyers who try to learn prices for recall.

### **Proposition 3**

Buyers who tend to rely more on point-of-purchase (incidental) for price information will recognize a greater number of previously encountered price or other information than buyers who tend to rely more on their internal memories (intentional) for certain specific prices.

### **Effects of Task Orientations**

As discussed before, buyers differ in terms of their perceived importance of price in a given choice task. Some buyers may rely only on non-price factors for making a purchase decision; other buyers use price as the only criterion for choice; yet others use both price and non-price factors to make a decision. The relative importance buyers place on price and non-price factors is likely to influence buyers cognitive processing of price information in the following manner.

### **Proposition 4**

Greater usage of price information than non-price information in making a purchase decision results in greater price recall and recognition accuracies.

### **Proposition 5**

Shoppers who use prices of different items as the main (or only) criterion for choice are likely to exhibit greater accuracy in a relative price recall test than in an exact price recall test.

### **Joint Effect of Learning Intention and Task Orientations**

Given a choice task, the information processing involved in the task itself, produces a greater impact on buyers' learning of price information than their prior intention to learn (Postman 1964; McLaughlin 1965). This

implies that whenever buyers learn about prices in the course of making a purchase decision, such learning is incidental to the choice task regardless of whether they had prior intent to learn. In general therefore, buyers are likely to perform better in recognizing previously encountered prices than being able to recall them.

#### Proposition 6

Whenever buyers learn about prices in the process of making a choice, they will exhibit on the average greater accuracy in a price recognition test than in an exact price recall test, regardless of whether they had prior intent to memorize prices for later recall or not.

Although in general the presence of a task during the learning process moderates the effect of learning intention, the relative success in recall and recognition tests will depend upon the specific nature of the task. When the choice task involves usage of non-price information, the buyers with intention to learn prices are confronted with two conflicting cognitive demands. Since the choice task produces greater impact on learning than the intention per se, these buyers may not be able to fulfill their intention completely. This implies that recognition performance will surpass their recall performance.

On the other hand, when the choice task involves extensive usage of price information, the buyers with intention to learn prices may find the choice task complementing their learning intentions. In such a situation, the exact price recall performance may equal, or even exceed the recognition accuracy.

**Proposition 7**

Buyers, when faced with a choice task that requires them to use non-price information, will exhibit greater accuracy in a price recognition test than in an exact price recall test, despite their prior intention to memorize prices for later recall.

**Proposition 8**

Buyers, who have a prior intention to memorize prices for later recall and performing a choice task that requires them to use only price information, will exhibit equal or greater accuracy in an exact price recall test than in a price recognition test.

Finally, when the choice task involves extensive price comparisons, buyers' encoding of prices in a relative fashion is not influenced by their prior intent to learn the information for later recall. Thus,

**Proposition 9**

Buyers, who have a prior intention to memorize prices for later recall and performing a choice task that requires extensive price comparisons will exhibit no greater accuracy in a relative price recall test than buyers who did not have such intention and performing the same choice task.

Apart from the above propositions, the theoretical arguments presented earlier lead to three more propositions. The propositions relate to frequency of purchases and frequency of price change.

**Proposition 10**

Stable prices of frequently purchased items will be recalled more accurately by buyers than unstable prices with similar purchase frequency.

**Proposition 11**

Unusual change of prices will be recognized more accurately by buyers than they can be recalled.

**Proposition 12**

Buyers will exhibit greater recognition accuracy than recall accuracy for prices of infrequently purchased items.

## CHAPTER SUMMARY

The purpose of this chapter was to provide the conceptual foundation for this research and develop testable propositions about buyers' price awareness under different learning and choice task conditions.

It has been argued in this research that buyers have different shopping orientations and they employ different strategies to complete their shopping tasks (Monroe and Guiltinan 1980). The difference in shopping strategies influences the manner in which buyers process and encode price information, depending primarily upon (1) buyers' relative reliance on internal and external memories (point-of-purchase) for price information, and (2) their perceived importance of price and non-price factors in a given choice task.

Because of the possibility of buyers' encoding price information differently, performance of a single memory test involving price stimuli cannot be unproblematically used as the only indicator of their price awareness or price knowledge. In fact, buyers' failing to respond correctly in any given memory test cannot be unambiguously interpreted as to whether buyers are unaware of the prices or whether these are cases of retrieval failure due to incompatible or insufficient retrieval cues.

Despite the problems of making a conclusive inference about buyers' price awareness, it is nonetheless possible to postulate differential impact of buyers' intention to learn prices and their choice task orientations on their relative performances in different memory tests. This chapter provides necessary conceptual arguments to postulate that when

buyers learn about prices in the course of making a choice task, their ability to recognize the correct prices will be greater than their ability to recall. Therefore, in most purchase situations, recognition test performance appears to be a more appropriate measure of price awareness than exact price recall. However, the only situation where the recognition performance may not be superior to recall performance is when buyers have explicit intent to memorize prices for later recall and when such an intent is accompanied by a choice task that requires extensive usage of price information.

Second, the nature of the tasks that buyers perform during the choice process produces a greater impact on their learning or awareness of price information than their prior intention to learn. Greater use of price information than non-price information in a choice decision will result in better performance in both recall and recognition tests involving price.

Third, buyers who use prices and price differentials as overriding criteria for choice will tend to evaluate prices of different items comparatively. These buyers will tend to be more successful in ranking items in terms of their prices than in recalling exact prices. Moreover, relative price encoding is unlikely to be affected by buyers' prior intent to learn exact prices.

Fourth, the buyers who use prices for their prepurchase planning and for store selection will learn prices for later recall. These buyers are likely to perform better in recalling prices than the buyers who rely

mainly on point-of-purchase price information for completing their shopping tasks.

Finally, there may be a group of shoppers who may not perform well in any of the three memory tests--exact recall, relative recall, and recognition. While it is possible that a portion of shoppers in this group do not have any memorial representation of prices, others may be able to recall the first digit of the prices, or may be able to estimate with some degree of confidence the price range within which a given price would fall. Additional memory tests will be necessary to tap these kinds of price information encoding.

There are two major conceptual arguments advanced in this chapter in support of the above postulated relationships. First, buyers tend to guide their plan for learning price information with some anticipated retrieval task in mind. Second, the effect of the learning plan is moderated by the nature of tasks buyers perform during the learning process. Some choice tasks may interfere with the learning plans, while others may reinforce the learning plan. Thus, an investigation about buyers' price knowledge necessarily requires examination of both the individual as well as task-related factors to make some meaningful interpretations of their memory test performances and their price knowledge.

## CHAPTER III

### RESEARCH DESIGN AND METHODOLOGY

#### OVERVIEW

This chapter presents the research design and the methodological procedures employed in this research. Some of the theoretical propositions developed in the previous chapter are translated into operational hypotheses that are amenable to empirical testing. Specific issues relating to the choice of research method and setting, and sampling procedure are addressed.

The hypotheses developed in this research were tested in a laboratory experiment using women shoppers as subjects. Learning intention and choice task orientations, the two experimental factors were fully crossed using two levels of learning intention and three levels of choice task orientations, producing six experimental conditions. Subjects, after taking part in a simulated grocery shopping and having made selections using specific choice criteria were given a series of memory tests involving prices of the items selected. The results of these tests were used as the dependent measures when testing the hypotheses.

To describe the research procedure in greater detail, this chapter is organized as follows. The first section develops the operational

measures of the dependent variables in order to translate the theoretical propositions developed in Chapter II into operational hypotheses.

The second section presents the specific aspects of the proposed methodology to be used to test the hypotheses. To put the methodological aspects into perspective, this section begins with a broad statement of the methodological objective of the research to understand its impact on the choice of research methods. The section then develops arguments for choosing the specific research method, setting, design, and the sampling procedures.

The third section describes the experimental procedure used in this research. First, a brief description of the experiment is presented. Specific aspects of the cover story, design of the experimental stimuli, and the procedure to manipulate the independent variables are described next. The impact of the pretest results in developing each aspect of the experiment is highlighted, followed by the procedures used to assess the strength of the experimental manipulation.

The fourth section describes the three memory tests used in the study, the development of the confidence scale, and the procedure used to assess subjects' individual characteristics in terms of their price consciousness and relevant demographic factors.

The fifth section examines the validity issues of the research method and designs used followed by a summary of the chapter.

### RESEARCH HYPOTHESES

In the previous chapter, it was argued that the extent to which buyers learn price information from external sources would depend, among other things, upon (1) their intention to learn the information, and (2) the nature of tasks they perform during the choice process. Several theoretical propositions to capture the differential impact of these factors on subjects' performance in recall, recognition, and relative recall memory tests were developed and presented.

To assess the impact of these two factors on the memory tests, it is necessary to describe how the performances in the tests can be evaluated so that their comparative assessment is possible. While percentage of correct responses is a commonly used indicator to evaluate how well an individual has performed in different memory tests, it is argued that this measure alone may not fully capture the underlying construct, price awareness. It is suggested that subjects' confidence about the correctness of their responses also be used as a supporting measure to the accuracy measure.

### Evaluating Memory Test Performance

The memory tests that are of primary interest in this research are (1) exact price recall, (2) price recognition, and (3) relative price recall. As described earlier, exact price recall involves buyers' ability to remember and report correctly the previously encountered prices with-

out any external cues. In a recognition test, buyers' ability to identify the correct price from among a set of distractor prices is evaluated. In a relative price recall test, the buyers' task is to rank different items in terms of their prices.

Two major problems of evaluating memory test performances from response scores alone are the effects of guessing and subjects' response biases (Murdock 1982). Correctness of a response does not tell researchers as to whether the subjects were fully certain about the correctness, or whether the responses were their best guess estimates (Clarke 1964). To mitigate these two biases, memory researchers have recommended that three measures of retention test performance be used: (1) accuracy, (2) confidence, and (3) latency (Murdock 1982).

### **Accuracy**

Three measures of response accuracy have been used in memory tests involving price stimuli: (1) percentage of prices (or items) correctly recalled (or ranked) or recognized (Powell 1985; Dickson and Sawyer 1986), (2) percentage absolute recall-error (Zeithaml 1982; Conover 1986), and (3) correlation between the recalled price (or rank) and the correct price (or rank) (Conover 1986). All three measures bring the response accuracy to a common metric which makes comparative assessment between recall and recognition test performance possible. However, a close analysis would reveal that the information content of the three measures is different. Besides, each measure has certain disadvantages not only in terms of

substantive interpretations, but also in terms favoring one type of memory test over another.

When either free recall or forced choice m-alternative recognition tests involving verbal stimuli is used, percentage correct response is considered to be an acceptable measure of test accuracy (Murdock 1982). However, when the stimuli includes numeric values (like price), the aggregate percentage measure does not provide information about how close the response was to the target item. For example, two price responses, one deviating by 1 cent and the other by 9 cents are treated alike as incorrect response even though one response is clearly more accurate than the other.

The correlational measure and the percentage error measure overcome the problem of near accuracy in a recall test. However, in a recognition test, neither measure is appropriate because they are clearly dependent upon the closeness of the distractor items. Thus, it is difficult to tell whether a low error percentage or high correlation is due to subjects' response accuracy or whether it was due to the closeness of the items in the recognition tests. Clearly, the recognition test itself becomes a source of confound when such measures of response accuracy are used to test the difference between recall and recognition test performances.

In view of the above problems of using percentage error and correlation measures, this research used percentage correct response when comparing response accuracies in price recall, recognition, and relative recall tests notwithstanding the inability of this measure to address the issue of differential accuracy. However, when the effects of learning

intention and choice task orientations on different memory tests are evaluated separately, all three measures of accuracy (viz. percent correct, absolute recall error percent, and correlation between recalled price or rank and actual price or rank) were used to assess the consistency of subjects' responses.

### **Confidence**

In order to obtain an estimate of subjects' response biases and effects of guessing, researchers have recommended that ratings related to subjects' confidence about correctness of a response be taken as a supporting measure of retention test performance (Pollack and Decker 1964; Murdock 1982).

Confidence judgments are subjects' own assessment of the accuracies of their responses (Murdock 1982). In a 'yes/no' recognition test, confidence measures provide an estimate of subjects' criterion effect which is defined as the level of certainty that the subjects need to feel before indicating an item to be 'old' or correct (Clarke 1964). However, in recall and forced-choice recognition tests, where subjects are forced to make a response, confidence judgements provide an indication as to whether the response was correct because they knew it for sure, or whether it was a lucky guess.

Previous empirical findings have shown that in general, response accuracy and confidence judgement covary (Pollock and Decker 1964; Clarke 1964). This covariation has been explained by the memory strength hy-

pothesis, which suggests that the stronger the memory trace for the 'old' (or correct) items gets, the further apart the distributions of the 'old' (or correct) and 'new' (or, incorrect) items move from each other (Green and Swets 1966; Banks 1970). Thus, the zone of confusion (i.e. the area of overlap of the two distributions) decreases and subjects can be more confident about whether or not their responses are correct (Klatzky 1980; Clarke 1964).

In a 'yes/no' recognition test, confidence is commonly measured with the help of bipolar rating scales, with "sure no" and "sure yes" at the two extremes (Murdock 1982; Pollack and Decker 1964). However, when the retention test involves naming the stimulus (as in recall) or identifying the correct item from among a set of distractor items (as in forced-choice recognition), probability scales (absolutely certain-absolutely uncertain) are used (Clarke 1964). Since this research used recall and forced-choice recognition tests, a probability scale was used to measure confidence ratings and is described later in this chapter.

### **Latency**

Latency is the length of time elapsed between administration of a memory test and initiation of a response. Latency and accuracy are generally found to be positively correlated; that is, longer response time (latency) is generally associated with higher accuracy, whereas shorter response time (latency) is associated with lower accuracy (Murdock 1982). This relationship is commonly referred to as 'speed-accuracy trade-off'

(Murdock 1982). Murdock (1982) argues that an accuracy measure without a latency measure is an incomplete evaluation of the retention test performance because there is no guarantee that greater accuracy was not due to longer reaction time. While this argument is valid and while the positive relationship suggests that latency be used as a supporting measure of accuracy, there are several associated problems of using the latency measure.

First, the positive relationship between latency and accuracy does not hold at all levels of latency. At higher levels of latency, the speed-accuracy function shows either a near-zero or even negative correlation between accuracy and latency (Murdock 1982). Thus, unless the upper limit of the response time is restricted, using latency as a supporting measure of accuracy may become erroneous.

Second, response times may be only a few fractions of a second different. Thus, the latency measure is highly sensitive to the instrument used. In absence of a timing mechanism that measures in milliseconds, the latency measures are less likely to be good supporting measures of accuracy.

Third, latency is believed to be dependent upon several factors other than accuracy. Previous investigations show that latency is a function of the size of the test set, serial position of the correct item in a forced-choice recognition test, and the time lag between initial exposure of stimulus items and the test (Klatzky 1980; Murdock 1982). Although these factors could be controlled for across different experimental conditions, latency was not used as a supporting measure of accuracy prima-

rily due to non-availability of an appropriate time measuring device, and the difficulty of controlling the moderating variables listed above.

### Hypotheses

As described above, the two measures used for evaluating memory test performance were accuracy and confidence. These two measures are used to state the hypotheses in operational terms. However, before the hypotheses are stated, it may be useful to recapitulate the levels of independent variables, even though the detailed descriptions about their inductions are presented later in this chapter.

"Intention to learn" has two levels; in one, the learning intention is present (intentional learning), and in the other, it is absent (incidental learning). The "choice task orientations" have three levels; in one level, the task orientation involves making a choice on the basis of non-price factors (non-price choice task), in the other, the choice is made on the basis of price-related factors (price-based choice task). There is an intermediate level, a mixed choice task condition where the subjects use both price as well as non-price factors to make a purchase decision. With this brief description as to how the levels of independent variables were manipulated, it is possible to comprehend more clearly the hypotheses stated below.

### **Effect of Learning Intention**

H1 through H4 below capture the effect of learning intention on recall and recognition test accuracy and confidence:

- H1: The price recall accuracy for subjects with intentions to learn will be greater than the price recall accuracy for subjects without such learning intentions.
- H2: The rated confidence judgment that the recalled price is correct will be greater for subjects with intentions to learn than for subjects without such learning intentions.
- H3: The accuracy of subjects without intentions to learn will be greater in a price recognition test than in a price recall test.
- H4: The subjects without intentions to learn will exhibit greater confidence about their price recognition accuracy than their confidence about price recall accuracy.

### **Effect of Choice Task Orientations**

H5 through H10 below capture the effect of the nature of choice tasks on recall, recognition, and relative recall performance:

- H5: The accuracy in an exact price recall test will be greater for subjects performing a price-based choice task than for subjects performing a non-price based choice task.
- H6: The confidence that their recalled price is correct will be greater for subjects performing price-based choice task than for subjects performing a non-price based choice task.
- H7: The accuracy in a price recognition test will be greater for subjects performing a price-based choice task than for subjects performing a non-price based choice task.
- H8: The subjects performing a price-based choice task will exhibit greater confidence about their recognition accuracy than the subjects performing a non-price based choice task.

- H9: Subjects performing a price-based choice task will exhibit greater accuracy in a relative price recall test than in an exact price recall test.
- H10: Subjects performing a price-based choice task will exhibit greater confidence about their relative price recall accuracy than their exact price recall accuracy.

#### **Joint Effects of Learning Intention and Choice Task Orientations**

H11 through H16 below captures the mediating effect of choice task orientations on intentional learning:

- H11: Regardless of whether learning intention is present or not, subjects performing a choice task will on the average exhibit greater accuracy in a price recognition test than in an exact recall test.
- H12: Regardless of whether learning intention is present or not, subjects performing a choice task will on the average exhibit greater confidence about their price recognition accuracy than about their exact price recall accuracy.
- H13: Notwithstanding their intentions to learn prices for later recall, subjects performing a non-price based choice task will exhibit greater accuracy in a price recognition test than in an exact price recall test.
- H14: Notwithstanding their intentions to learn prices for later recall, subjects performing a non-price based choice task will exhibit greater confidence about their price recognition accuracy than about their exact price recall accuracy.
- H15: Subjects with intentions to learn prices for later recall and performing a price-based choice task will exhibit no less accuracy in an exact price recall test than in a recognition test.
- H16: Subjects with intentions to learn prices for later recall and performing a price-based choice task will exhibit no greater accuracy in a relative price recall test than subjects without such intentions and performing the same choice task.

## **RESEARCH METHODOLOGY**

The purpose of this section is to present the methodological procedures employed to test the hypotheses. With this objective in mind, the section is divided into five subsections. First, a broad statement of the overriding methodological aim of the research is presented and the requirements for valid causal inferences are discussed. The second subsection compares the different methods and in terms of their abilities to meet the requirements for causal inferences and presents an argument why an experimental method was chosen for the research. The third subsection provides the rationale for using a laboratory setting rather than a field setting for data generation. The fourth sub-section presents the research design and describes why a between-subjects design was used. Finally, the fifth sub-section describes the sampling procedures with specific focus on sample size determination, sampling characteristics, and assignment rules.

### **Methodological Objective**

Stated broadly, the overriding goal of this research is to examine causal interrelationships among theoretical constructs like price awareness, learning intentions, and choice task orientations. To achieve this objective, two important criteria must be met. First, the research methodology must allow the researcher to create and manipulate the constructs of interest in accordance with the theory. Second, the method-

ology must be appropriate to make causal inferences involving the theoretical constructs possible.

Causal relationship between two variables can be established if (1) there is a concomitant variation of the variables, (2) there is a temporal sequence of the cause occurring before the effect, and (3) there is no alternative explanation of the effect, other than the causing variable (Cook and Campbell 1979; Churchill 1984).

Thus, when the goal of a research is to establish a causal relationship among theoretical variables, as it is in this research, the overriding concern should be to choose a research methodology that (1) allows the researcher to observe concomitant variations of the dependent and explanatory variables, (2) permits temporal separation between the variables, and finally, (3) provides the researcher maximum confidence to rule out possible alternative explanation about the relationships (Cook and Campbell 1979). These are the issues of 'control' in that the researcher with the objective of making causal inferences should choose a research methodology that ensures maximum control in terms of observing changes in dependent variables as a result of manipulating levels of independent variables and avoiding interference from factors which are not of theoretical interest (Fromkin and Streufert 1976).

As will be seen in the subsequent discussion, some methodological criteria respond to these requirements of 'control' better than others. Obviously, this research favored the methodological criteria that would make interpretations of the research results less problematic and less ambiguous.

### **Research Method**

The term 'research method', as it is used in this section, does not include the entire gamut of research methodology. The focus here is to examine the mechanism through which data for this research will be generated. The two most commonly used methods for generating data in price awareness research have been survey and direct observation.

#### **Survey Method**

Most of the previous research in price awareness have used surveys either at the store setting or through in-home interviews (Gabor and Granger 1961; Progressive Grocer 1964, 1974, 1977; Allen, Harrell and Hutt 1976). To the extent these researchers were concerned in establishing relationships between observable variables (like demographic, products, and store characteristics) and price awareness, the choice of the method may seem appropriate. However, it was argued in Chapter II that variations in buyers' price awareness cannot be fully explained by observable factors and that understanding of cognitive dimensions of the buyers was necessary to address the research question more effectively. When cognitive factors are used as explanatory variables, survey methods are not always capable of establishing postulated relationships. For example, the data generated through a questionnaire survey cannot tell, except through self reports, whether respondents learned prices for later recall or whether they used price or non-price factors to make a purchase deci-

sion. Most importantly, in survey research, researchers have little control in manipulating the learning and task conditions either in a temporal sequence or at desired levels so as to make unproblematic inference possible.

Apart from the inability to manipulate the variables, there is the problem of alternative explanations. In survey research innumerable factors cannot be held constant, thus confounding the relationship and giving rise to the possibility of alternative explanations. For example, the survey method would not allow a researcher to tell whether greater price recall accuracy was due to variations of the theoretical factors, or due to other factors like demographics, product and store-related factors, differences in time taken for shopping, time elapsed between purchase and responding to the questionnaire.

### **Observational Method**

One of the problems of conducting research dealing with mental constructs is that the researchers do not have independent access to the respondents' minds (Rubenstein 1981; Nisbett and Wilson 1977). Behaviorists have dealt with the problem by eliminating the mental constructs from their ontology and have relied on observable facts for making inferences about human minds (Anderson 1986).

In price awareness research, Dickson and Sawyer (1986) and, to a limited extent, Zeithaml (1982) took a similar approach. Although learning intention and task orientations were not explicitly stated to

be their variables of interest, Dickson and Sawyer (1986) postulated that extensiveness of point-of-purchase and price-checking behavior would influence shoppers' recall accuracy. Zeithaml (1982) proposed that longer shopping time would produce greater elaboration of price information. While these observable factors may be considered to be surrogates of shoppers' learning and their choice task dimensions, it is nonetheless difficult for researchers to manipulate and control these factors to detect the differential effects. More importantly, these manifest criteria do not guarantee that the manipulations have worked at the cognitive level. For example, observed behavior at the point-of-purchase or time spent during shopping may not always mean that the cognitive processing of the price information has taken place at the desired levels.

### **Experimental Method**

In view of the inability of survey and observational methods to provide researchers the controls necessary for causal inference, this research turns to an experimental method. The controls that experiments afford an investigator are in respect of observing concomitant variations, ensuring temporal sequence, and avoiding interference from factors not related in the research (Kerlinger 1973; Churchill 1983).

This research investigates the effects of learning intentions and choice task orientations on buyers' price awareness. Employing an experimental method permits the researcher to create two levels of learning intention - one in which learning intention is present and the other where

it is absent. Similarly, the three levels of choice task orientations can be induced on subjects by suitably altering the choice criteria. In order to ensure that the manipulations have worked, independent procedures to check for manipulations can be employed.

Second, an experimental procedure allows researchers to create and control the 'range' of the independent variable where the effects can be captured (Cook and Campbell 1979). In this research, for example, the theory suggests that the influence of orienting tasks on learning is strong when the task is maximally favorable or maximally unfavorable, but not so strong at moderate levels of favorableness (Postman 1964). The experimental method allows the researcher to create such extreme conditions where the effects of the postulated relationship would be the strongest.

Third, the experimental method allows a researcher to minimize the effects of variables that are not of interest in the research. This can be done by selecting an homogeneous sample, random assignment of subjects to treatment conditions, presenting identical stimuli to all subjects in the same treatment, and by preventing variations of extraneous factors, either by eliminating them or by holding them constant. Stated simply, by employing experimental methods, researchers can best defend their inference because of their ability to remove the effects of interference as much as practicable (Fromkin and Streufert 1976).

Given the advantages of the experimental method, and considering that the goal of this research is to test theoretical relationships in a causal framework, it is clear that the experimental method can best re-

spond to the requirements of causality. Therefore, an experimental method was employed for this research.

### **Research Setting**

Experimental procedures can be carried out either in a laboratory environment or in a field setting. However, the matter of superiority of one setting over another has generated considerable debate in the context of how closely the setting resembles the real world (Fromkin and Streufert 1976). Some researchers have argued that efforts should be made to incorporate critical background factors from the real world environment into the laboratory setting (Sawyer, Worthing and Sendak 1979). However, others argue that when theory testing is of paramount interest, the setting that allows researcher to operationalize theoretical constructs and is free of extraneous sources of variations should be used regardless of its artificiality or lack of mundane realism (Calder, Phillips, and Tybout 1981).

Three issues were considered about both perspectives before deciding which setting was appropriate for this research. First, establishment of theoretical relationship in a causal framework was of primary importance of this research. Therefore, the value of the research effort could not be enhanced by making the study more realistic, if the setting used to increase realism threatened the validity of causal inference (Fromkin and Streufert 1976). Second, the setting of a study must not be so contrived that the constructs of interest lose all their meaning and rele-

vance. That is, certain phenomena can exist only in conjunction with some background factors. Study of such phenomena cannot therefore be carried out unless the setting permits the interaction of such background factors even though these factors per se are not under investigation (Lynch 1982). Third, the setting must provide a context, or a frame of reference to the subjects for making a construct meaningful and for interpreting the results within that context.

With these considerations in mind, this research chose a laboratory setting over a field setting because of the former's ability to provide greater confidence about the validity of the postulated causal relationship. Also, with the help of a suitable subject selection, cover story, and careful manipulations, it was possible to introduce task relevance and a frame of reference to the subjects in a laboratory condition.

### Research Design

The experimental design used in this research is shown in Figure 3. The two independent variables of interest - intention to learn and choice task orientations constituted the two factors of the research design. Consistent with the theory and keeping in mind the nature of the hypotheses under test, two levels of learning intentions (incidental and intentional learning) and three levels of choice task orientations (non-price based choice task, mixed choice task, and price-based choice task) were used. Since the objective of this research was to test the main effects as well as the joint effects of the two factors, the two

**Figure 3**  
**Research Design**

Learning Intention (Between Subjects)				
		Absent (Incidental Learning)	Present (Intentional Learning)	
Choice Task Orientations (Between Subjects)	Non-Price Task			
	Mixed Task			
	Price Task			

levels of intention to learn and three levels of orienting task favorableness were fully crossed, producing six experimental conditions in a 2 x 3 full-factorial design.

### Sampling Procedure

This sub-section examines three specific issues of sampling procedure. They are: sample size determination, sample characteristics, and procedure of assigning the subjects to treatment conditions.

#### **Sample Size Determination**

The decision regarding sample size was important because it would determine the power of the statistical test to detect the effects of the experimental manipulations. For a given effect size and for a given level of significance of a statistical test, the greater the number of observations per treatment, the greater is the power of the test to detect the effect due to that treatment (Cohen 1977; Rosenthal and Rosnow 1984). Effect size, as usually expressed, is a standardized index of the degree of departure from the null hypothesis of no effect (Cohen 1977; Sawyer and Ball 1981). Power of a test refers to the probability that the test is able to detect an effect when it is actually present (Cohen 1977).

One of the problems in making a priori calculation of the required sample size was in estimating the magnitude of the effect size. While previous studies involving relationships among same phenomena usually

provide an estimate, such studies were not available for this research stream. To overcome this problem, Cohen (1977) suggests using some qualitative benchmark such as small, medium, and large effect size depending upon the researcher's subjective evaluation.

Most of the hypotheses developed in this research involved testing of differences between proportions. Therefore, the appropriate effect size index was 'h' which is the difference between arcsine transformation of the two proportions (Rosenthal and Rosnow 1984). According to Cohen (1977), the 'h' for small, medium, and large effects are 0.20, 0.50, and 0.80 respectively.

After several iterative process to achieve adequate power, it was decided to use ninety subjects with fifteen subjects assigned to each cell in a between-subjects design (on both factors). Each subject were required to respond to memory tests involving prices of four selected items (although there was a total selection of six items, the first and the last selections were excluded from the memory test to eliminate the primacy and recency effects). Thus, for fifteen subjects there were sixty observations per cell. Assuming a significance level of 0.05 for one-tailed test, and assuming a medium effect size ( $h = 0.50$ ) of the postulated relationships, the power of each test was expected to be about 0.90 (Table 6.4.1, Cohen 1977). An a priori power of 0.90 was considered adequate and therefore a total sample of 90 was used with 15 subjects in each cell.

### **Sample Characteristics**

Following an editorial comment in the Journal of Consumer Research by the late Robert Ferber (1977) that using convenience samples is notoriously inadequate for generalizing the research results to other populations, the marketing literature witnessed a debate on the issue of sample selection in consumer research (Calder, Phillips and Tybout 1981, 1982, 1983; Lynch 1982, 1983). Several important issues that came out of this controversy were considered before making a decision about the kind of sample to use for this research.

First, when theory testing is the goal of a research, the sample that provides the most rigorous test of the theory at issue should be used (Calder, Phillips and Tybout 1981). This entails using subjects who are relatively homogeneous on nontheoretical variables (i.e. the variables which are not of interest in the research). A homogeneous sample helps to control for the difference in individual factors and therefore allows a more powerful statistical test (Campbell and Stanley 1966).

Second, the issue of generalizability includes not only extending the research results across the subject population (i.e., across all supermarket shoppers) but also generalizing across settings, methods, situations, and unenumerable number of other background factors (Lynch 1982). Thus, no single piece of research can produce results that can be generalized across all relevant populations (Lynch 1982; McGrath and Brinberg 1983).

Third, the sample selected for a study should be such that the tasks required to be performed in treatment conditions have relevance to the subjects (Ferber 1977). In other words, subjects who are more responsive to a given treatment should be used as opposed to the subjects who fail to associate themselves under such conditions.

Given these considerations about sample selections, it became apparent that using student subjects might not be appropriate. A preliminary investigation indicated that undergraduate students exhibit large variations in terms of their grocery shopping habits primarily due to their demographic factors like residence (on-campus or off-campus), employment status (full-time, part-time, or unemployed), and nature of financial support (self-supported or parent-supported). Most importantly, a large proportion of the undergraduate student population was not believed to be experienced in regular grocery shopping for their household and therefore, students perhaps might not involve themselves with the experimental tasks.

In view of the above reasons, it was decided to use non-student women grocery shoppers from various women's groups in Blacksburg as subjects for this research.

While variations due to demographic factors were present among this group of subjects as well, the selected subjects were believed to identify themselves with the task well. The profile of the subjects in terms of their demographics and their central measures are presented in Tables 6 and Table 7 respectively.

**Table 6**  
**Subjects' Demographic Profile**

<b>A. Income Groups</b>	<b>Number of Subjects</b>	<b>Percentage of Total</b>
a) Less than \$10,000	6	6.67%
b) Between \$10,000 and \$25,000	35	38.89%
c) Between \$25,000 and \$40,000	16	17.18%
d) Between \$40,000 and \$55,000	16	17.78%
e) Between \$55,000 and \$70,000	9	10.00%
f) Over \$70,000	4	4.44%
g) Did not Respond	<u>4</u>	<u>4.44%</u>
	<u>90</u>	<u>100.00%</u>

<b>B. Marital Status</b>		
Married	60	66.67%
Unmarried	<u>30</u>	<u>33.33%</u>
	<u>90</u>	<u>100.00%</u>

<b>C. Age Distribution</b>		
a) 21 to 30 years	27	30.00%
b) 31 to 40 years	36	40.00%
c) 41 to 50 years	13	14.44%
d) 51 to 60 years	7	7.78%
e) Over 60 years	6	6.67%
f) Did not Respond	<u>1</u>	<u>1.11%</u>
	<u>90</u>	<u>100.00%</u>

<b>D. Employment Status</b>		
Employed	60	66.67%
Unemployed	<u>30</u>	<u>33.33%</u>
	<u>90</u>	<u>100.00%</u>

<b>E. Auto-Use of Shopping</b>		
Yes	90	100.00%
No	<u>0</u>	<u>0.00%</u>
	<u>90</u>	<u>100.00%</u>

**Table 7**  
**Central Measures of Subjects' Demographic Factors**

**1. Number of persons in household:**

Mean:	2.71
Standard Deviation:	1.29
Maximum:	1
Minimum:	6
Median:	3

**3. Monthly Grocery Bill per household member:**

Mean:	\$93.54
Standard Deviation:	\$42.66

**3. Median Income Group: Between \$25,000 and \$40,000**

**4. Median Age: 34 years**

### **Assignment to Conditions**

Although the subjects were selected conveniently from various women's group in Blacksburg, they were randomly assigned to each of the six treatment conditions. Random assignment was necessary to eliminate systematic difference as an alternative explanation for the research results (Cook and Campbell 1976). Tests were carried out to detect if any systematic variations on demographic factors existed across different experimental conditions. The test results are reported and discussed in Chapter IV.

### **THE EXPERIMENTAL PROCEDURE**

Subjects after being randomly assigned to each of the six experimental conditions were presented with a cover story about the purpose of the research. The subjects then took part in a simulated grocery shopping where they were provided with the product and price information and were asked to make their selections based upon some specific choice criteria. The criteria used by the subjects were varied across the different conditions for choice task orientation. After completion of the shopping exercise, the product and price information was withdrawn and the subjects were given a series of memory tests involving the prices of the items selected in the same sequence as they made their product selections. The sequence of selections and memory tests were altered at random to avoid possible presentation order effects. The first and the

last selections were excluded from the memory tests to eliminate possible primacy and recency effects. Subjects were instructed not to look back at their previous responses in the memory tests. Before the memory test was administered, they responded to several questions that were used for checks of experimental manipulations. These questions also helped clear up short-term memory and make the cover story more credible.

After the memory tests, the subjects responded to two sets of questions. The first set of questions were designed to measure their price consciousness for grocery items. The second set of questions collected the subjects' demographic information.

Finally, the subjects were debriefed and thanked for taking part in the research. Each subject was paid five dollars as a token appreciation for their participation. The entire experimental process took about one hour.

Each aspect of the experimental procedure is expanded below. A brief description of the pre-experimental procedures and their effects on development of the instruments are also highlighted.

### Cover Story

The subjects were told that they were participating in research to examine their grocery shopping behavior in terms of how they evaluate different alternatives and make their purchase decisions. However, to avoid their personal preferences from interfering with the choice task manipulations, the subjects were instructed to carry out the shopping task

for a friend whose selection criteria were provided to them. The cover story (Figure 4) was sufficiently broad so as not to raise suspicion in the subjects' minds as to the real intent of the study. On the other hand, the story did not deviate from the actual research issue such that the deception implied within the story due to incomplete information about the research became an ethical issue.

### **The Stimulus**

The stimulus of this experiment consisted of attribute information of several grocery products which were used by the subjects to make their choice decisions. Several factors were considered to design the stimulus. These factors were: how many and what product categories to include, how many items within each product category to use, the format in which information was to be presented, amount of information to be provided, and the sequence in which the stimuli were to be presented. These issues are discussed next.

#### **Product Category**

Previous research in verbal learning and memory has typically used between 3 to 12 categories for adult subjects (Murphy and Puff 1982). Based on this finding, this research used the following seven packaged food product categories: (1) canned vegetables, (2) frozen orange juice (canned), (3) canned soup, (4) cold breakfast cereal, (5) pasta dinner,

**Figure 4**  
**Cover Story**



THE R. B. PAMPLIN COLLEGE OF BUSINESS

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

*Blacksburg, Virginia 24061*

Thank you for agreeing to participate in this research. We hope, you will find it to be an interesting experience.

The purpose of this research is to investigate how grocery shoppers evaluate different alternatives in a supermarket and how they decide on a particular item to purchase. We propose to do this by developing a situation where you will take part in a grocery shopping trip. However, you will be asked to do the shopping for a friend whose shopping habits may or may not match with your own. That is, instead of employing your own criteria for selecting different items in the store, you will be asked to use the selection criteria that characterize the friend you are going to shop for.

You will be provided with six booklets, each representing a food product category, like canned soup, cold breakfast cereal, and so on. Within each product category, there will be six items. Your task would be to make one selection from each of the six product categories based upon some specific guidelines and instructions. After you have made all six selections, you will be asked to respond to a few questions about your purchase decisions.

To familiarize you with the selection procedures and the criteria your friend uses to make a selection, there will be a practice session and you will have the opportunity to ask any questions that you may have about the task at that time.

Remember, how you make your selections and how you respond to the questions in no way reflect your ability, talent, or actual shopping habits. Your responses will be kept strictly confidential. Do not write your name anywhere in the booklets or the questionnaire.

When you have completed all aspects of this shopping experience, the researcher will provide a more detailed explanation about this investigation.

(6) margarine, and (7) salad dressings. The first product, canned vegetables, was used only to acquaint the subjects with the selection procedure. The other six products were used in the actual experiment (Figure 5).

There were several reasons for choosing the above product categories. First, all the products fell under the packaged food product category which allowed the researcher to provide product information on some common attributes and thus made the information format the same for all products. Such uniformity also helped the administration of the choice task manipulation simple in that the same choice task criteria applied for all seven products. Second, each product category offered a large number of items within that category so that the choice task became involving. Third, items within these product categories had sufficient actual variations in their prices so as to make the price-related choice task manipulations realistic. Finally, the subjects were expected to be familiar with these products and therefore would not feel alienated from the experimental task.

#### **Number of Items**

Drewnowski and Murdock (1980) suggested that the number of items within each category should be above the short-term memory span of  $5 \pm 2$  items. Otherwise, perfect recall in the order of presentation may result, leaving no room for the treatment effect. Previous research in verbal learning has typically used between 5 to 10 items per category for adult

**Figure 5**  
**Product Categories Used in the Experiment**

<u>Product Categories</u>	<u>Comments</u>
1. Canned Vegetables	Used in the practice session
2. Margarine	used in actual experiment
*3. Frozen Orange Juice	used in actual experiment
*4. Canned Soup	used in actual experiment
*5. Cold Breakfast Cereal	used in actual experiment
*6. Pasta Dinner	used in actual experiment
7. Salad Dresing	used in actual experiment

\*These four products were included in the memory test.

subjects (Murphy and Puff 1982). This research used six items (Figure 6) in each product category either of the same brand (in canned vegetables, canned soup, cold breakfast cereal, and salad dressings), or of different brands (in orange juice, pasta dinner, and margarine).

### **Stimulus Format**

Three possible alternative stimuli were considered for this experiment: actual product with item price, package labels with item price, and product and price information in a matrix format. When actual product or package labels constitute the stimuli, there may be at least three important variations which may produce differential impact on subjects' information processing and memory performance. They are: color and sizes of the stimuli, the nature and amount of information provided on the labels, and the item or brand names themselves. While the effects of color and sizes of the stimuli could be eliminated by presenting black and white reproductions of the stimuli and by making the sizes of the stimuli identical, the variations due to nature and amount of information on each product labels could not be controlled for. In order to avoid such variations, it was decided to present the stimulus information for each product category with the help of an information chart in a matrix format. The information chart included the relevant product and price related information which were required by the subjects to complete the choice tasks.

**Figure 6**  
**Items in Each Product Category**

- 0. CANNED VEGETABLE**
  - Cut Beets
  - Julienne Carrots
  - Whole-Leaf Spinach
  - Mixed Vegetables
  - Sweet Peas
  - Cut Green Beans
  
- 1. MARGARINE**
  - Fleischmann's Light
  - Shedd's Spread
  - Blue Bonnet
  - Kroger Margarine
  - Premium Mazola
  - Land O Lakes
  
- 2. PASTA DINNER**
  - Deluxe Macaroni & Cheese
  - Egg Noodle with Chicken
  - Creamy Pasta
  - Velveeta Shells & Cheese
  - Cheese Supreme
  - Macaroni & Cheese
  
- 3. COLD BREAKFAST CEREAL**
  - Raisin Bran
  - Corn Flakes
  - All-Bran Fruit and Almonds
  - Raisin Square
  - Just Right
  - Frosted Mini-Wheats
  
- 4. CANNED SOUP**
  - Curly Noodle with Chicken
  - Cream of Asparagus
  - Chicken Broth
  - Creamy Chicken Mushroom
  - Tomato Bisque
  - Chunky Chicken Vegetable
  
- 5. FROZEN ORANGE JUICE**
  - Citrus Hill
  - Florida Gold
  - Sun Gold
  - Seneca
  - Minute Maid
  - Kroger
  
- 6. SALAD DRESSINGS**
  - Creamy Cucumber
  - Roca Blue
  - Catalina Spicy Sweet
  - Presto Italian
  - Thousand Island
  - French

As regards the item or brand names, it was recognized that subjects' prior knowledge of prices and other attribute information of the items or brands might interfere with the choice tasks as well as memory test performance. A preliminary test was carried out using twelve subjects (two in each cell) to examine how the information chart without the item or brand name (Figure 7) would work. An interview with the subjects after the experiment indicated that somewhere during the process of selections, they lost interest in the choice task. More importantly, several subjects complained that they lost track of what they were selecting and how their selections were associated with the selection criteria specified. It appeared that for such large number of choice alternatives, unless the subjects could visualize the product or brand, it was difficult to remain involved in the choice task because the process of selections ended up being purely a mathematical exercise.

In view of this finding, it was decided to keep the actual item or brand names in the information chart. However, to avoid subjects' prior knowledge from interfering with the choice tasks and memory tests, they were told that the information provided may not match with the actual attribute information of the items. In fact, the prices of different items were altered to eliminate the effect of prior knowledge of prices from influencing the memory test performance. Moreover, by instructing the subjects to make their selections for another person based on some specific choice criteria, helped reduce the personal preferences and minimize the effect of item or brand names in their selection process and memory tests.

Figure 7

## Information Chart Without Item Names

CANNED SOUP									
Items	Price Per Can	Net Weight Per Ounce	Unit Price Per Ounce	Servings Per Can	Calories Per Can	Fat Content Per Can	Carbohydrate Content Per Can	Sodium (Salt) Content Per Can	Proteins Content Per Can
A	45c	10.50	4.29c	2.50	175	20	23	2640	15
B	55c	10.75	5.12c	2.75	248	14	30	2475	6
C	69c	10.75	4.56c	2.75	96	6	6	2063	3
D	59c	10.75	5.49c	2.75	330	22	25	2585	17
E	65c	11.00	6.82c	2.75	330	6	63	2283	6
F	69c	10.75	7.35c	1.00	240	11	20	261	15
									212

## **Nature and Amount of Information**

As discussed before, different choice task conditions required usage of different attribute (price or non-price) information for making selections. The price-related information included item prices, item weights, and number of servings per container. The non-price attributes included calorie and nutritional information. To determine the nature and amount of information to be provided in the information chart, two pre-tests were conducted.

### **Pre-test 1**

The first pretest presented the subjects with information charts which had a total of eleven pieces of information in each product category (Figure 8). The non-price-based choice task involved using six pieces of information (calorie, fat, carbohydrate, sodium, proteins, and vitamin contents) determine the most nutritious alternative. The price-based choice task involved choosing the lowest-priced item. In effect, the subjects in this group could make their selections by using only the unit price information without even looking at the item prices. The mixed choice task required the subjects to use all ten bits of information to make a 'best buy' decision. The total time taken for each choice task was calculated and compared (Table 8). It became clear that there were systematic differences in the processing time across different choice task conditions. The mixed choice task group required the longest time, then the non-price task group, and then the price task. In fact, for the

Figure 8

**Information Chart Used in Pretest 1**

CANNED SOUP											
No.	Items	Price Per Can	Net Weight (Ounces)	Unit Price Per Ounce	Servings Per Can	Calories Per Can	Fat Content Per Can	Carbohydrate Content Per Can	Sodium Content Per Can	Proteins Content Per Can	Vitamins (Aggregate)
1.	Campbell's Curly Noodle with Chicken	45c	10.50	4.29c	2.50	175	20	23	2640	15	103
2.	Campbell's Cream of Asparagus	55c	10.75	5.12c	2.75	248	14	30	2475	6	44
3.	Campbell's Chicken Broth	49c	10.75	4.56c	2.75	96	6	6	2063	3	22
4.	Campbell's Creamy Chicken Mushroom	59c	10.75	5.49c	2.75	330	22	25	2585	17	74
5.	Campbell's Tomato Bisque	65c	11.00	6.82c	2.75	330	8	63	2283	6	143
6.	Campbell's Chunky Chicken Vegetable (Low Sodium)	69c	10.75	7.35c	1.00	240	11	20	261	15	212

**Table 8**

**Selection Time Across Choice Task Conditions Using  
Information Chart in Figure 8 (Pretest 1)**

	<u>Mean (seconds)</u>	<u>S.D. (seconds)</u>
Non Price Based Choice Task (N=18)	584.67	105.99
Mixed Choice Task (N=19)	667.84	127.47
Price-based Choice Task (N=17)	370.76	105.89

Selection time difference is significant at  $p = 0.0001$  ( $F = 31.47$ ;  $df = 2, 50$ )

price task group, the selections were completed in such a short period of time, that the subjects did not seem to pay much attention to the item prices. Perhaps because of this reason, subjects in this group performed worse in the memory tests than the subjects in the mixed choice task group (Table 9). An interview with the subjects after the experiment confirmed this finding.

#### Pre-test 2

The first pre-test results indicated that the different amount of information needed for different choice task conditions might influence the information processing and therefore, their memory test performance. In other words, the amount of information used for different choice tasks may be a potential source of confound.

To reduce the effects of processing different amounts of information, it was decided to have subjects in each choice task conditions use approximately the same amount of information. The information chart used for the second pre-test is presented in Figure 9. The subjects in the non-price choice task condition were now required to weigh the nutritional values of different items against their calorie contents; the mixed task group weighed nutritional values against the items' prices. The price-based task required subjects to choose the lowest unit price item using the item prices and their respective weights. All three groups were required to use number of servings. Thus, each task group used three bits of information to make their choice decisions. To check for the difference in shopping time across choice task conditions, the mean times were com-

**Table 9**

**Memory Test Performance Across Choice Task Conditions  
Using Information Chart in Figure 8 (Pretest 1)**

<b><u>Task Conditions</u></b>	<b><u>Memory Tests</u></b>	<b><u>Number Correct</u></b>	<b><u>Proportion Correct</u></b>
Non-Price based Choice Task	Recall (N=76)	21	27.63%
	Recognition (N=67)	31	46.27%
Mixed Choice Task	Recall (N=76)	35	46.05%
	Recognition (N=65)	39	60.00%
Price-based Choice Task	Recall (N=72)	26	36.11%
	Recognition (N=62)	34	54.84%

**Figure 9**

**Information chart Used in Pretest 2**

**CANNED SOUP**

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (' ) Per Can
CURLY NOODLE WITH CHICKEN	Campbell's	10	45¢	2.00	175	103
CREAM OF ASPARAGUS	Campbell's	12	55¢	2.75	248	67
CHICKEN BROTH	Campbell's	11	49¢	2.50	96	44
CREAMY CHICKEN MUSHROOM	Campbell's	10	59¢	2.00	200	103
TOMATO BISQUE	Campbell's	11	65¢	2.50	330	210
CHUNCKY CHICKEN VEGETABLE	Campbell's	11	69¢	1.00	240	200

pared (Table 10). The results showed that the differences in shopping time were now reduced, although the difference was still statistically significant at 0.05 level. However, it was decided to use this information chart for the actual experiment and to check if total shopping time had a significant effect on memory test performances across conditions. The test results are discussed in Chapter IV.

#### **Sequence of Stimulus Presentation**

The stimuli information were contained in seven booklets, one for each product category. The booklets were numbered from no.0 through no.6. As mentioned before, booklet no.0 (relating to canned vegetables) was used to give the subjects an opportunity to acquaint themselves with the selection procedure. Although the other six booklets (no.1 through no.6) were used in the actual experiment, subjects were not tested on the prices contained in booklet no. 1 (Margarine) and booklet no. 6 (Salad Dressings). That left the researcher with four products (Frozen Orange Juice, Canned Soup, Cold Breakfast Cereal, and Pasta Dinner) which were required to be presented in a predetermined sequence so that the memory tests could be administered in the same sequence.

It was recognized that presenting the four booklets to all subjects in the same sequence might give rise to an order effect either due to fatigue or due to practice. To remove the effect of order of presentation, it was decided to alter the sequence across the fifteen subjects in each experimental conditions. Four products could be arranged in

**Table 10**

**Selection Time Across Choice Task Conditions Using  
Information Chart in Figure 9 (Pretest 2)**

	<u>Mean (seconds)</u>	<u>S.D. (seconds)</u>
Non-Price Based Choice Task (N=13)	614.00	136.88
Mixed Choice Task (N=14)	559.57	172.46
Price-Based Choice Task (N=14)	451.21	174.97

The time difference is significant at  $p = 0.05$  ( $F = 3.43$ ;  $df = 2.37$ )

twenty four different sequence. Out of these twenty four sequences, fifteen sequences were picked at random (Figure 10) so that each subject in a cell received a different order of booklets. However, subjects across different conditions went through the same sequence for making their selections.

#### **MANIPULATION OF CHOICE TASK ORIENTATIONS**

As discussed in Chapter II, shoppers differ in terms of their perceived importance of price and non-price factors in a given choice task (Guiltinan and Monroe 1980; Dickson and Sawyer 1986). Because of such differences, buyers tend to provide different degrees of attention to and processing of price and non-price information that is available during the choice decision making process. This research used three levels of choice task orientations: (1) non-price-based choice task, (2) price-based choice task, and (3) mixed choice task. Procedure for inducing each of these choice task conditions are described next.

##### **Non-Price Based Choice Task**

Dickson and Sawyer (1986) found in their investigation that in supermarket shopping, over sixty-nine percent shoppers of these did not check prices because price was "not that important" (p. 16). Indeed, buying decisions may be influenced by a number of non-price factors which distract buyers from the prices. In this research, the non-price choice

**Figure 10**  
**Sequence of Stimulus Presentation**

<u>Sequence 1</u>	<u>Sequence 2</u>	<u>Sequence 3</u>
Orange Juice Canned Soup Breakfast Cereal Pasta Dinner	Orange Juice Canned Soup Pasta Dinner Breakfast Cereal	Orange Juice Breakfast Cereal Canned Soup Pasta Dinner
<u>Sequence 4</u>	<u>Sequence 5</u>	<u>Sequence 6</u>
Orange Juice Pasta Dinner Canned Soup Breakfast Cereal	Orange Juice Breakfast Cereal Pasta Dinner Canned Soup	Canned Soup Orange Juice Breakfast Cereal Pasta Dinner
<u>Sequence 7</u>	<u>Sequence 8</u>	<u>Sequence 9</u>
Canned Soup Orange Juice Pasta Dinner Breakfast Cereal	Canned Soup Pasta Dinner Breakfast Cereal Orange Juice	Breakfast Cereal Orange Juice Canned Soup Pasta Dinner
<u>Sequence 10</u>	<u>Sequence 11</u>	<u>Sequence 12</u>
Breakfast Cereal Canned Soup Pasta Dinner Orange Juice	Breakfast Cereal Orange Juice Pasta Dinner Canned Soup	Breakfast Cereal Pasta Dinner Canned Soup Orange Juice
<u>Sequence 13</u>	<u>Sequence 14</u>	<u>Sequence 15</u>
Pasta Dinner Orange Juice Canned Soup Breakfast Cereal	Pasta Dinner Canned Soup Orange Juice Breakfast Cereal	Pasta Dinner Breakfast Cereal Canned Soup Orange Juice

task was induced by instructing subjects to make purchase decisions based on nutritional information. In order to ensure that the induction was effective two pre-tests were conducted.

#### Pre-test 1

In the first pre-test subjects in the non-price condition were asked to assume that they were health conscious shoppers and, therefore, to choose items that were low on calories but high on nutritional value. In effect, the subjects were to weigh the nutritional values of different items against their calorie contents and select the items that provide the best combination of calorie and nutrition (Figure 11). Although the induction seemed to work well, there were a few subjects who continued to use their personal criteria while making their selections. To eliminate such an artifact and to strengthen the manipulation, the choice task instruction was marginally modified and tested in the second pretest.

#### Pre-test 2

The second pretest retained the same two criteria (calorie and nutritional value) for selection, but the subjects were asked to make the selections for a friend rather than for themselves. The friend was described as a health conscious person who wanted to minimize calorie intake but maximize the nutritional value from the food items she chooses (Figure 12). Also, the subjects were repeatedly reminded to ignore their personal

**Figure 11**

**Non-Price Based Choice Task Induction Used in Pretest 1**

The six food items that you are going to purchase is for your own consumption. Assume that you are a buyer who is extremely conscious of his/her health and nutritional values of the food items he/she buys. Therefore, you desire to reduce the calorie intake and are careful about the items' fat, carbohydrate, and salt (sodium) contents. However, you want to obtain as much nutritional values (in terms of proteins and vitamins contents) from your food as possible.

All the nutritional information will be available to you. But, the package sizes of items may vary for some of the product categories. Therefore, you may have to convert the nutritional information to some comparable units. However, you cannot use a calculator, nor can you carry out written computations.

Based upon the above scenario, select an item from each of the six product categories.

**Figure 12**

**Non-Price Based Choice Task Induction Used in  
Pretest 2 and in the Actual Experiment**

Your friend is extremely conscious of her health and nutrition. She watches her weight carefully and performs regular work-outs. When it comes to buying food products, she is not concerned about their prices but she pays a very close attention to calorie and nutritional information and selects the items that are low on calories but high on nutritional values.

The calories generally come from fats, sugar, and carbohydrate contents of the food, whereas the nutritional value mainly comes from the protein and vitamins. Information regarding the calorie contents and the nutritional values of the different items will be provided to you later in the booklets.

A dilemma that a health conscious shopper faces in deciding which item to buy is that the food with low calorie content does not necessarily provide the required nutritional value. Also, the food with high nutritional value does not always ensure low calories. Given this kind of a dilemma, you have decided that you can best serve your friend by carefully examining both the calorie content and the nutritional value of different items and selecting the item that gives the best possible combination of calorie and nutritional value.

However, if you find two items having the same or similarly attractive combinations of calorie and nutrition, you would select the more reputable brand.

tastes and preferences as much as possible. This modification helped reduce subjects' personal preferences from interfering with the task manipulation and therefore was used in the actual experiment. Moreover, many subjects reported that they could easily relate the friend's description with someone they knew which made the task somewhat more meaningful.

#### **Mixed Choice Task**

The mixed choice task was induced by describing the 'friend' as an involved homemaker who was interested in providing as much nutrition for her family members as possible but at the same time, she was concerned about the prices of different items so as to be able to remain within her shopping budget. In effect, the subjects had to weigh the nutritional values of different items against the prices to make their selections (Figure 13).

#### **Price-Based Choice Task**

The price-based choice task was induced by depicting the 'friend' as an extremely price conscious shopper for whom low price is the only criterion for choice decisions. The subjects were required to use the item price and the weight (or number of servings) to determine with the lowest price unit (or serving). This involved paying attention to all the prices and mental calculation of unit prices (Figure 14).

**Figure 13**  
**Mixed Choice Task Induction**

Your friend is an involved home-maker. She plans her menu, prepares a shopping list before shopping, and tries to stay within her shopping budget. When it comes to buying food products, she wants to buy the items that can provide adequate nutritional value to the members of her family and at the same time she is very careful about the prices she pays. She is not concerned about the calorie contents of different food items but she would buy the items that are high on nutritional values but low on price.

The nutritional value primarily comes from protein and vitamin contents of the food items. The information regarding the nutritional values and prices of the different food items will be provided to you later in the booklets.

A dilemma that a nutrition- and price-conscious shopper faces in deciding which item to buy is that the items with high nutritional values are not always available at acceptable prices. Conversely, the items with low prices do not always provide the desired nutrition. Given this kind of a dilemma, you have decided that you can best serve your friend by carefully examining both the prices and the nutritional values of different items and selecting the item that gives the best possible combination of price and nutritional value.

However, if you find two items having the same or similarly attractive combinations of price and nutritional value, you would select the more reputable brand.

**Figure 14**  
**Price-based Choice Task Induction**

**Your friend is an extremely price-conscious shopper.** She loves to shop around for bargains and selects stores because of the low prices they offer. She is not concerned about the calorie contents or the nutritional values of different food items, but she pays a very close attention to the prices of different items to find out how the items rank against each other in terms of their expensiveness. Such ranking helps her identify the items that fall within her acceptable price limit. However, she does not necessarily select the lowest-priced item because she is aware that the items may vary in terms of their contents, weights, and sizes.

Some stores provide on the shelves the unit prices (for example, price per ounce) which make the price comparison easier for such price-conscious shoppers. Unfortunately, the store you are now going to visit does not give you the unit price (price per ounce) information. This makes it difficult for you to carry out the kind of price comparison your friend expects you to do. Given this kind of a situation, you have decided that you can best serve your friend by carefully examining both the prices as well as the weights of different food items and selecting the item that provides the best possible combination of price and weight.

However, if you find two items having the same or similarly attractive combinations of price and weight, you would carefully consider the item or brand names and select the most reputable brand because your friend will perceive it to be a bargain.

## **MANIPULATION OF LEARNING INTENTION**

To recapitulate, this research has conceptualized two types of learning - intentional learning and incidental learning. Intentional learning of price information takes place when shoppers exhibit a specific intent to memorize information for later recall (Bettman 1979b). In incidental learning, later recall of information is not the processing goal (Biehal and Chakravarti 1983). Learning of target information may or may not take place depending upon the nature of the task performed during the process of learning. The inductions of these two types of learning are described below.

### **Intentional Learning**

At the methodological level, intentional learning generally has been operationalized by presenting the subjects with stimulus information and forewarning them that there will be a recall test at the end of stimulus presentation (Postman 1964; Eagle and Leiter 1964; Eysenck 1982). Thus, presence of a prelearning instruction about an impending recall test is generally considered to be an appropriate operational definition of intentional learning (McLaughlin 1965).

Intentional learning was operationalized in this research by asking the subjects to assume that they were to visit another store to compare the prices they paid in the current store. Subjects were alerted that at the next store, the prices of the previous store would not be available.

Therefore, they would need to remember the prices to make such price comparisons possible (Figure 15).

One concern of the above operationalization of intentional learning was that the subjects might be so preoccupied with memorizing the prices that the task manipulation would be washed out. To avoid such a situation, the subjects were also told that after the shopping, they would have to explain to their friend that they had indeed followed the choice criteria specified apart from being able to remember the prices.

### **Incidental Learning**

Incidental learning usually has been operationalized by presenting the subjects with the stimulus information, but they are not forewarned about a subsequent memory test (Postman 1964; Eysenck 1982). Thus, absence of a prelearning instruction about an impending memory test constitutes an operational induction of incidental learning (McLaughlin 1965).

This research operationalized incidental learning by instructing subjects to make purchase decisions based upon different choice criteria but they were not alerted about the subsequent memory tests on the prices of the items they selected. Thus, the learning that would take place under this condition would be in the course of the choice task.

**Figure 15**  
**Intentional Learning Induction**

Apart from making selections based on the above criteria, assume that after this shopping trip, you are going to visit another store where your friend normally goes for her grocery shopping. The only reason for your visiting this other store is to check if the prices at this store are more, less, or the same as the prices you paid for your purchases. To do that, you will have to remember the prices of the items that you are going to select because at the next store, the prices of the first store will not be available.

Given the above scenario, you should be prepared to do two things after completing your shopping trip. First, you should be prepared to explain to your friend that you have indeed followed her selection criteria described in "3" above while making the selections. Second, you should be in a position to remember the prices of the items you selected for her so that she can compare these prices herself against the prices she normally pays at her favorite store described above.

### **Manipulation Checks**

To ensure that the choice task and learning manipulations worked as intended, subjects responded to two sets of question. The first set of questions assessed the degree to which they used and paid attention to the different information provided in the booklets when making their selections (Figure 16). The second set of questions evaluated subjects' preparedness about the memory tests and the extent to which they tried to memorize prices for latter recall (Figure 17). The latter set of questions also helped verify if some subjects in the incidental learning group had guessed the hypotheses and tried to memorize prices despite the absence of such instructions. The strength of the manipulations were evaluated and the results are discussed in the next chapter.

### **MEMORY TESTS**

It was indicated earlier that although each subject made a total selection of six items, they were tested on the prices of only four of the six selected items. The first and the final selections were excluded from the memory test to avoid the primacy and recency effects.

Second, the memory tests were administered in the same sequence in which the stimulus information was presented. In other words, if the booklet containing product and price information of canned soup was presented first, the memory tests involving prices of the selected canned soup were administered first, and so on. However, the order of presen-

**Figure 16**

**Items for Checking Manipulation of Choice Task Orientations**

In the booklets, you were presented with seven different pieces of information about the items in each product category. You were also instructed to make your selections on the basis of a friend's selection criteria. This section tries to determine the extent to which you used the information provided.

- A. Please indicate the extent to which you used the following pieces of information during the selections. Please place a cross (x) in the appropriate space in each row below that best describes your response.

	Never used the informa- tion	Moderately used the information	Always used the informa- tion		
	1	2	3	4	5

1. NUTRITIONAL VALUES

2. CALORIE CONTENTS

3. NUMBER OF SERVINGS

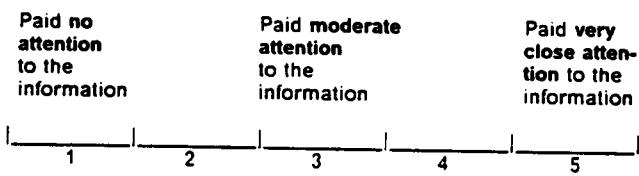
4. PRICES

5. NET WEIGHTS

6. MANUFACTURERS' OR  
DISTRIBUTORS' NAMES

7. NAMES OF THE ITEMS

- B. Please indicate the extent you paid attention to the following pieces of information during the sections. Please place a cross (x) in the appropriate space in each row below that best describes your response.



1. NUTRITIONAL VALUES

2. CALORIE CONTENTS

3. NUMBER OF SERVINGS

4. PRICES

5. NET WEIGHTS

6. MANUFACTURERS' OR DISTRIBUTORS' NAMES

6. NAMES OF THE ITEMS

**Figure 17**  
**Items for Checking Manipulation of Learning Intentions**

This section assesses the extent to which you attempted to remember the prices of the items you selected.

Please indicate the extent to which you agree with the statements below by placing a cross (x) in the appropriate spaces:

Completely Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Completely Agree
------------------------	----------------------	-------------------------------------	-------------------	---------------------

--	--	--	--	--

1. I tried to remember the prices of the items selected.

--	--	--	--	--

2. I did not make an attempt to remember the prices of the items selected.

--	--	--	--	--

3. I paid no attention to the prices of items I did not select.

--	--	--	--	--

4. I knew that I would be asked to remember the prices of the items selected.

--	--	--	--	--

tation of stimuli and therefore, the order of memory tests were changed at random to eliminate a systematic presentation order effect. Third, apart from controlling the order of stimuli presentation and memory tests, the research also recorded the time for selecting each item (encoding time), the time between stimulus presentation and commencement of the corresponding memory test (elapsed time), and the time taken to respond to the memory tests (latency). These time measures were used to examine if there existed relationships with memory test performance even though no hypotheses involving such relationships were proposed.

With these three issues addressed, it is now possible to describe the actual memory tests administered. This research used the following tests in the same temporal order: (1) exact price recall test, (2) relative price recall test, and (3) price recognition test. The relative price recall test was placed in between the exact price recall and recognition to reduce the effect of the recalled prices from influencing the recognition tests.

#### Exact Price Recall

As described before, recall involves reconstruction of previously encountered stimuli without any external aid (Bettman 1979b). This research administered the exact price recall test by asking the subjects to write the prices of the items they selected. The subjects who could not recall were forced to write their best estimates (Figure 18). Subjects

**Figure 18**  
**Exact Price Recall Test**

1. The following questions relate to the can of SOUP you had selected.

1. Please go back to the "Selection Card" and write below the name of the selected can of soup.
- 

2. Please write the current time below:

Hours	Minutes	Seconds

3. Can you recall the price of the can of soup you selected? If yes, write the price below. If you cannot recall the price, give your best estimate. Please write only in one of the two spaces below. Do not write on both.

Recalled Price: \_\_\_\_\_; or Estimated Price: \_\_\_\_\_.

4. Using the scale given earlier, indicate how sure you are that the recalled or estimated price is correct.

Your level of surety that  
the recalled or estimated price  
in "3" above is correct

\_\_\_\_\_ % Sure

were also required to indicate their level of confidence or certainty that the recalled or estimated price was correct.

### Price Recognition

Recognition involves distinguishing the correct stimulus from among the incorrect ones. This research used a combination of "yes/no" and "forced-choice" tests involving six alternative prices. The six prices were the actual prices of the six items within the product category and included the price of the item selected. The distractor prices were the prices of the items not selected (Figure 19).

In selecting the distractor prices, it was critical that these prices did not provide any additional cues to the subjects than were intended. Subjects might receive cues from the first and the last digits of the distractor prices. For example, if the actual price of an item was \$1.25, at least two of the distractor prices must begin with \$1 and end with 5 cents. Otherwise, some subjects could discriminate the distractor prices simply on the basis of these cues. In order to ensure that the recognition test did not provide the subjects with unintended cues involving the first and last digits, the prices of the six items were set accordingly (Figure 20). The serial positions of the actual price in the recognition varied depending upon the item selected by the subjects.

Apart from identifying the correct prices, subjects were also required to indicate their levels of confidence or certainty that the identified prices were correct. The subjects also indicated their levels

**Figure 19**  
**Price Recognition Test**

4. Following are six prices for a can of soup. These six prices include the correct price of the can of soup you had selected. Please do the following:

(1) Identify the correct price of the can of soup you had selected and place a cross (x) in the corresponding "Yes" column. Then, go to the last column and indicate your level of surety that the price you have identified as correct is indeed the **correct** price.

Please remember that only one of the six prices is correct. Therefore, you should place no more than **one** cross (x) in the "Yes" column.

Prices	Place an "x" in the appropriate spaces to indicate your responses.	Your level of surety that each of your responses in the previous Yes or No columns is correct.
69¢	<input type="checkbox"/> Yes; <input type="checkbox"/> No	<input type="checkbox"/> % Sure
65¢	<input type="checkbox"/> Yes; <input type="checkbox"/> No	<input type="checkbox"/> % Sure
59¢	<input type="checkbox"/> Yes; <input type="checkbox"/> No	<input type="checkbox"/> % Sure
49¢	<input type="checkbox"/> Yes; <input type="checkbox"/> No	<input type="checkbox"/> % Sure
55¢	<input type="checkbox"/> Yes; <input type="checkbox"/> No	<input type="checkbox"/> % Sure
45¢	<input type="checkbox"/> Yes; <input type="checkbox"/> No	<input type="checkbox"/> % Sure

- (2) Place a cross (x) in the "No" column for each of the other five prices to indicate that these five prices are **not** the correct prices of the can of soup you had selected. Then, go to the last column and indicate how certain you are that **each** of these five prices are indeed the **incorrect** prices.

**Figure 20**  
**Item Prices Used in the Experiment**

<u>Frozen Orange Juice</u>		<u>Canned Soup</u>	
Citrus Hill	95¢	Curly Noodle with Chicken	45¢
Florida Gold	93¢	Cream of Asparagus	55¢
Sun Gold	89¢	Chicken Broth	49¢
Seneca	83¢	Creamy Chicken Mushroom	59¢
Minute Maid	99¢	Tomato Bisque	65¢
Kroger	85¢	Chunky Chicken Vegetable	69¢

<u>Breakfast Cereal</u>		<u>Pasta Dinner</u>	
Raisin Bran	\$1.93	Deluxe Macaroni & Cheese	\$1.13
Corn Flakes	\$1.73	Egg Noodle with Chicken	\$1.23
All-Bran Fruit & Almonds	\$1.79	Creamy Pasta	\$1.03
Raisin Square	\$1.99	Velveeta Shells & Cheese	\$1.09
Just Right	\$1.53	Cheese Supreme	\$1.29
Frosted Mini-Wheats	\$1.59	Macaroni & Cheese	\$1.19

of confidence or certainty that the prices they thought were incorrect were indeed the incorrect prices.

#### Relative Price Recall

The relative price recall test required the subjects to rank the six items in each product category in terms of their expensiveness. Subjects were to rank an item as 1 if they thought that the price of the item was the lowest and 6 if they thought it was the most expensive item, and so on (Figure 21). Apart from ranking the items, subject were also required to indicate their levels of confidence or certainty for each of their ranking responses.

#### Confidence Rating Scale

As discussed above, the memory tests also required the subjects to indicate their confidence about the correctness of responses. To assist the subjects to indicate their confidence, a certainty scale was developed and was tested in two pre-tests.

The first pre-test used a scale with three anchors: absolutely uncertain (0%), neither uncertain nor certain (50%), and absolutely certain (100%) (Figure 22). A discussion with the subjects indicated that the middle anchor was interpreted differently by different subjects. In the second pre-test, the middle anchor was removed from the scale, keeping only the end anchors. This scale also produced some problems for the

**Figure 21**  
**Relative Price Recall Test**

a. Following are the names of the six items of canned soup that were presented to you in the booklet. Please do two things:

(1) Rank the items in terms of their prices per can (not price per ounce). That is, write "1" for the item you think had the lowest price per can, "2" for the next more expensive, and so on, and "6" for the item you think had the highest price per can of soup.

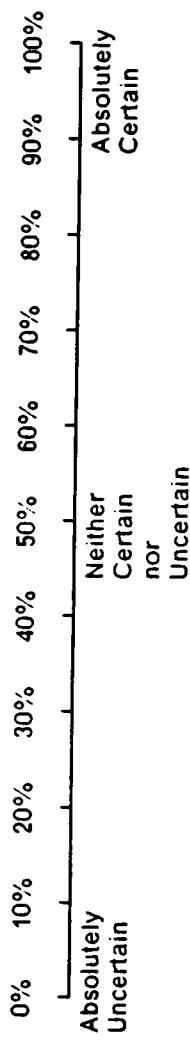
(2) Indicate the level of surely that each of your six ranking responses is correct by using the surety scale provided earlier.

Items	Expensiveness Ranks ("1" for The least expen- sive, "6" for the most expensive item)	Your level of surety that the response in the second column is correct
Curly Noodle with Chicken	<input type="text"/>	<input type="text"/> % Sure
Cream of Asparagus	<input type="text"/>	<input type="text"/> % Sure
Chicken Broth	<input type="text"/>	<input type="text"/> % Sure
Creamy Chicken Mushroom	<input type="text"/>	<input type="text"/> % Sure
Tomato Bisque	<input type="text"/>	<input type="text"/> % Sure
Chunky Chicken Vegetable	<input type="text"/>	<input type="text"/> % Sure

**Figure 22**

**Confidence Scale Used in First Pretest**

While responding to some of the questions, you may or may not be completely *certain* whether your responses are correct. In order to assess the *level of certainty*, the following scale is provided:



If you are absolutely certain that your response is correct, write 100% in the questionnaire in the appropriate box. If you are absolutely uncertain about the correctness of your response, write 0%. If your certainty level is somewhere in between these two extremes, write the number that best represents your level of certainty.

*Keep this page in front of you and use it whenever you have to indicate your level of certainty.*

*If you have any question about the certainty scale, let me know. Otherwise, wait for the next instruction.*

subjects' when their level of confidence was somewhere between 0% and 100%. The third pre-test introduced four additional anchors (but avoided the mid-point) corresponding to different levels of certainty. Also, the word 'certain' was replaced by 'sure' to make it more colloquial (Figure 23). Subjects in the third pre-test did not seem to have difficulty with this scale; therefore, this scale for confidence was used in the actual experiment.

### **Individual Difference**

It was discussed earlier that random assignment of subjects to experimental conditions should serve to reduce systematic biases on account of individual differences. However, it was necessary to check if such differences exist across conditions despite the random assignment. The individual differences that may influence subjects' memory test performance may be due to their price consciousness or their demographic factors like income, household size, employment status, and age. To collect information on these factors, the subjects responded to two sets of questions after the memory tests. the first set was designed to assess subjects' price consciousness or their sensitivity toward grocery prices. The second set collected their demographic information.

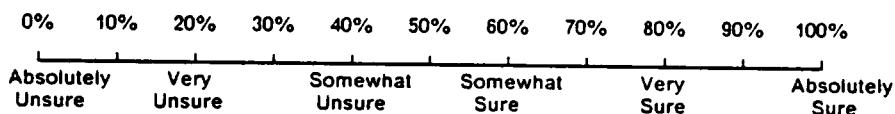
To assess how conscious the subjects are to grocery prices, a thirteen item questionnaire was developed (Figure 24) from the questionnaire used by Guiltinan and Monroe (1980). The coefficient alpha of 0.85 indicates an acceptable level of reliability of the scale items. No item

**Figure 23**

**Confidence Scale Used for the Actual Memory Tests**

For some of the next set of questions, you may believe that the task asked of you is somewhat difficult, or perhaps unnecessary. However, each task is important, so please do the best you can. The reasons for asking you these questions will be explained when you complete the questionnaire.

While responding to some of the questions that follow, you may or may not be completely **sure** whether your responses are correct. To assess how sure you are, the following scale is provided:



If you are absolutely sure that your response is correct, write 100% in the appropriate spaces in the questionnaire. If you are absolutely unsure about the correctness of your response, write 0%. If your certainty level is somewhere in between these two extremes, write the number that best represents your level of surety.

Keep this page in front of you and use it whenever you have to indicate how sure you are about your responses.

If you have any question about the surety scale, please let me know. Otherwise, please go on to the next page.

**Figure 24**  
**Assessment of Subjects' Price Consciousness**

The following questions relate to your own grocery shopping habits. Please evaluate each of the following statements and indicate the extent to which you agree with them by placing a cross (x) in the appropriate spaces below:

	Completely Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Completely Agree
1. Grocery shopping is a very important task.	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
2. I enjoy doing my regular grocery shopping.	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
3. I select a store because of the low prices it offers.	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
4. Price is a very important factor when deciding which grocery items to buy.	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
5. I always check prices of different items before making a selection.	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
6. I always try to keep myself within a budget when I am grocery shopping.	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
7. I usually select store-brands because of their low prices.	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

Completely Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Completely Agree
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8. Before going to the store, I check ads to find out what items are on sale.

---

9. A shopper can save a lot of money by shopping around for bargains.

---

10. The savings that you get by using coupons and by shopping for bargains is worth it.

---

11. I try to remember prices of different stores for deciding which store to visit for a given item.

---

12. I do not mind visiting several stores if I can get low prices.

---

13. I feel a sense of accomplishment if I can get a bargain price.

---

Please respond to the following questions as accurately as possible. These responses will be kept completely confidential and will be used only to interpret the research results.

1. Number of persons in your household: |\_\_\_\_\_|
2. Total number of earning members in your household: |\_\_\_\_\_|
3. Are you currently an earning member in your household? |\_\_\_\_\_|Yes |\_\_\_\_\_|No
4. Total income of your household. (Include incomes of all the members of your household):

Less than \$10,000	_____
Between \$10,000 and \$25,000	_____
Between \$25,000 and \$40,000	_____
Between \$40,000 and \$55,000	_____
Between \$55,000 and \$70,000	_____
Over \$70,000	_____

5. Approximate grocery bill of your household per month. \$ \_\_\_\_\_
6. Do you use an automobile for your grocery shopping? |\_\_\_\_\_|Yes |\_\_\_\_\_|No
7. Your Date of Birth \_\_\_\_\_
8. Are you currently married? |\_\_\_\_\_|Yes |\_\_\_\_\_|No

was needed to be deleted from the scale to improve the reliability of the measure (Table 11).

The mean scores of the price consciousness scale items were used to check if significant differences existed across conditions. Also, the price consciousness scores were used as a covariate along with the two independent factors to assess its impact on memory test performance. These results are reported in Chapter IV.

The demographic information collected from the subjects included their household size, employment status, income levels, marital status, employment status, monthly expenditure on grocery, and their age. This information was used to check for differences across experimental conditions as well as for an effect on memory test performance. These results are reported in Chapter IV.

### **Debriefing**

At the end of the experiment, the subjects were told about the true purpose of the research. It was explained why it was necessary to conceal the true purpose. The subjects were also given an opportunity to ask any question they had about the experiment. As a reward for participating in the research, each subject were given five dollars.

**Table 11**  
**Reliability Analysis of Price Consciousness Scale**

**A. Selected Statistics**

Coefficient Alpha: 0.8453  
 Mean Inter-item Correlation: 0.2964

**B. Results When Items are Deleted**

	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha If Item Deleted
Item1	38.13	90.07	.40	.32	.84
Item2	38.90	89.53	.30	.28	.85
Item3	38.86	85.86	.51	.38	.83
Item4	38.86	84.28	.59	.59	.83
Item5	38.57	84.52	.54	.54	.83
Item6	39.21	85.52	.45	.35	.84
Item7	39.67	86.31	.41	.41	.84
Item8	39.48	77.67	.64	.57	.82
Item9	39.07	89.95	.33	.36	.84
Item10	38.86	85.74	.56	.43	.83
Item11	39.64	81.65	.58	.55	.83
Item12	40.27	82.62	.64	.55	.83
Item13	38.63	85.18	.54	.38	.83

## VALIDITY ISSUES

The validity of a research can be assessed from its information content and the knowledge it generates in the process of examining postulated relationships (Judd and Kenny 1982) given the stage of knowledge development the research stream is in (McGrath and Brinberg 1983). Cook and Campbell (1979) have distinguished four types of research validity, each addressing a different aspect of the information content of a research. These four types are: internal validity, construct validity, internal validity, and statistical conclusion validity. Each of these validity issues are discussed next in the context of research methodology used in this research.

### Internal Validity

Internal validity of a research is the extent to which the observed treatment effect is causal (Judd and Kenny 1982). It was mentioned in the beginning of this chapter that the overriding goal of this research was to establish causal relationships among theoretical constructs. Thus, achieving internally valid research results was the primary concern of this study. To meet the requirements of internal validity, this research employed an experimental method in a laboratory setting allowing for maximum possible control over manipulations of the levels of the independent variables and minimizing the interference from non-theoretical variables. Random assignment of subjects to treatment conditions was used

to minimize the possibility that systematic biases influenced the research results. Similar efforts to remove biases on account of stimulus differences was taken by identical stimuli to subjects in each conditions.

Despite the controls offered in the methodology, there may still be some potential confounds giving rise to alternative explanations for the research results.

#### **Product-related Confound**

One of the major arguments of this research is that buyers' knowledge of price and their retrieval performance can be explained by the differences in cognitive factors rather than by the product-related characteristics. To test the validity of this assumption, it would be necessary to examine if indeed there are no systematic differences in buyers' price awareness due to product differences. Statistical tests were carried out to check if any variations in retrieval performance exists across different products. The results are reported in the next chapter.

#### **Subject-related Confound**

Even though the random assignment procedure was expected to rule out possibility of systematic variations on account of differences in subject's individual characteristics, it was necessary to check this assumption. The information on subjects' price consciousness and demographic factors was used to examine if differences on these individual

characteristics existed among subjects assigned to different treatment conditions and whether such differences had influenced the research results. Results of this analyses are discussed in the next chapter.

#### **Price-related Confound**

This research does not recognize the possibility of differences in buyers' memory test performance due to the difference in the actual magnitude of prices of different product categories. An analysis of covariance (with price as a covariate) was carried out to check if actual magnitude of prices was related to the retention test performance. The results are discussed in Chapter IV.

#### **Other Confounds**

It is recognized that there could be several other factors that could not be controlled for in the research. Among them are: selection time, elapsed time, and latency. Appropriate tests were carried out to check for the effects of these factors and the results are reported in the next chapter.

#### **Construct Validity**

Construct validity refers to the extent to which the independent and dependent variables in a study successfully represent the intended the-

oretical constructs (Cronbach and Meehl 1955). Therefore, the measure of a construct can be considered valid if such measure is consistent with the theory (nomological validity) and are stable across time, subjects, and other factors (reliability).

The two independent variables in this research are learning intention and choice task orientations. Consistent with the theory, these two constructs were induced on subjects by suitably manipulating the learning and task instructions. To ensure that proper inductions have taken place, strengths of the manipulations were assessed. Also, this research argues that subjects' memory test performances are determined by their intention to learn and choice task dimensions. If this research finds no variations due to product differences, price differences, and individual differences, some construct validity assertions can be made.

As far as the dependent variable, price awareness, is concerned, this research argued that a recall measure alone was not adequate. As a result, additional memory tests were administered. Moreover, this research also used subjects' confidence as a supporting measure of memory test accuracy to assess the consistency of subjects' responses on the dependent variables.

### External Validity

External validity refers to the extent to which the research results can be generalized beyond the circumstances under which the study was conducted (Cook and Campbell 1979). Given the early stage of theory de-

velopment in this research steam, this research effort admittedly does not concern itself with generating the results to other settings, products, and subjects. In fact, obtaining overall price awareness or knowledge measures is not the goal of the research. However, by collecting data on buyers' price consciousness and selected socio-economic data, it may be possible to make some inference (although not conclusive) about the robustness of the results.

In any case, a logical next step toward external validity would be to replicate the experiment in a store setting using other shoppers and assigning them to experimental conditions according to their overall shopping orientations.

#### Statistical Conclusion Validity

Statistical conclusion validity refers to the extent to which statistical tests are capable of detecting postulated relationships (Cook and Campbell 1979). Specifically, the validity of statistical assumptions and power of the statistical tests to detect the real effects are issues of statistical conclusion validity.

First, the experimental procedures used in this research allowed the researcher to manipulate the experimental conditions which made the independent variables orthogonal and therefore, made the parameter estimates stable.

Second, by minimizing the variations due to non-theoretical factors, the tests of hypotheses are stronger. In other words, by minimizing

random error and by including the interaction term in the model specifications, the tests of main effect are expected to be powerful.

Third, the large number of observations (sixty) per cell allows for applying the central limit theorem and therefore, normality. Thus, parametric statistical testing procedures are valid.

Fourth, by choosing a between-subjects design (on both factors), the research reduced the possibility of correlated error and heterogeneity of variance in different treatment conditions.

Finally, assuming no product-related differences, the sample size (of 60 observations per cell) was expected to make the tests powerful to detect the effect of the manipulations.

#### SUMMARY

This chapter presented the research design and methodology employed in this research. The first section proposed two measures, accuracy and confidence, for evaluating recall and recognition test performance and translated the theoretical propositions into sixteen operational hypotheses. Accuracy was measured by proportion of correct responses in recall, recognition and relative recall tests. When evaluating only the recall test, percentage absolute recall error and correlation between actual and recalled price were also used as additional measure of accuracy to check if recall responses are consistent. Confidence about the accuracy in memory tests was measured by subjects' own judgments about the correctness of their responses using a probability rating scale.

Given the nature of the theoretical constructs and given that establishment of internally valid results was the overriding goal, this research used a laboratory experiment to test the research hypotheses. The two factors, learning intention and choice task orientations, were fully crossed with two levels of learning intentions and three levels of choice task orientations, thus producing a  $2 \times 3$  full-factorial design. Ninety women shoppers were selected conveniently from different women's groups in Blacksburg. The subjects were randomly assigned to each of the six cells in a between-subjects (on both factors) design.

The stimulus consisted of product and price information of six packaged food product categories with six items in each category. The information was presented in a matrix format and the sequence of presentation was altered at random. Using the information and based upon some specific choice criteria, subjects made six selections, one from each product category. After the selections, the stimulus material was withdrawn and the subjects were given recall, recognition, and relative recall tests involving prices of the items selected. Subjects also responded to a few additional questions which were used for manipulation checks and assessment of individual factors that might affect their memory test performances. The complete sets of the experimental procedures are furnished in Appendix A through Appendix F (six conditions) and the complete set of questionnaire is shown in Appendix G.

The research methodology conforms well with the desired internal validity requirements by providing the researcher necessary controls. Reasonable construct validity assertions can also be made from the re-

search results. However, given the contrived nature of the shopping experience that the subjects went through, generalization of the research results to actual shopping setting may not be possible at this stage of the research.

## CHAPTER IV

### ANALYSIS AND RESULTS

#### OVERVIEW

The purpose of this chapter is to analyze the data collected in the experiment and report the results. With this objective, the chapter is divided into seven sections. The first section briefly describes the data collection procedure with specific focus on administration of the experiment and case deletions. The second section evaluates the strengths of the experimental manipulation and assesses the consistency of subjects' responses. The third section presents the statistical model under test. When the accuracy of memory tests was operationalized with the help of categorical responses (correct or incorrect), maximum likelihood estimation procedures were used. However, for continuous response variables (e.g., percentage recall error and confidence ratings), ordinary least square estimations of parameters was done in a univariate ANOVA framework. The fourth section analyzes the summary results and examines if the necessary statistical assumptions are met. The fifth section reports the results of the statistical testing of the hypotheses. The sixth section examines the possibility of alternative explanations or possible confounds. These product-related differences, price-related differences, differences due to encoding time, elapsed time, and latency, and finally,

the differences due to individual characteristics. The last section presents a summary of the chapter.

### **DATA COLLECTION**

As described in the previous chapter, the data for this research were collected in a laboratory experiment. Instead of conducting the experiment with all ninety subjects at the same time, fifteen sessions were arranged depending upon the convenience of the subjects and the researcher. In each session, the six subjects were assigned randomly to one of the six experimental conditions. This procedure ensured that subjects in each conditions faced the same environmental conditions, like locations where the experiment were conducted, time of day (or night), and level of noise and distractions. Also, by having the experiment conducted in small groups of six offered the researcher greater control in terms of checking whether subjects referred back to their earlier responses in the memory tests, and, if necessary, explaining the experimental tasks, memory tests, and questionnaire items.

#### **Case Deletion**

Initially, ninety subjects took part in the experiment. However, responses of two subjects had to be deleted. In one case, the subject

assigned to intentional learning condition, had written down the prices of selected items on the "selection card." In another case, the subject found the memory test too intense and decided to quit. To make up for the deletion of these two cases, two additional subjects were assigned to the same experimental conditions.

After each experimental session the responses were checked for completeness in all respects. No further cases had to be deleted due to non-response or ambiguous responses in the memory tests. However, four subjects decided not to disclose their income, one subject did not disclose her age, and three subjects could not remember their monthly grocery expense.

Thus, for each experimental condition, fifteen completed responses were coded and analyzed.

#### MANIPULATION CHECKS

Before testing individual hypotheses, it was necessary to assess the strengths of independent variable manipulations and consistency of the dependent measures.

### **Choice Task Orientations**

As discussed in the previous chapter, the choice task orientations were induced by requiring the subjects to use different criteria to make their selections. To assess if the subjects had used the specified criteria and had paid attention to the necessary information during their selection process, the subjects responded to the set of questions presented before in Figure 16. The mean scores of subjects' responses to these questions are summarized and presented in Table 12.

The subjects in the non-price task group were required to use nutritional value and calorie information to make their selections. As a result, their attention was to be focused on these two pieces of information, and as a result, they were distracted from other information. The high mean scores, of usage of and attention paid to nutritional value and calorie information (Table 12) indicate successful induction of the non-price based task orientation. Also, the low scores on usage of prices for this task group confirmed the strength of manipulation.

Similarly, subjects in the mixed choice group used nutritional value and price and their attention was focused on these two pieces of information. In price-based choice task, subjects extensively used prices and net weights of different and paid attention to these two bits of information. The price-based group also used the number of servings to a considerable extent perhaps because of the ease of calculating price per serving rather than price per weight.

**Table 12**  
**Manipulation Check for Choice Task Orientation**

**A. Mean Scores of Information Used:**

<u>Information Used</u>	<u>Non-Price Choice</u>	<u>Mixed Choice</u>	<u>Price-based Choice</u>
1. Nutritional Values	4.83 (0.46)*	4.77 (0.82)	1.55 (1.06)
2. Calorie Content	4.77 (0.50)	1.26 (0.74)	1.27 (0.59)
3. Number of Servings	2.93 (1.55)	3.37 (1.54)	4.10 (1.27)
4. Prices	1.73 (1.14)	4.77 (0.57)	4.87 (0.35)
5. Net Weights	2.50 (1.36)	2.50 (1.31)	4.30 (1.15)
6. Manufacturers' or Distributors' Name	1.97 (1.00)	2.17 (1.02)	2.59 (1.26)
7. Names of the items	2.26 (1.44)	2.55 (1.35)	2.69 (1.36)

Scale Used: Never used the information = 1  
 Always used the information = 5

\*Figures in parentheses indicate standard deviations

**Table 12 Continued**

**B. Attention Paid to Information Provided:**

<u>Information Used</u>	<u>Non-Price Choice(N=30)</u>	<u>Mixed Choice(N=30)</u>	<u>Price-based Choice(N=30)</u>
1. Nutritional Values	4.86 (0.43)*	4.80 (0.55)	1.48 (0.91)
2. Calorie Content	4.80 (0.48)	1.33 (0.76)	1.21 (0.49)
3. Number of Servings	3.10 (1.49)	3.30 (1.49)	4.10 (1.21)
4. Prices	1.90 (1.18)	4.87 (0.43)	4.83 (0.46)
5. Net Weights	2.47 (1.33)	2.67 (1.18)	4.27 (1.11)
6. Manufacturers' or Distributors' Name	1.97 (0.93)	2.30 (1.29)	2.52 (1.15)
7. Names of the items	2.20 (1.21)	2.48 (1.15)	2.66 (1.29)

Scale Used: Paid no attention = 1  
Paid very close attention = 5

\*Figures in parentheses indicate standard deviations

Table 12 also indicates that the mean scores of usage and attention paid to item or manufacturers name were generally low and were reasonably less uniform across the three task groups. This finding alleviates the earlier mentioned concern that presence of item or brand names may weaken the choice task manipulation. Clearly, subjects did not base their choice decisions simply on the item or brand names and did try to use the choice criteria specified.

As an additional check for the choice task manipulations, the items were ranked from 'best' (1) to "worst" (6) depending upon the choice criteria specified in each choice task (Table 13). For example, in non-price choice tasks, the nutritional values per unit of calorie content were used to rank the items. In the mixed task, the ratio of nutritional value and price was used for ranking. Similarly, in the priced-based choice task, the items were ranked in terms of their unit prices. These ranks were compared against the items actually selected by the subjects (Table 14). Overall, fifty percent of the times, subjects made the "best" selections, given the criteria specified. Even when the 'best' item was not chosen, the mean deviation (actual rank of the item, given the choice criteria minus 1) was only 0.94. This implies that on the average, subjects were less than one item away from the 'best' choice.

Subjects in the price-based choice group were most successful in making the 'best' selections perhaps because of the relative ease of calculating either the unit prices or price per servings of the different items. Apparently, the tasks involved in non-price and mixed choices were relatively difficult either because of large numbers associated with nu-

**Table 13**

**Item Ranks in Terms of Choice Criteria Specified**

Rank = 1 for 'best' choice, given the criteria for selection  
Rank = 6 for 'worst' choice, given the criteria selection

<u>Choice Tasks</u>	<u>Non-Price</u>	<u>Mixed</u>	<u>Price</u>
<b>1. Frozen Orange Juice</b>			
Citrus Hill	1	1	6
Florida Gold	2	6	5
Sun Gold	5	5	2
Seneca	4	4	3
Minute Maid	3	3	4
Kroger	6	2	1
<b>2. Canned Soup</b>			
Curley Noodle with Chicken	4	4	2
Cream of Asparagus	6	5	3
Chicken Broth	5	6	1
Creamy Chicken Mushroom	1	2	4
Tomato Bisque	3	1	5
Chunky Chicken Vegetable	2	3	6
<b>3. Cold Breakfast Cereal</b>			
Raisin Bran	1	4	2
Corn Flakes	2	3	1
All-bran Fruit & Almonds	6	2	6
Raisin Square	4	6	4
Just Right	5	1	5
Frosted Mini-Wheats	3	3	3
<b>4. Pasta Dinner</b>			
Deluxe Macaroni & Cheese	6	1	5
Egg Noodle with Chicken	1	4	6
Creamy Pasta	2	2	4
Velveeta Shells & Cheese	5	5	3
Cheese Supreme	3	3	2
Macaroni & Cheese	4	6	1

**Table 14**  
**Comparison Between 'Best Choice' and Actual Choice**

	<u>Non-Price Choice</u>	<u>Mixed Choice</u>	<u>Price-Based Choice</u>	<u>Total</u>
<b>Total Number of Observations (N)</b>	<b>120</b>	<b>120</b>	<b>120</b>	<b>360</b>
<b>Number of Times 'Best' Item was Chosen</b>	<b>61</b>	<b>49</b>	<b>69</b>	<b>179</b>
<b>Percentage of Times 'Best' Item was Chosen</b>	<b>51%</b>	<b>41%</b>	<b>58%</b>	<b>50%</b>
<b>Mean Deviation from the 'Best' Item (0 = When 'Best' Item was chosen; 5 = When 'Worst' Item was chosen)</b>	<b>1.15</b>	<b>1.00</b>	<b>0.68</b>	<b>0.94</b>

tritional and calorie information (for non-price choices) or because the price and nutritional information were not placed in adjacent columns (for mixed choices).

### **Learning Intention**

As discussed in the previous chapter, intentional learning was induced by alerting the subjects about a possible memory test involving prices of items selected. The subjects in the incidental learning treatment did not receive such instructions. To assess the strength of the manipulation, it was necessary to check: (1) if the subjects had anticipated the forthcoming memory tests, and (2) if they tried to memorize the prices of selected items. This was done by requesting the subjects to respond to four statements on the 5-point 'agree-disagree' scale that was presented earlier in Figure 17. The third statement in Figure 17 was included to assess if subjects in the intentional learning condition were selective in focusing their attention only on the prices of the selected item, ignoring other prices. However, an analysis of the responses to this item indicated that while subjects in the non-price task group completely ignored other prices, the subjects in the other two task groups did not do so because of the nature of their choice tasks. Because of this finding, the responses to this item were excluded from further analysis.

The mean scores and the standard deviations of the other three scale item responses for the incidental and intentional groups were computed and compared (Table 15). Clearly, the subjects in the intentional learning group had significantly greater preparedness for the subsequent memory tests than the incidental group and had tried to memorize the prices for later retrieval.

### **Consistency of Dependent Measures**

The dependent variables in this research were subjects' performances in the different memory tests. Ideally, the consistency of subjects' responses could be assessed by repeated administration of the same memory tests. Unfortunately, this could not be done because of the boredom or fatigue factors. However, as an attempt to assess the response consistency, the following responses were correlated: (1) recall scores (correct or incorrect), (2) percentage absolute recall error, (3) recall confidence, (4) recognition scores (correct or incorrect), and (5) recognition confidence. The Pearson correlation coefficients and their respective significance levels are reported in Table 16. The high correlation among the measures indicate consistency of the measures of underlying construct, price awareness.

In summary, this section analyzed the strength of the choice task and learning intention manipulations. Subjects' responses to the manipulation check items indicate satisfactory inductions of these two inde-

**Table 15**  
**Intentional Learning Manipulation Check**

	<u>Mean</u>	<u>S.D.</u>
Intentional Learning (N = 45)	4.14	1.02
Incidental Learning (N = 45)	2.06	1.09

Difference in mean scores significant at  $p = 0.0001$  ( $F = 85.61$ ;  $df = 1,84$ )

**Table 16**  
**Consistency of Dependent Variables**

	RCSCOR	RCERROR	RCCONF	RGSCOR	RGCONF
RCSCOR	1.00	-0.45 (0.0001)*	0.42 (0.0001)	0.64 (0.0001)	0.40 (0.0001)
RCERROR		1.00	-0.33 (0.0001)	-0.30 (0.0001)	-0.37 (0.0001)
RCCONF			1.00	0.32 (0.0001)	0.65 (0.0001)
RGSCOR				1.00	0.32 (0.0001)
RGCONF					1.00

RCSCOR = Recall Score (Correct = 1; Incorrect = 0)

RCERROR = Percentage Absolute Recall Error

$$\frac{|\text{Recalled Price} - \text{Actual Price}|}{\text{Actual Price}} \times 100$$

RCCONF = Recall Confidence (0% to 100%)

RGSCOR = Recognition Score (Correct = 1; Incorrect = 0)

RGCONF = Recognition Confidence (0% to 100%)

\*Figures in parentheses indicate the significance levels.

pendent variables. Subjects responses to memory tests and their confidence judgments were also found to be significantly correlated suggesting consistency of the dependent measures. Having analyzed these two aspects of the experimental procedure, it is now possible to discuss the statistical models and parameter estimation procedures used for testing specific hypotheses.

### STATISTICAL MODEL AND PARAMETER ESTIMATIONS

As discussed in Chapter III, the hypotheses to be tested involved assessing the effects of choice task and learning-related factors on subjects' memory test performances. The operational measures used to evaluate different memory tests were:

#### A. Exact Price Recall

- (1) Number (or proportion) of correct recall responses
- (2) Percentage absolute recall error
- (3) Correlation between actual price and recalled price
- (4) Confidence that the recalled price is correct

#### B. Price Recognition

- (1) Number (or proportion) of correct recognition responses
- (2) Confidence that the recognized price is correct

#### C. Relative Price Recall

- (1) Number (or proportion) of correct ranks
- (2) Correlation between actual rank and recalled rank

(3) Confidence that the recalled rank is correct

It may be apparent that when the number (or proportion) of correct responses is used as an operational measure, then the dependent variable is dichotomous (correct or incorrect). However, for other measures of memory test performance, the dependent variables can be considered continuous.

### Categorical Response Variables

Three distinctive features of general linear models involving dichotomous response variables are: (1) the random error terms are distributed binomial, (2) the error terms are heteroskedastic, and (3) the predicted response is the estimated probability of an event occurring, given the levels of independent variables. Thus, the predicted response must lie between 0 and 1 (Pindyck and Rubinfeld 1981). Because of the third feature, the dependent measure must be transformed into a function that guarantees the 0-1 bounds of the predicted responses. This is done by expressing the dependent variable as a logit function which is given by

$$\text{logit}_i = \log(P_i/1 - P_i) = \log(\text{odds}). \quad (1)$$

Thus,  $\text{logit}_{ijk}$  is the expected value of the choice probabilities for the observed cell  $i, j$ . The general linear model therefore can be written as:

$$\text{logit}_{ijk} = \mu + \alpha_i + \beta_j + (\alpha\beta)_{ij} + \epsilon_{ijk} \quad (2)$$

where,

- $\mu$  is the grand mean of proportion correct in the recall or recognition tests
- $\alpha_i$  is the choice task orientation main effect on proportion correct in recall or recognition tests
- $\beta_j$  is the learning intention main effect on proportion correct in recall or recognition tests.
- $(\alpha\beta)_{ij}$  is the interaction effect between ith level of choice task orientation and jth level of learning intention on proportion correct in recall and recognition tests.
- $\epsilon_{ijk}$  is the random error for kth observation in recall or recognition test accuracies.

The ordinary-least-square estimates of equation (2) although unbiased do not possess minimum sampling variance (Aldrich and Nelson 1984). As a result, the hypothesis testing of the model requires maximum-likelihood estimation of the parameters. In the maximum-likelihood method, the parameters are estimated so as to maximize the value of the joint multinomial likelihood function of the responses. For large sample sizes, the estimates are asymptotically normal and efficient (Bishop, Fienberg, and Holland 1975). SAS, Version 5 (1985) offers CATMOD (Categorical Data Modelling) procedures which allow testing of hypotheses of loglinear models involving categorical dependent variables. The procedure matches the features of ANOVA and uses maximum likelihood estimations (for log-linear models). CATMOD computes generalized Wald (1943) statistics, which are approximately distributed as chi-square if the sample sizes are sufficiently large (Bishop, Fienberg, and Holland, 1975). This statistic was used when assessing the main and interaction effects of independent factors on recall, recognition, and relative recall accuracy.

## **Continuous Response Variables**

When testing hypotheses involving continuous dependent variables (e.g. percentage absolute recall error and confidence judgments), OLS estimation in an ANOVA framework was used. The general linear model is:

$$Y_{ijk} = \mu + \alpha_i + \beta_j + (\alpha\beta)_{ij} + \epsilon_{ijk} \quad (3)$$

where,

- $Y_{ijk}$  is percentage recall error or recall, recognition, and relative recall confidence of kth response in the ith level choice task orientation and jth level of learning intention.
- $\mu$  is the grand mean of percentage recall error or recall, recognition, and relative recall confidence.
- $\alpha_i$  is the choice task orientation main effect on percentage recall error or on recall, recognition, and relative recall confidence.
- $\beta_j$  is the learning intention main effect on percentage recall error or on recall, recognition, and relative recall confidence.
- $(\alpha\beta)_{ij}$  is the interaction effect between ith level of choice task orientation and jth level of learning intention on percentage recall error or on recall, recognition, and relative recall confidence.
- $\epsilon_{ijk}$  is the random error for kth observation in ith level of choice task orientation and jth level of learning intention.

With the statistical model clearly defined and estimation procedure stated, it is now possible to analyze the data collected in the experiment.

## **EVALUATION OF SUMMARY RESULTS**

Before testing the hypotheses, the summary results of the memory test performance across choice tasks and learning conditions were computed and analyzed.

### **Marginal Means of Test Results Across Choice Tasks**

The summary results of the dependent measures across the three levels of choice task conditions are presented in Table 17. It is clear that with greater usage of price-related information, subject's response accuracies in both recall and recognition test improved systematically. They also exhibited greater confidence about the accuracy as the choice task became more oriented toward price.

However, the performance in the relative recall test deteriorated with greater use of price-related information in choice tasks. This occurrence was counter-intuitive because one would expect that price-oriented choice tasks would involve ranking of items in terms of their expensiveness. What really happened was that despite asking the subjects to rank in terms of item prices, and not on the basis of unit prices, many subjects in the price-based choice group provided the rankings on the basis of unit prices. This implies that when buyers evaluate alternative

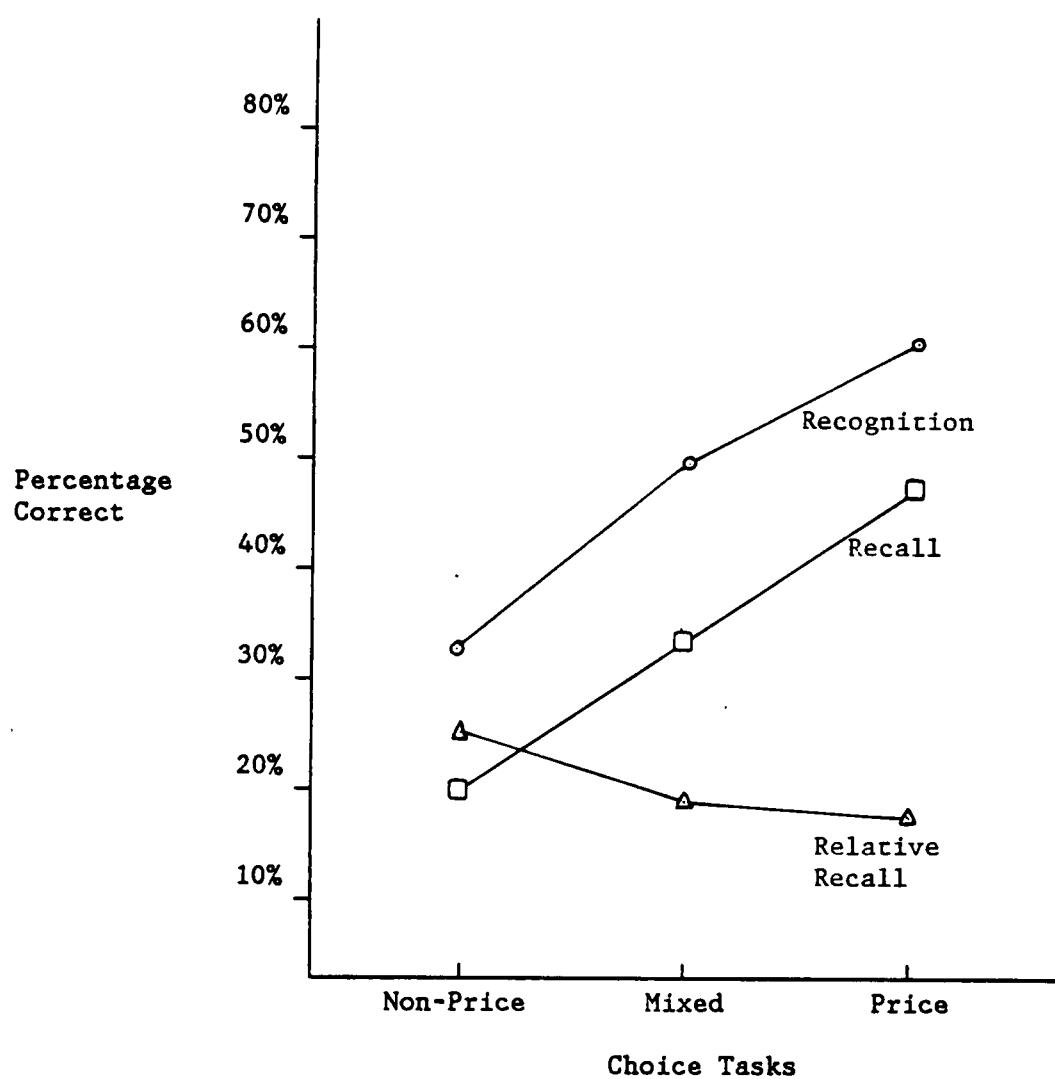
Table 17

**Summary Results of Memory Tests Across Choice Task Conditions**

Memory Tests	Non-Price Choice		Mixed Choice		Price-based Choice	
	Means	S.D.	Means	S.D.	Means	S.D.
1. Recall (N = 120)						
a. Number (or percent) Correct Recall	24 (20%)		40 (33%)		58 (48%)	
b. Percentage Absolute Recall Error (%)	29.52	39.35	16.50	23.15	10.43	20.41
c. Correlation (Actual Price, Recalled Price)	0.59		0.79		0.90	
d. Confidence about Recall Accuracy (%)	42.29	32.71	47.75	27.12	59.63	26.38
2. Recognition (N = 120)						
a. Number (or percent) Correct Recognition	39 (32.5%)		60 (50%)		74 (62%)	
b. Confidence about Recognition Accuracy (%)	55.58	30.65	60.75	24.71	78.63	20.21
3. Relative Recall (N = 120)						
a. Number (or percent) Correct Rankings	30 (25%)		23 (19%)		22 (18%)	
b. Correlation (Actual Rank, Recalled Rank)	0.26		0.22		0.11	
c. Confidence About Ranking Accuracy (%)	43.83	29.76	46.75	27.21	70.03	29.59

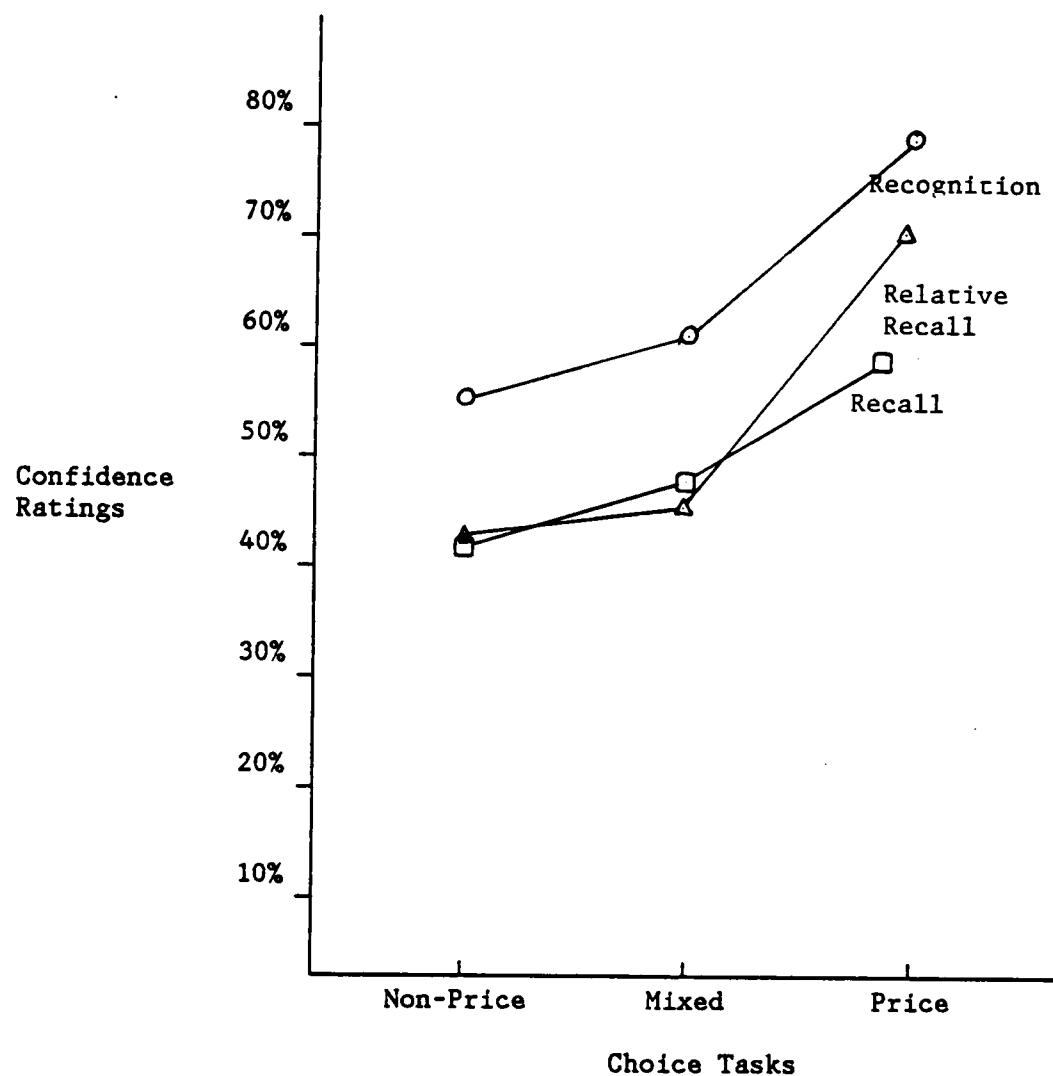
**Figure 25**

**Percentage of Correct Responses Across Choice Tasks**



**Figure 26**

**Confidence Ratings Across Choice Tasks**



items on the basis of their unit prices, although they can remember the item prices of the items they select, the ordering of the item expensiveness is done on the basis of unit prices. This interpretation may be further supported by the high confidence subjects exhibited about the correctness of their ranking responses.

The marginal means of different memory test results across choice tasks are depicted in Figures 25 and 26.

#### **Marginal Means of Test Results Across Learning Conditions**

The summary memory test results for the incidental and intentional learning groups are given in Table 18. It is evident that the subjects in the intentional groups performed considerably better than those in the incidental groups in both recall and recognition tests. Subjects confidence about response accuracies was also substantially greater for the intentional groups than for the incidental groups.

In the relative recall test, the improvement in response accuracy as well as confidence ratings of the intentional group was only marginal. This may imply that when the subjects were alerted about the impending memory tests, their attention was focused only on the prices of items selected and therefore, they may not have considered the relative rank of the items in terms of their prices.

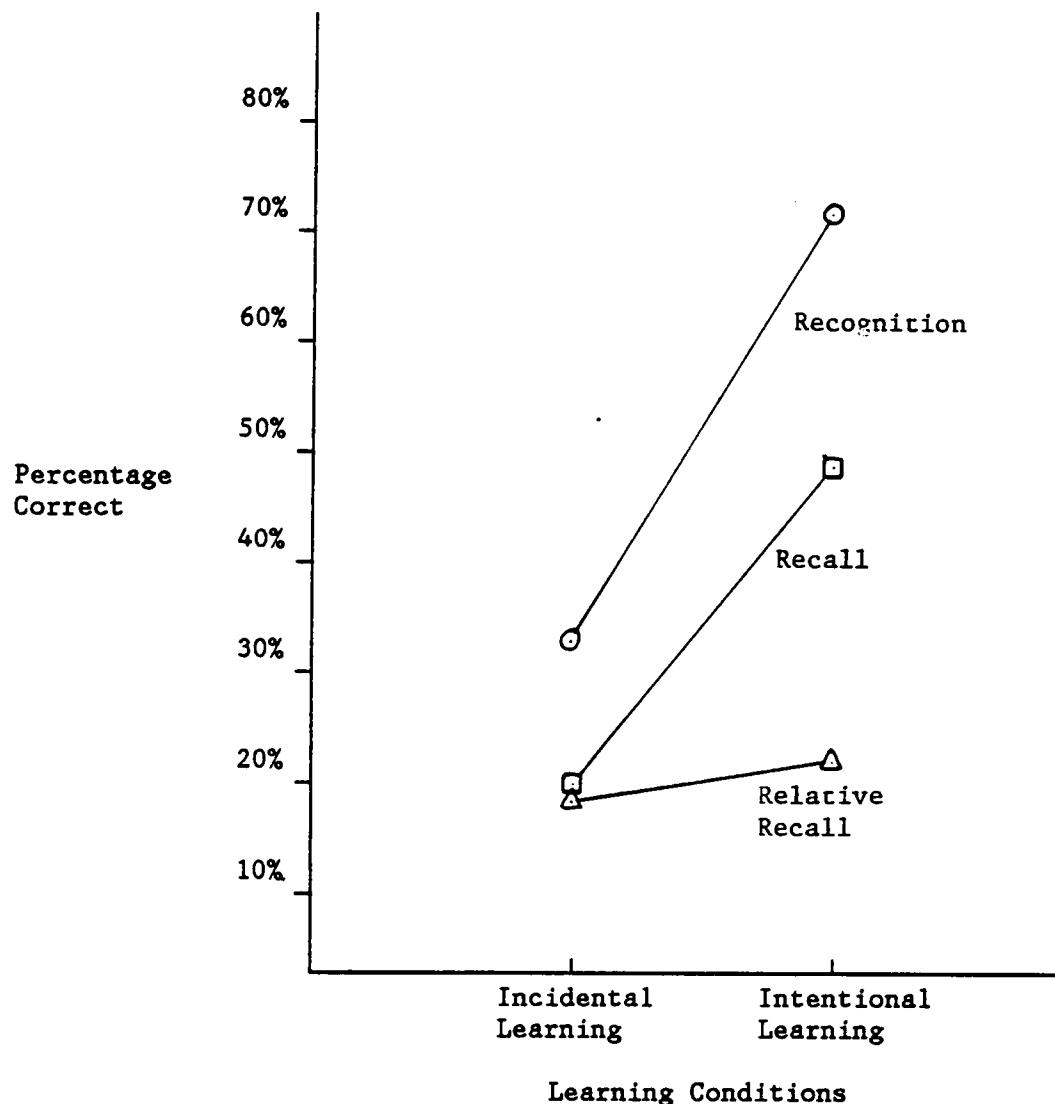
The summary results of different memory tests across the learning conditions are depicted in Figures 27 and 28.

Table 18

## Summary Results of Memory Tests Across Learning Intention Conditions

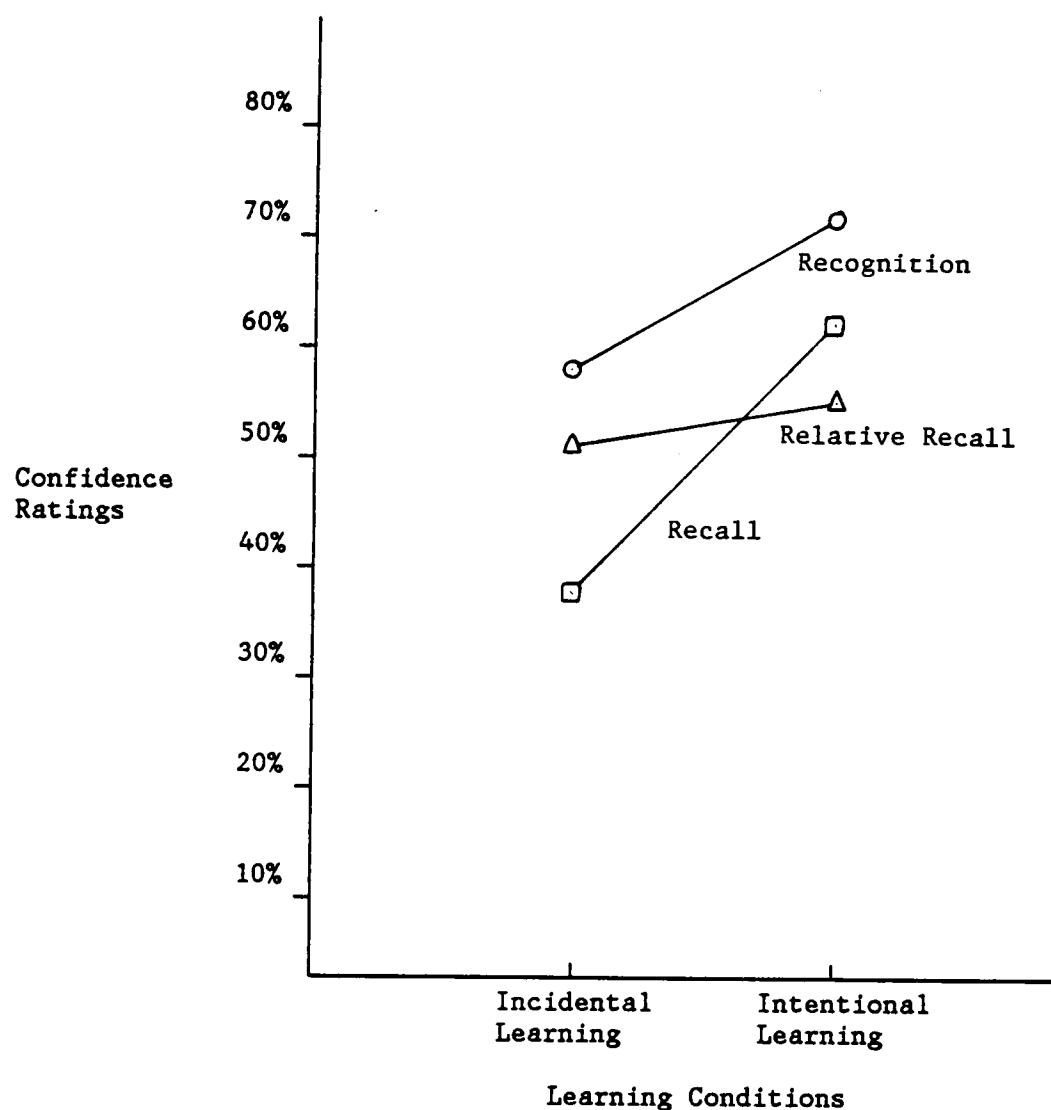
Memory Tests	Incidental Learning		Intentional Learning	
	Means	S.D.	Means	S.D.
1. Recall (N = 180)				
a. Number (or percent) Correct Recall	36 (20%)		86 (48%)	
b. Percentage Absolute Recall Error (%)	22.56		15.07	28.09
c. Correlation (Actual Price, Recalled Price)	0.69		0.80	
d. Confidence About Recall Accuracy (%)	37.92		61.86	26.50
2. Recognition (N = 180)				
a. Number (or percent) Correct Recognition	58 (32%)		115 (72%)	
b. Confidence about Recognition Accuracy (%)	58.17		71.81	25.47
3. Relative Recall (N = 180)				
a. Number (or percent) Correct Rankings	35 (19%)		40 (22%)	
b. Correlation (Actual Rank, Recalled Rank)	0.28		0.50	
c. Confidence About Ranking Accuracy (%)	50.46		56.61	30.73

**Figure 27**  
**Percentage of Correct Response Across Learning Conditions**



**Figure 28**

**Confidence Ratings Across Learning Conditions**



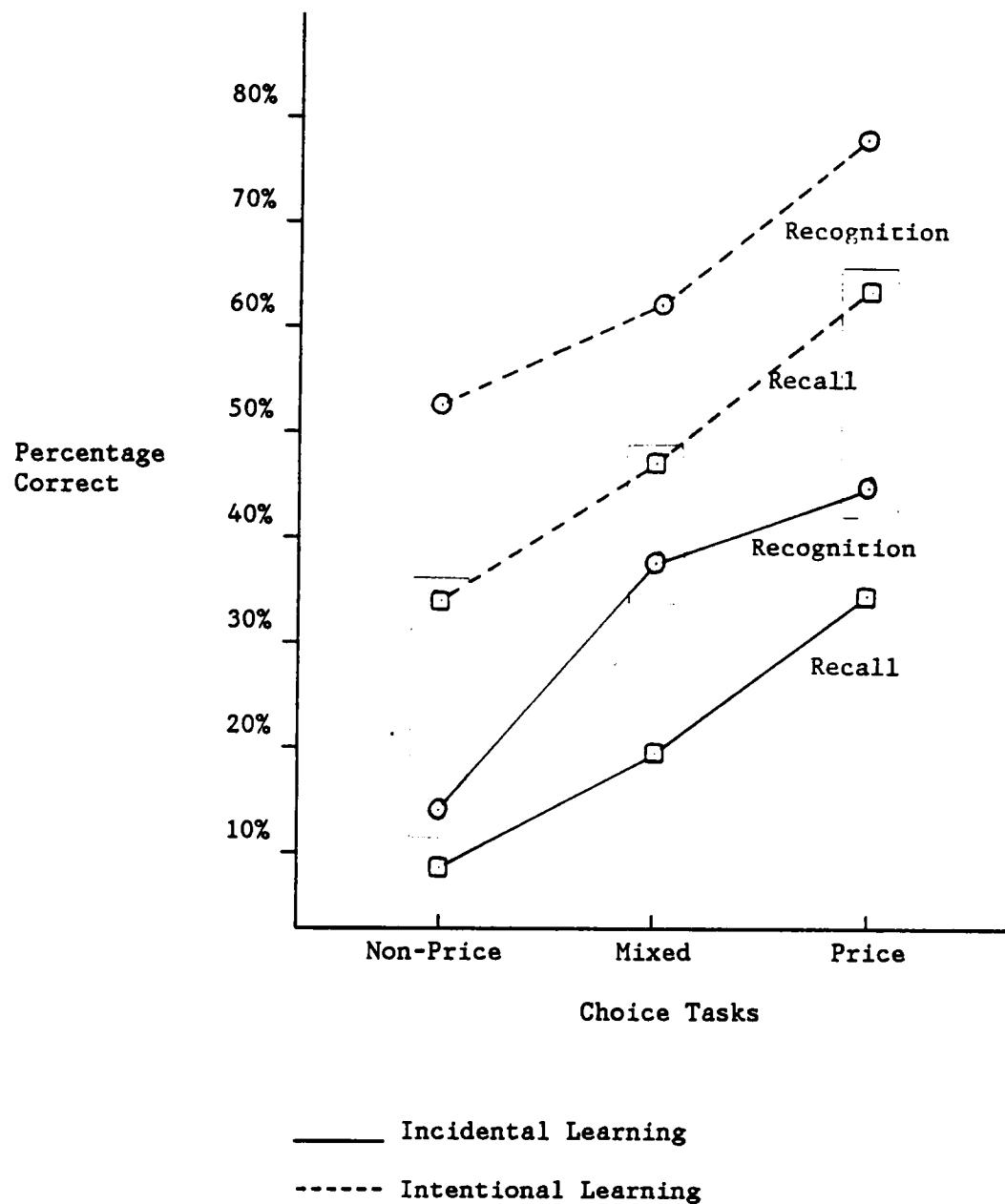
### **Cell Means of Test Results Across Learning and Task Conditions**

A summary of memory test results and confidence ratings for each of the six experimental conditions is given in Table 19. The graphical representations of the recall and recognition test scores are depicted in Figure 29 and 30. Some general observations can be made about these results. First, with greater use of price-related factors in the choice tasks both recall and recognition performance improves for both incidental and intentional groups. However the improvement in recognition test performance for the incidental learning group seems to level off. This may be due to the fact that subjects in both mixed choice and price-based choice used price as one of their criteria. Thus, the learning that took place incidental to the price-based choice may not have been significantly greater. Finally, when subjects knew that prices will have to be remembered, the price-based choice tasks reinforced their learning which resulted in considerable improvement in both recall and recognition performance. Finally, Figures 29 and 30 point out some situations when recall performance may indeed be better than recognition performance. When subjects knew that they had to remember prices for later use, their recall accuracy was consistently better than the recognition accuracy of the subjects who did not. This is true regardless of the nature of choice task (Figure 29). Also, the recall accuracies for subjects performing choice tasks involving prices were greater than the

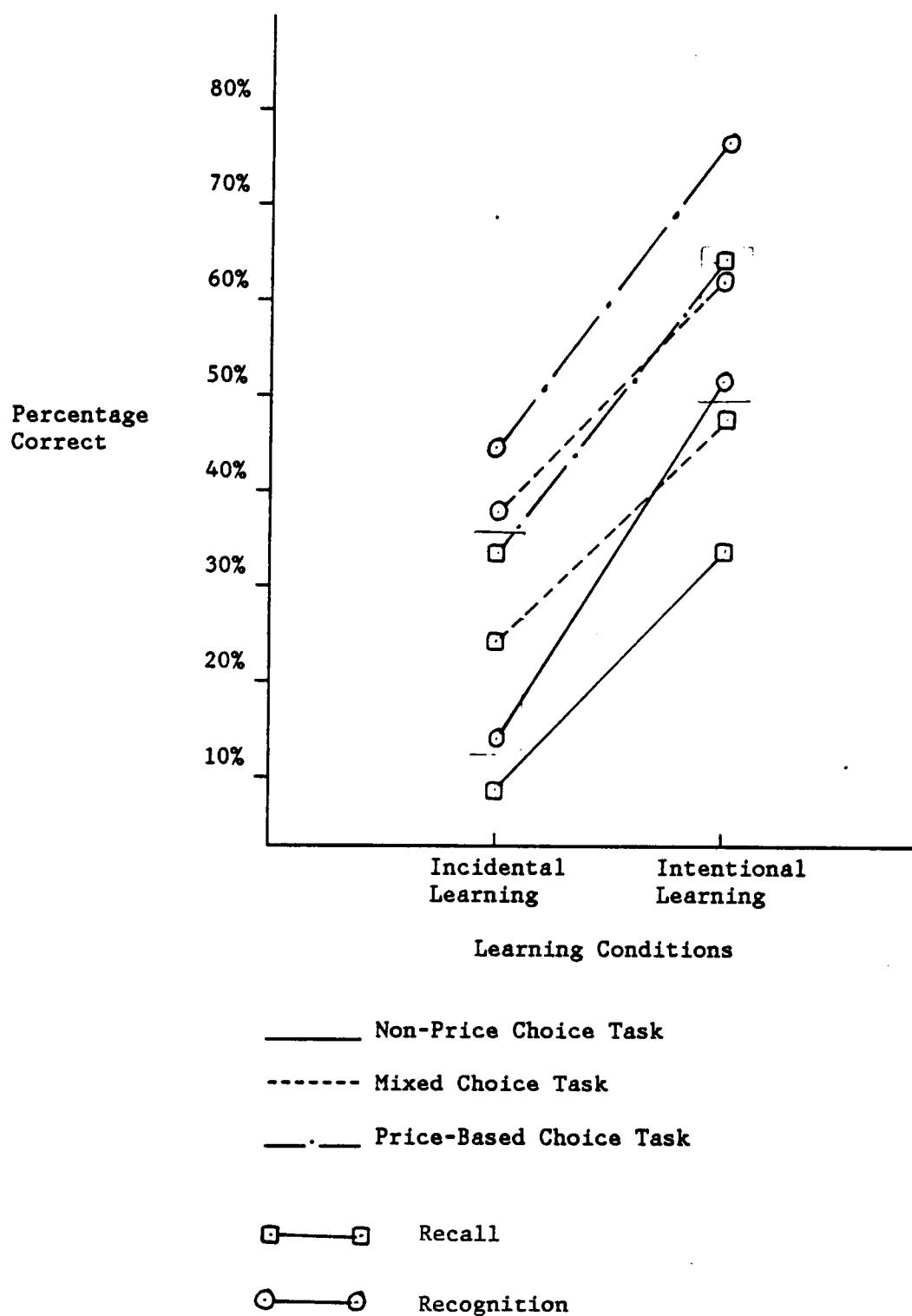
**Table 19**  
**Cell Means of Memory Test Results Across Conditions**

		<u>Incidental Learning</u>	<u>Intentional Learning</u>
<b>1. Non-Price Choice</b>			
A. <u>Recall</u> (N=60)			
a. Number (Percent) Correct	4 (7%)	20 (33%)	
b. Confidence	26.67	57.92	
B. <u>Recognition</u> (N=60)			
a. Number (Percent) Correct	8 (13%)	31 (52%)	
b. Confidence	45.25	65.92	
C. <u>Relative Recall</u> (N=60)			
a. Number (Percent) Correct	14 (23%)	16 (27%)	
b. Confidence	39.17	48.50	
<b>2. Mixed Choice</b>			
A. <u>Recall</u> (N=60)			
a. Number (Percent) Correct	12 (20%)	28 (47%)	
b. Confidence	37.33	58.17	
B. <u>Recognition</u> (N=60)			
a. Number (Percent) Correct	23 (38%)	37 (62%)	
b. Confidence	52.67	68.83,	
C. <u>Relative Recall</u> (N=60)			
a. Number (Percent) Correct	12 (20%)	11 (18%)	
b. Confidence	42.83	50.67	
<b>3. Price-Based Choice</b>			
A. <u>Recall</u> (N=60)			
a. Number (Percent) Correct	20 (33%)	38 (63%)	
b. Confidence	49.79	69.50	
B. <u>Recognition</u> (N=60)			
a. Number (Percent) Correct	27 (45%)	47 (78%)	
b. Confidence	76.58	80.67	
C. <u>Relative Recall</u> (N=60)			
a. Number (Percent) Correct	9 (15%)	13 (22%)	
b. Confidence	69.38	70.67	

**Figure 29**  
**Percent Correct in Recall and Recognition Across Choice Tasks**



**Figure 30**  
**Percentage Correct in Recall and Recognition Across Learning Conditions**



recognition accuracies for subjects making selections based on non-price criteria. These last two findings imply that the superiority of recognition test performance over recall test can only be claimed when both the task and learning dimensions of subjects are identical.

Having completed the general discussions of the summary results, it is now possible to carry out the statistical procedures for testing individual hypotheses.

#### HYPOTHESIS TESTING

This section will first examine the main- and interaction effect of the two independent factors on recall and recognition accuracies and the corresponding confidence judgments.

#### Recall Accuracy (H1 and H5)

It was mentioned earlier that when the effects of learning intention and choice task orientations on recall accuracy are evaluated, three accuracy measures are used. They are: (1) Number (or proportion) correct, (2) Percentage absolute recall error, and (3) correlation between recalled and actual price. However, since no statistical method to compare correlation coefficients across conditions is available, the first two measures were used to carry out the analyses of variance.

### **Number (or Proportion) of Correct Recall**

Since the dependent measures are dichotomous, it was necessary to check for independence of the two factors in the contingency table (Table 20) before testing the specific hypotheses. The chi-square test failed to reject the null hypothesis of independence. Thus, further analysis was carried out to test the log-linear model using maximum likelihood procedures. The log-linear model does not make a priori distinctions between dependent and independent variables and this allows for simultaneous examination of all pairwise relationships between categorical variables (Fienberg 1980). The summary ANOVA table for the log-linear model is presented in Table 21. The results are in support of H1 and H5. The null hypothesis of no interaction could not be rejected at 0.11 level.

### **Percentage Absolute Recall Error**

Since the number (or proportion) of correct recall does not take into account the closeness of subject's responses to the actual price, another ANOVA was carried out with percentage Absolute Recall Error as a dependent measure. The results (Table 22) provide support of H1 and H5 indicating significant main effects for learning intention ( $p = 0.0138$ ) and choice task orientations ( $p = 0.0001$ ). Again, no interaction between the two

**Table 20**  
**Test For Independence Between Experimental Factors**

**A. Contingency Table for Correct Recall**

Choice Tasks	Learning		Total
	Incidental	Intentional	
Non-Price	4	20	24
Mixed	12	28	40
Price	20	38	58
Total	36	86	122

<b>B. <u>Test Statistics</u></b>	<b>DF</b>	<b>Value</b>	<b>P-Value</b>
Chi-Square	2	2.597	0.273
Likelihood Ratio	2	2.798	0.247

**Table 21**

**Analysis of Variance with Proportion Correct as a  
Dependent Measure of Recall Accuracy**

Log-Linear Model (Maximum Likelihood Estimates)

<b>Source</b>	<b>DF</b>	<b>Chi-Square</b>	<b>P-Value</b>
Intercept	1	28.41	0.0001
Task	2	34.61	0.0001
Learning	1	21.50	0.0001
Task * Learning	2	4.40	0.1102

**Table 22**

**Analysis of Variance with Percentage Absolute Recall  
Error as a Dependent Measure of Recall Accuracy**

**Percentage Absolute Recall Error =  $\frac{\text{Abs}(\text{Recalled Price} - \text{Actual Price})}{\text{Actual Price}} \times 100$**

<b><u>Source</u></b>	<b><u>DF</u></b>	<b><u>ANOVA SS</u></b>	<b>F</b>	<b>P-Value</b>
Task	2	22831	13.83	0.0001
Learning	1	5051	6.12	0.0138
Task * Learning	2	381	0.23	0.7941
Error	354	292144		

**Model R-Square = 0.09**

factors could be detected. The low model R-square of 0.09 however points out a large error variance not explained by the model. Further research is needed to identify other important variables.

#### **Recall Confidence (H2 and H6)**

To test the effects of the learning- and choice task-related factors on recall confidence, an ANOVA was carried out (Table 23). Subjects' confidence about their recall accuracy improved significantly with greater use of prices in their choice tasks ( $p = 0.0001$ ) and with the presence of learning intentions ( $p = 0.0001$ ). The two factors explained 23 percent of the variations in recall confidence.

#### **Recognition Accuracy and Confidence (H7 and H8)**

Hypotheses 7 and 8 respectively postulates that subjects' accuracy and confidence in a price recognition test will improve with greater use of price in their choice decisions. Recognition accuracy was operationalized as the number (or proportion) of correct responses. Before H7 was tested, a test of independence between the two factors was carried out. The contingency table and the chi square test statistic are presented in Table 24. Having satisfied the independence requirement, analyses of variance with proportion correct response as a dependent

**Table 23**  
**Analysis of Variance with Recall  
Confidence as a Dependent Variable**

<b><u>Source</u></b>	<b><u>DF</u></b>	<b><u>ANOVA SS</u></b>	<b>F</b>	<b>P-Value</b>
Task	2	18850	13.70	0.0001
Learning	1	51600	74.98	0.0001
Task * Learning	2	2419	1.76	0.1739
Error	354	243626		

Model R-Square = 0.23

**Table 24**  
**Test For Independence Between Experimental Factors**

**A. Contingency Table for Correct Recognition**

Choice Tasks	Learning		Total
	Incidental	Intentional	
Non-Price	8	31	39
Mixed	23	37	60
Price	27	47	74
Total	58	115	173

<b>B. <u>Test Statistics</u></b>	<b>DF</b>	<b>Value</b>	<b>P-Value</b>
Chi-Square	2	3.877	0.144
Likelihood Ratio	4	4.120	0.127

measure were carried out. The ANOVA tested the log-linear model using a maximum likelihood estimation procedure (Table 25). The test provides support for a significant choice task main effect ( $p = 0.0001$ ). The results also show a significant learning main effect ( $p = 0.0001$ ) although no such hypothesis was proposed. This implies that prelearning instructions about subsequent memory tests not only improved the recall performance but the recognition performance as well, pointing to the superiority of recognition tests across learning conditions.

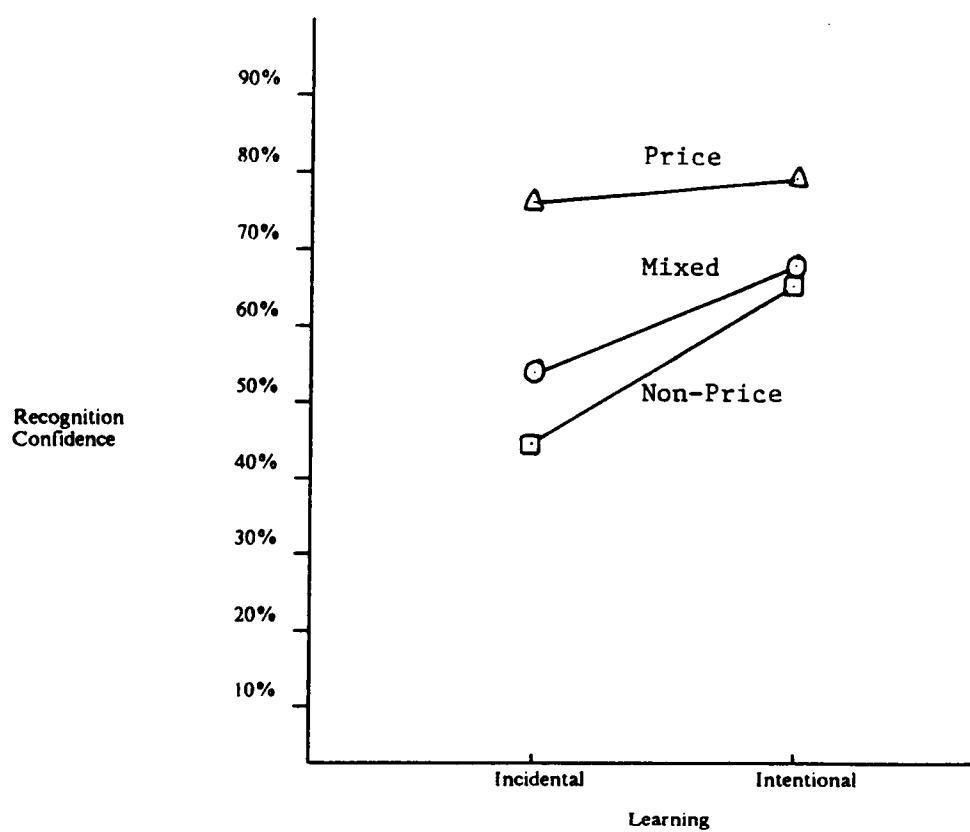
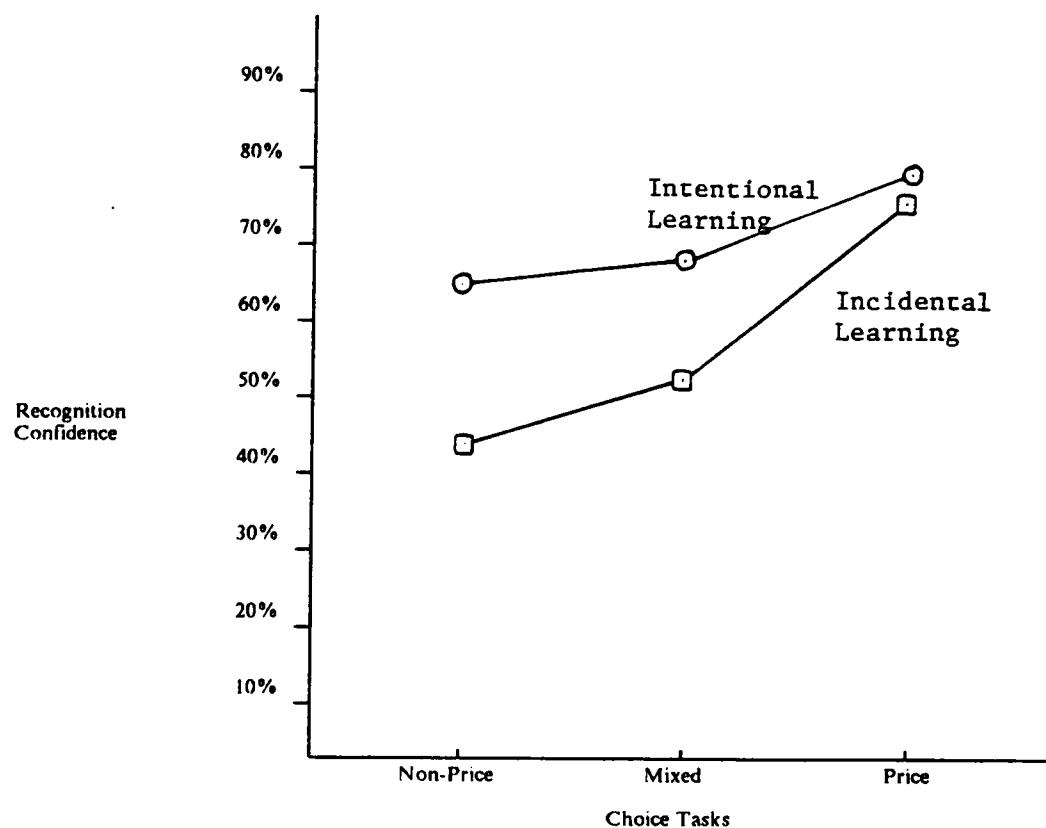
Hypothesis 8 was tested in an ANOVA with recognition confidence as a dependent measure (Table 26). The test not only found significant main effects for both factors, it also showed an interaction between choice task and learning intention.

To further analyze the interaction effect, the cell means of recognition confidence were plotted in Figure 31. It is clear that the difference in recognition confidence between the intentional and incidental group tends to narrow with increase use of price during the choice process. In other words, when buyers use price as an overriding choice criteria, their confidence about recognition accuracy may not be significantly improved due to intentional learning.

#### **Relative Recall Accuracy and Confidence (H9, H10, and H16)**

It was hypothesized that when buyers make their choice decisions based on prices, they will exhibit greater accuracy and confidence in

**Figure 31**  
**Main- and Interaction-Effect on Recognition Confidence**



**Table 25**

**Analysis of Variance with Proportion Correct as a  
Dependent Measure of Recall Accuracy**

**Log-Linear Model (Maximum Likelihood Estimates)**

<b><u>Source</u></b>	<b><u>DF</u></b>	<b><u>Chi-Square</u></b>	<b><u>P-Value</u></b>
Intercept	1	1.00	0.3165
Task	2	22.33	0.0001
Learning	1	36.99	0.0001
Task * Learning	2	2.85	0.2406

**Table 26**  
**Analysis of Variance with Recognition Confidence  
as a Dependent Variable**

<b><u>Source</u></b>	<b><u>DF</u></b>	<b><u>ANOVA SS</u></b>	<b>F</b>	<b>P-Value</b>
Task	2	35085	29.32	0.0001
Learning	1	16741	27.98	0.0001
Task * Learning	2	4413	3.69	0.0260
Error	354	211836		

Model R-Square = 0.21

remembering the relative expensiveness rank of the chosen item than recalling their exact prices (H9 and H10). The summary results of accuracy and confidence in exact price and relative price recall tests are given in Table 27.

It is clear that H9 is not supported. In fact, subjects in the price-based choice task were considerably less accurate in their ranking responses than in their exact price recall. There can be one explanation for this finding. The subjects in this choice task group made their selections on the basis of lowest unit prices, but they were asked to rank the items in terms of their item prices. This made the relative recall test extremely difficult for the subjects in this group and many of them indicated the item ranks based on their unit prices rather than item prices. Thus, unless the lowest priced item also had the lowest unit price, their ranking was incorrect. A discussion with the subjects in this group confirmed the explanation.

One interesting implication can be drawn from this finding. When buyers use unit price information for making choice decision, they rank the items in their minds in terms of unit prices rather than the item prices. To test this possibility, subjects' rankings accuracies were computed on the basis of unit prices rather than item prices and compared against the recall accuracies (Part D of Table 27). The relative recall accuracy was found to be greater than exact price recall accuracy at a significance level of 0.18. One of the reasons why the difference did not come out to be more significant is because some subjects followed the instruction and tried to rank on the basis of unit prices. If such in-

Table 27

**Comparing Exact Price and Relative Price Recall Scores for Price-Based Choice Groups**

		<u>Means</u>	<u>S.D.</u>
<b>A. <u>Exact Price Recall</u> (N = 120)</b>			
a. Number (or percentage) Correct	58 (48.33%)	0.50	
b. Correlation between Correct and Recalled Price	0.90		
c. Confidence	59.63	26.38	
<b>B. <u>Relative Price Recall</u> (N = 120)</b>			
a. Number (or percentage) Correct	22(18.33%)	0.39	
b. Correlation between Correct and Recalled Rank	0.12		
c. Confidence	70.85	29.58	
<b>C. <u>Hypotheses Testing</u></b>			
<u>Hypotheses</u>	<u>Nature of Test</u>	<u>Test Statistic</u>	<u>Test Value</u>
H9	Difference in Proportions	Z	-4.930
H10	Differences in Mean Confidence	Scheffe's F (df = 1,238)	9.61
			0.0001
<b>D. <u>Test of H9 Using Relative Ranks Based on Unit Prices</u></b>			

- (i) Number (or percentage) correctly recalled (N = 120) = 58 (48.33%)
- (ii) Number (or percentage) correctly ranked based on unit prices (N = 120) = 65 (54.17%)
- (i) Z score for Difference in Proportion = 0.91
- (ii) Difference is significant at  $\alpha = 0.18$

struction was not provided, perhaps greater relative recall accuracy (based on unit prices) would have been observed.

The above explanation is further corroborated by the fact that the subjects' significantly greater confidence in their ranking responses (based on unit prices) than in their actual price recall (Table 27). Therefore, when subjects used unit prices in their choice decisions, they exhibited substantially greater confidence about the item ranks based on unit prices than their confidence about actual price recall.

The last hypothesis involving relative price recall (H 16) postulates that prelearning instruction about subsequent memory tests will not significantly improve buyers' ability to rank items in terms of their expensiveness. This hypothesis was tested by comparing the proportion correct in relative recall test for the two groups (Table 28). The chi-square test failed to reject the null hypothesis of no difference ( $p = 0.345$ ). This implies that encoding of relative prices is influenced by buyers' choice-task related factors rather than their anticipation of future recall of exact price.

#### COMPARING RECALL AND RECOGNITION TESTS

Six hypotheses (H3, H4 and H11 - H14) were postulated regarding the superiority of a recognition test over a recall test involving price stimuli across different choice tasks and learning conditions.

**Table 28**

**Comparing Relative Price Recall Scores Between  
Incidental and Intentional Learning**

**A. Contingency Table**

	Incidental	Intentional	Total
Correct	9	13	22
Incorrect	51	47	98
Total	60	60	120

<b>B. Test Statistic</b>	<b>Value</b>	<b>D.F.</b>	<b>P-Value</b>
Chi-Square	0.891	1	0.345

### Overall Comparison between Recall and Recognition

H11 and H12 postulate that, overall, the subjects will exhibit greater accuracy in a recognition test than in a recall test. The aggregate means of recall and recognition accuracy and confidence across all learning and choice task groups are summarized in Part A in Table 29.

Instead of testing for differences in the aggregate proportion correct responses in the recall and recognition tests, the effect of the memory test was tested by including memory test as a third factor (in addition to choice task and learning) with two levels. The analysis of variance was carried out using the log-linear model with maximum likelihood estimations (Part B of Table 29). All possible interaction terms were also included in the model specification. As postulated, the overall improvement in recognition accuracy turned out to be statistically significant in presence of the other two factors ( $p = 0.0001$ ). This implies that the recognition accuracy was greater than recall accuracy not only at the aggregate level, but also at each level of learning and choice tasks.

A similar procedure was carried out to test if, overall recognition confidence was greater than recall confidence (H12). As postulated, the recognition confidence was found to be significantly greater than recall confidence ( $p = 0.0001$ ) in presence of choice task and learning-related factors (Table 30).

**Table 29**

**Test for Overall Difference Between  
Recall and Recognition Tests**

**A. Summary Results**

<u>Memory Tests</u>	<u>Means</u>	<u>S.D.</u>
1. Recall (N = 360)		
(a) Number (percentage) Correct	122 (33.89%)	
(b) Confidence	49.89	29.69
2. Recognition (N = 360)		
(a) Number (percentage) correct	173 (48.06%)	
(b) Confidence	64.99	27.33

**B. ANOVA Using Loglinear Model  
(Maximum Likelihood Estimates)**

<u>Source</u>	<u>DF</u>	<u>Chi-Square</u>	<u>P-Value</u>
Intercept	1	27.76	0.0001
Task	2	42.75	0.0001
Learning (LRNG)	1	65.93	0.0001
Memory Test (MTEST)	2	15.53	0.0001
Task * LRNTG	2	3.28	0.1944
Task * MTEST	2	0.17	0.9204
LRNG * MTEST	1	0.00	0.9536
Task * LRNG * MTEST	2	0.48	0.7860

**Table 30**

**Analysis of Variance to Test the Overall Difference  
Between Recall and Recognition Confidence**

<b><u>Source</u></b>	<b>DF</b>	<b>ANOVA SS</b>	<b>F</b>	<b>P-Value</b>
Task	2	13125	16.52	0.0001
LRNG	1	15844	39.90	0.0001
MTEST	1	10294	25.92	0.0001
TASK * LRNG	2	1481	1.87	0.1580
TASK * MTEST	2	338	0.43	0.6540
LRNG * MTEST	1	1208	3.04	0.0830
TASK * LRNG * MTEST	2	220	0.28	0.7581
ERROR	179	66716		

Having established the overall superiority of a recognition test over a recall test, the performance in the two memory tests for some specific learning and choice task conditions were compared.

#### Comparing Recall and Recognition for Incidental Learning

Hypotheses 3 and 4 postulated that when subjects learn about prices without specific intent to memorize (incidental learning), the recognition accuracy and confidence will be greater than recall accuracy and confidence respectively. To test H3, the proportions correct in recall and recognition are compared (Table 31) and recognition accuracy was found to be significantly greater than recall accuracy for subjects in the incidental learning group ( $p = 0.004$ ).

H4 was tested by comparing the mean recall and recognition confidence for subjects in the incidental learning group (Table 32). The hypothesis was supported at the 0.0001 level of significance.

#### Comparing Recall and Recognition for Non-Price Based Choice Task

Hypotheses 13 and 14 postulated superior recognition test performance (than recall) for subjects performing non-price based choice tasks. The mean scores of recall and recognition accuracy and confidence for subjects in this task group are provided in Table 33. Both recognition

**Table 31**

**Comparing Recall and Recognition Accuracies  
for Subjects in Incidental Learning Condition**

**A. Contingency Table**

	Recall	Recognition	Total
Correct	36	58	94
Incorrect	144	122	266
Total	180	180	360

<b>B. Statistic</b>	<b>D.F.</b>	<b>Value</b>	<b>P-Value</b>
Chi-Square	1	6.968	0.008
Likelihood Ratio	1	7.019	0.008

**Table 32**

**Comparing Recall and Recognition Confidence  
for Subjects in Incidental Learning Condition**

	<u>Mean</u>	<u>S.D.</u>
Recall Confidence (N = 180)	37.92	27.89
Recognition Confidence (N = 180)	58.17	27.48

<u>Under Test</u>	<u>Hypothesis Test</u>	<u>Nature of Statistic</u>	<u>Test Values</u>	<u>Level of Significance</u>
H4	Difference in Mean Confidence	Scheffe's F (df = 1,358)	48.18	0.0001

**Table 33**

**Comparing Recall and Recognition Performance  
for Subjects in Non-Price-Based Choice Tasks**

**A. Proportion Correct**

	Recall	Recognition	Total
Correct	24	39	63
Incorrect	96	81	177
Total	120	120	240

Chi-Square (df = 1) = 4.843 (p = 0.028)

**B. Confidence**

**Means**

**S.D.**

Recall Confidence (N = 120)                    42.29                    32.71  
Recognition Confidence (N = 120)                55.58                    30.65

Scheffe's F (df = 1, 238) = 26.69 (p = 0.0001)

accuracy and confidence was found to be significantly greater than recall accuracy and confidence respectively ( $p = 0.028$  and  $p = 0.0001$ ).

Comparing Recall and Recognition Accuracies for Subjects in Intentional Learning and Price-Based Choice Tasks

Hypothesis 15 postulates that when buyers use prices extensively as their choice criteria and make an explicit attempt to memorize prices for later use, the difference between recall and recognition tends to decrease, so much so that recall accuracy may not be significantly less than recognition accuracy. To test the hypothesis, the proportion correct in recall and recognition for this experimental condition was compared (Table 34). Although the null hypothesis of no difference between recall and recognition performance could not be rejected at a probability level of 0.05, the support of H15 is clearly not convincing.

To explore the results further, the choice task and intentional learning manipulation check items for this group was reanalyzed and the summary results are given below:

	<u>Mean</u>	<u>S.D.</u>
Usage or attention paid to Price information during the choice process	4.87	0.30
Attempted to memorize in response intentional learning induction	4.07	1.07

**Table 34**

**Comparing Recall and Recognition for Price-Based  
Task and Intentional Learning Group**

**A. Contingency Table**

	Recall	Recognition	Total
Correct	38	47	85
Incorrect	22	13	35
Total	60	60	120

<b>B. <u>Test Statistics</u></b>	<b>DF</b>	<b>Value</b>	<b>P-Value</b>
Chi-Square	1	3.267	0.071
Likelihood Ratio	1	3.295	0.069

It appears that the choice task manipulation has dominated the intentional learning induction in that for some subjects the learning of price information took place incidental to their choice rather than with specific intent to memorize for later recall.

### Section Summary

Table 35 summarizes the test results of all the hypotheses that were tested in this section. Out of the sixteen hypotheses tested, fourteen were supported conclusively. One hypothesis (H15) had moderate support and one hypothesis (H9) was not supported. As discussed in the section, the lack of support of these two hypotheses essentially is due to methodological reasons rather than flaws in the conceptualization of the hypotheses.

### ALTERNATIVE EXPLANATIONS

Even though the data supported most of the research hypothesis, it is useful to consider if there are any alternative explanations for the research results. Some of the potential confounds could be product-related, price-related, and subject-related.

**Table 35****Summary Results of Hypotheses Tested**

Hypotheses Under Test	Operational Dependent Measure Used	Tables Where Results Shown	Whether Supported	Test Statistics Used	Values the Test Statistics	Probability Level
H1	(a) Percent Correct Recall (b) Abs. Recall Error	Table 21	Yes	Chi-Square	21.50	0.0001
H2	Recall Conf.	Table 22	Yes	F	6.12	0.0138
H3	Percent Correct Confidence	Table 23	Yes	F	74.98	0.0001
H4	(a) Percent Correct Recall	Table 31	Yes	Chi-Square	8.46	0.0040
H5	(b) Abs. Recall Error	Table 32	Yes	Scheffe's F	48.18	0.0001
		Table 21	Yes	Chi-Square	34.61	0.0001
H6	Recall Conf.	Table 22	Yes	F	13.83	0.0001
H7	Percent Correct Recognition	Table 23	Yes	F	13.70	0.0001
H8	Recog. Conf	Table 25	Yes	Chi-Square	22.33	0.0001
H9	Percent Correct Confidence	Table 26	Yes	F	29.32	0.0001
H10	Percent Correct Confidence	Table 27	No	Z	-4.93	0.9999
H11	Percent Correct Confidence	Table 27	Yes	Scheffe's F	9.61	0.0001
H12	Percent Correct Confidence	Table 29	Yes	Chi-Square	15.53	0.0001
H13	Percent Correct Confidence	Table 30	Yes	F	25.92	0.0001
H14	Percent Correct Confidence	Table 33	Yes	Chi-Square	4.84	0.0280
H15	Percent Correct Confidence	Table 33	Yes	Scheffe's F	26.69	0.0001
H16	Percent Correct Confidence	Table 34	Yes	Chi-Square	3.27	0.0710
		Table 28	Yes	Chi-Square	0.89	0.3450

### **Product-related Confounds**

In order to check if the variations in subjects' recall and recognition test performances could be explained by product differences, the accuracy scores of these two memory tests across the four different products were compared (Table 36). The chi-square test could not reject the null hypothesis of no product-related difference in both recall and recognition accuracies.

As a further test, two additional analyses of variance were carried out with product as a third factor (with four levels) along with two original experimental conditions (Table 37). These analyses also produced the same results in that product-related difference could not explain the significant variations in recall and recognition accuracies in presence of the learning and choice-task-related factors.

So far as recall and recognition confidence is concerned, it was decided to test the full model which included product and memory test as two within-subjects factor in addition to choice task and learning (both between subjects factors). Thus the design was:

$$2 \text{ (Learning)} \times 3 \text{ (Task)} \times 4 \text{ (Products)} \times 2 \text{ (Memory Tests)}$$

Since, memory tests and products were within-subjects repeated measures, a new variable called "subjects" was created and used as a blocking factor before the effects due to products and memory tests could be tested. The model statement and ANOVA table are presented in Table 37(A). When testing for task and learning effects, the mean square for subjects' within task and learning pooled across all six cells was used. However,

**Table 36**  
**Influence of Products on Recall and Recognition**

<u>Products</u> (N = 90)	<u>Orange Juice</u>	<u>Canned Soup</u>	<u>Breakfast Cereal</u>	<u>Pasta Dinner</u>
Correct Recall	26	32	30	34
Correct Recognition	44	49	40	40

<u>To Test</u>	<u>Test Statistic</u>	<u>DF</u>	<u>Value</u>	<u>P-Value</u>
Effect on Recall	Chi-Square	3	1.736	0.629
Effect on Recognition	Chi-Square	3	2.437	0.487

**Table 37**  
**Analysis of Variance with Product as a Factor**

**A. Recall Accuracy (Maximum Likelihood Estimates)**

<u>Source</u>	<u>DF</u>	<u>Chi-Square</u>	<u>P-Value</u>
Intercept	1	38.00	0.0001
Task	2	21.48	0.0001
Learning	1	29.96	0.0001
Product	3	2.02	0.5678
Task * Learning	2	1.16	0.5610

**B. Recognition Accuracy (Maximum Likelihood Estimates)**

<u>Source</u>	<u>DF</u>	<u>Chi-Square</u>	<u>P-Value</u>
Intercept	1	1.01	0.3161
Task	2	22.48	0.0001
Learning	1	2.89	0.0001
Product	3	2.89	0.4088
Task * Learning	2	2.86	0.2389

**Table 37(A)**

**Effect of Products on Recall and Recognition Confidence**

**A. Full Model**

**Confidence = Task LRNG Task \* LRNG Subject (Task LRNG)  
PROD MTEST TASK \* MTEST LRNG \* MTEST**

**B. ANOVA Table**

<b>Source</b>	<b>DF</b>	<b>ANOVA SS</b>	<b>F</b>	<b>P-Value</b>
Task	2	51397	9.16	0.0003
LRNG	1	63563	22.66	0.0001
Task * LRNG	2	6068	1.08	0.3437
Sub (Task LRNG)	84	235637	7.95	0.0001
MTEST	1	41027	116.27	0.0001
PROD	3	3575	3.38	0.0181
LRNG * MTEST	1	4883	13.84	0.0002
Task * MTEST	2	917	1.30	0.2734
Corrected Residual	623	219833		

for testing differences due to product, the residual mean square (corrected for subject-related variations) was used. It may be seen from Table 37(A) that except for a significant product main effect, other results confirm the earlier findings. That is, product-related differences are significant ( $p = 0.018$ ) when tested against corrected residuals. However, given the small variation explained by this factor (0.57%) and considering that other main and interaction effects were still in accordance with the hypotheses, the difference due to product cannot be considered to confound the research results.

#### **Price-related Confounds**

It was recognized that the actual price levels may influence subjects' recall and recognition performance. To check for such differences, the items were divided into two categories depending upon whether their prices were less than or more than one dollar. The prices of canned soups (45¢ to 69¢) and frozen orange juice (83¢ to 99¢) were less than one dollar whereas the prices of pasta dinner (\$1.03 to \$1.29) and breakfast cereal (\$1.53 to \$1.99) were more than one dollar. Based on these two categories, distinction, two analyses of variance were carried out with price level as a third factor. The first ANOVA relates to the recall accuracy (proportion correct) and the second relates to recognition accuracy (proportion correct).

### **Effect of Prices on Recall Accuracy**

The mean recall accuracy and the corresponding ANOVA table are presented in Table 38. Although the recall accuracy for the items greater than one dollar was marginally greater than that of the items with less than one dollar such difference was not found to be statistically significant with or without the two experimental conditions ( $p = 0.4699$ ).

### **Effect of Prices on Recognition Accuracy**

The mean recognition accuracy and the corresponding ANOVA table are presented in Table 39. Subjects were more accurate in recognizing the items priced at less than one dollar (with 2 digits) than the items prices at greater than one dollar. However, the null hypothesis of no difference could not be rejected at  $p = 0.13$  level.

### **Subject-Related Confounds**

It was recognized in Chapter III that subjects' individual characteristics may influence their memory test performance. The possible differences could be on account of their demographic factors (like household income, age, and average per capita spending on grocery items) and their price consciousness. To test for such difference two sets of

Table 38

## Effect of Item Prices on Recall Accuracy

A. Actual Prices

Canned <u>Soup</u>	Orange <u>Juice</u>	Pasta <u>Dinner</u>	Breakfast <u>Cereal</u>
45¢	83¢	\$1.03	\$1.53
49¢	85¢	\$1.09	\$1.59
55¢	89¢	\$1.13	\$1.73
59¢	93¢	\$1.19	\$1.79
65¢	95¢	\$1.23	\$1.93
69¢	99¢	\$1.29	\$1.99

B. Mean Recall Scores

	For Items Less Than <u>One Dollar</u>	For Items More Than <u>One Dollar</u>
Number (or percentage) Correct (N = 180)	58 (32%)	64 (36%)
Chi-Square (df = 1) = 0.446 (p = 0.504)		

C. Analysis of Variance (Maximum Likelihood Estimates)

<u>Source</u>	<u>DF</u>	<u>Chi-Square</u>	<u>P-Value</u>
Intercept	1	37.86	0.0001
Task	2	21.39	0.0001
Learning	1	29.85	0.0001
Price Level	1	0.52	0.4699
Task * Learning	2	1.16	0.5596

**Table 39**

**Effect of Item Prices on Recognition Accuracy**

**A. Recognition Scores**

	<u>For Items Less Than One Dollar</u>	<u>For Items More Than One Dollar</u>
Number (or Proportion) Correct (N = 180)	93 (52%)	80 (44%)
Chi-Square (df = 1) = 1.881 (p = 0.170)		

**B. Analysis of Variance**

<u>Source</u>	<u>DF</u>	<u>Chi-Square</u>	<u>P-Value</u>
Intercept	1	1.01	0.3156
Task	2	22.45	0.0001
Learning	1	37.15	0.0001
Price Level	1	2.24	0.1348
Task * Learning	2	2.86	0.2395

analyses were carried out. In the first set, four analyses of variance were conducted to check if there were any systematic differences on the above-mentioned factors across different experimental conditions. In the second analysis, these individual characteristics were correlated with subjects' memory test performance to ascertain their relationships.

#### **Homogeneity of Subject Characteristics Across Conditions**

Table 40 provides the means and standard deviations of subjects' household income, monthly grocery expenses per household member, age, and their price consciousness scores. Household income was coded on a 1-6 scale as follows:

Less than \$10,000 per year	1
Between \$10,000 and \$25,000	2
Between \$25,000 and \$40,000	3
Between \$40,000 and \$55,000	4
Between \$55,000 and \$70,000	5
More than \$70,000 per year	6

Per capita grocery expenses and age were computed from the subjects' responses. The price consciousness scores were the means of the thirteen item five point agree-disagree scales (see Figure 24).

A careful inspection of Table 40 indicates reasonable homogeneity of subjects on account of their income, spending on grocery items, age, and their price consciousness across experimental conditions. However, some minor variations detected were due to subjects' spending across both

Table 40

**Means (and Standard Deviations) of Subjects' Individual  
Characteristics Across Experimental Conditions**

		Incidental learning	Intentional learning	Marginal Average
<b>Non-Price Choice</b>	Income	2.36(1.15)	3.60(1.18)	3.00 (1.31)
	Grocery Bill	\$ 91.79(43.91)	\$71.94(30.73)	\$ 81.16(38.06)
	Age	36.40(11.20)	35.33(11.02)	35.87(10.93)
	Price Consciousness	3.22(0.72)	3.26(0.90)	3.24(0.80)
<b>Mixed Choice</b>	Income	2.86(1.41)	3.07(1.39)	2.97(1.38)
	Grocery Bill	\$114.28(56.42)	\$97.11(40.25)	\$105.69(48.94)
	Age	37.40(9.63)	38.14(12.32)	37.76(10.81)
	Price Consciousness	3.07(0.61)	3.45(0.72)	3.26(0.69)
<b>Price-based Choice</b>	Income	3.33(1.34)	2.62(1.19)	3.00(1.31)
	Grocery Bill	\$ 97.19(30.55)	\$88.36(44.35)	\$ 92.93(37.42)
	Age	37.00(11.58)	38.53(13.28)	37.77(12.27)
	Price Consciousness	2.96(0.77)	3.58(0.79)	3.27(0.83)
<b>Marginal Average</b>	Income	2.86(1.34)	3.12(1.29)	2.99(1.31)
	Grocery Bill	\$101.52(44.91)	\$85.75(39.29)	\$ 93.54(42.66)
	Age	36.93(10.60)	37.32(12.04)	37.12(11.27)
	Price Consciousness	3.08(0.69)	3.43(0.80)	3.26(0.76)

learning and choice task conditions and subjects' price consciousness across learning conditions.

To explore these differences further, analyses of variance were carried out involving each of these four individual characteristics (Table 41). No significant differences due to subjects' income were found. As pointed out before, a small variation due to subjects' spending was detected across both learning and choice task conditions. That is, subjects assigned to the intentional learning groups were found to spend smaller amount on grocery items than did subjects in the incidental learning group ( $p = 0.08$ ). Also, subjects assigned to the mixed choice condition spent greater amounts on grocery items than subjects in price-based and non-price-based choice task conditions ( $p = 0.08$ ). No differences on account of subjects' age were found across experimental conditions. However, a significant difference due to subjects' price consciousness across learning conditions was detected (Part D of Table 41). That is, the subjects in the intentional learning group were significantly more price conscious ( $p = 0.03$ ) than subjects assigned to the incidental group.

Clearly, the above analyses would suggest that apart from the three situations, subjects were reasonably homogeneous across conditions. However, to complete the analysis, it was necessary to ascertain if these individual factors were related to subjects' memory test performances.

**Table 41**  
**Test For Individual Differences Across Conditions**

**A. Household Income**

<u>Source</u>	<u>DF</u>	<u>ANOVA SS</u>	<u>F</u>	<u>P-Value</u>
Task	2	0.02	0.01	0.99
Learning	1	1.41	0.79	0.37
Error	82	145.56		

**B. Monthly Grocery Expense Per Household Member**

<u>Source</u>	<u>DF</u>	<u>ANOVA SS</u>	<u>F</u>	<u>P-Value</u>
Task	2	8733.58	2.55	0.08
Learning	1	5410.56	3.15	0.08
Error	83	142360.68		

**C. Age**

<u>Source</u>	<u>DF</u>	<u>ANOVA SS</u>	<u>F</u>	<u>P-Value</u>
Task	2	71.50	0.27	0.76
Learning	1	3.29	0.03	0.87
Error	85	11100.85		

**D. Price Consciousness**

<u>Source</u>	<u>DF</u>	<u>ANOVA SS</u>	<u>F</u>	<u>P-Value</u>
Task	2	0.02	0.01	0.99
Learning	1	2.71	4.72	0.03
Error	86	49.32		

### **Impact of Individual Characteristics on Memory Tests**

Table 42 provides the Pearson Correlation coefficients between the individual characteristics and the subjects' accuracies in the three memory tests. While household income, grocery spending, and subjects' age had no significant relationship to their memory test performances, subjects' price consciousness did correlate positively with their recall and recognition accuracies ( $p = 0.05$  and  $0.10$  respectively). Clearly, subjects' price consciousness may have had moderating effect on their recall and recognition scores.

To test this effect, two analyses of covariance were carried out with price consciousness as a covariate (Table 43). ANACOVAs evaluate the effect of the experimental factors after correcting for the influence of the covariate. The analyses indicated that subjects' price consciousness was not a significant covariate in presence of the two experimental factors. Stated differently, the effects of the experimental factors turn out to be statistically significant in spite of the effect of subjects' price consciousness on memory test performance.

The correlation matrix in Table 42 offers two additional interesting findings. First, subjects' price consciousness were found to be negatively correlated with their spending on grocery items. Second, older subjects in the sample were found to spend more on groceries perhaps due to their greater household income.

Table 42

**Correlation Between Subjects' Individual Characteristics and Memory Test Performance**

	RCSCOR	RGSCOR	RLSCOR	PRCONSC	INCOM	PCBILL	AGE
RCSCOR	1.00000 0.00000 90						
RGSCOR	0.75501 0.0001 90	1.00000 0.0000 90					
RLSCOR	0.06217 0.5605 90	0.06581 0.4213 90	1.00000 0.0000 90				
PRCONSC	0.20854 0.0486 90	0.17177 0.1055 90	-0.09500 0.3731 90	1.00000 0.0000 90			
INCOM	0.05052 0.6441 86	-0.01527 0.8890 86	-0.06334 0.5624 86	-0.01292 0.9060 86	1.00000 0.0000 86		
PCBILL	-0.01015 0.9257 87	-0.04462 0.6815 87	0.01012 0.9259 87	-0.21641 0.0441 87	0.16310 0.1382 84	1.00000 0.0000 87	
AGE	0.04039 0.7071 89	0.05496 0.6090 89	-0.06887 0.5214 89	0.10562 0.3246 89	0.45812 0.0001 85	0.24358 0.0238 86	1.00000 0.0000 89

RCSCOR = Number Correctly Recalled

RGSCOR = Household Income

RLSCOR = Monthly Expense on Grocery Items per Household Member

PRCONSC = Subjects' age in years.

INCOM = Household Income

PCBILL = Monthly Expense on Grocery Items per Household Member

AGE = Subjects' age in years.

**Table 43**

**Analyses of Covariance with Subjects' Price Consciousness as a Covariate**

**A. Recall Accuracy**

<b>Source</b>	<b>DF</b>	<b>ANOVA SS</b>	<b>F</b>	<b>P-Value</b>
Task	2	19.12	11.47	0.0001
Learning	1	26.11	31.33	0.0001
Price-Consciousness	1	0.99	1.18	0.2799
Error	85	70.84		

**B. Recognition Accuracy**

<b>Source</b>	<b>DF</b>	<b>ANOVA SS</b>	<b>F</b>	<b>P-Value</b>
Task	2	20.59	11.61	0.0001
Learning	1	32.79	36.98	0.0001
Price-Consciousness	1	0.29	0.33	0.5679
Error	85	75.38		

### Other Potential Confounds

Apart from the product-, price- and subject- related confounds there may be at least three other factors that could influence subjects' memory test performance. These factors are: (1) total shopping time, (2) the elapsed time between stimulus presentation and memory test, and (3) latency or the time to respond to memory tests. To check for these influences, the mean shopping time, elapsed time, and latency across the task and learning conditions were compared (Table 44). It appears that there is a systematic reduction in shopping time across the three choice task conditions. Also, the elapsed time for price-based choice task is smaller than both non-price and mixed choice tasks.

To check if such time differences are significant, three analyses of variance were conducted (Table 45). Clearly, the shopping time differences across choice task conditions are significant ( $p = 0.0001$ ). Also, the elapsed time difference is marginally significant ( $p = 0.1638$ ). However, no other significant differences were found across either choice task or learning conditions.

To analyze the impact of shopping time, elapsed time, and latency on memory performance, these times were correlated against the accuracies and confidence judgments of the three memory tests (Table 46). Total shopping time was not found to have any effect on recall and recognition test performance but it was positively correlated with the ranking accuracy. This finding is consistent with Zeithaml (1981) in that greater shopping (or encoding) time allows buyer to compare the prices of dif-

**Table 44**  
**Comparison of Shopping Time, Elapsed Time, and Latency**

**A. Across Choice Tasks Conditions**

	<u>Shopping Time (secs)</u>	<u>Elapsed Time (secs)</u>	<u>Latency (secs)</u>
<b>Non-Price Choice (N = 120)</b>	118.42 (88.89)*	975.10 (282.10)	202.83 (87.81)
<b>Mixed Choice (N = 120)</b>	85.67 (45.38)	1030.14 (312.90)	229.02 (103.43)
<b>Price-based Choice (N = 120)</b>	76.85 (29.93)	961.11 (293.25)	218.17 (89.27)

**B. Across Learning Conditions**

	<u>Shopping Time (secs)</u>	<u>Elapsed Time (secs)</u>	<u>Latency (secs)</u>
<b>Incidental Learning (N = 180)</b>	97.16 (69.21)	1003.77 (286.31)	220.27 (96.77)
<b>Intentional Learning (N = 180)</b>	90.13 (55.20)	973.80 (307.44)	216.41 (91.19)

\*Figures in parentheses indicate the Standard Deviations.

**Table 45**

**Comparing Differences in Shopping Time, Elapse Time, and Latency**

**A. Shopping Time (seconds)**

<u>Source</u>	<u>DF</u>	<u>ANOVA SS</u>	<u>F</u>	<u>P-Value</u>
Task	2	115123	15.84	0.0001
Learning	1	4438	1.22	0.2689
Task * Learning	2	1363	0.19	0.8291
Error	354	1286278		

**B. Elapsed Time (seconds)**

<u>Source</u>	<u>DF</u>	<u>ANOVA SS</u>	<u>F</u>	<u>P-Value</u>
Task	2	319638	1.82	0.1638
Learning	1	80820	0.92	0.3383
Task * Learning	2	157064	0.89	0.4102
Error	354	31116623		

**C. Latency (seconds)**

<u>Source</u>	<u>DF</u>	<u>ANOVA SS</u>	<u>F</u>	<u>P-Value</u>
Task	2	26950	1.52	0.2192
Learning	1	1345	0.15	0.6967
Task * Learning	2	7852	0.44	0.6418
Error	354	3129763		

ferent items resulting in greater accuracy in ranking them in terms of their expensiveness. However, since the relationship involving the effect of choice task orientations on relative recall accuracy was not hypothesized in this research, the impact of shopping time was not a major concern here.

As regards the elapsed time, Table 46 indicates that there is no impact of elapsed time on any of the memory tests. Therefore, the differences in elapsed time across the choice task conditions did not seem to have confounded the results.

The analysis involving relationship between latency and the different memory tests produced mixed results. Given the crude measure of latency used in this research, these results should be interpreted with some caution. First, separate latency measures for each memory test were not recorded. Instead, the total time for responding to recall, recognition, and relative recall test for each product was recorded. Second, typically subjects took longer to respond to the first set of tests because they had to read the complete instructions involving the tests. Finally, the time measuring instruments were not so sensitive as to capture the effect of latency on memory tests. Given these qualifications, a few comments can be made about the results in Table 46. First, the recognition accuracy is negatively correlated with the latency implying that subjects took a shorter time to respond when they were accurate. Second, latency was found to be positively correlated with subjects' confidence about their response accuracies in each of the tests. Finally, latency did not correlate with recall accuracy.

**Table 46**

**Correlation of Shopping Time, Elapsed Time, and Latency on Memory Test Performance**

	<b>Shopping Time</b>	<b>Elapsed Time</b>	<b><u>Latency</u></b>
<b>Recall Accuracy</b>	-0.03 (0.52)*	0.02 (0.67)	-0.02 (0.73)
<b>Recognition Accuracy</b>	-0.06 (0.26)	-0.02 (0.65)	-0.10 (0.05)
<b>Ranking Accuracy</b>	0.09 (0.10)	-0.00 (0.95)	-0.08 (0.13)
<b>Recall Confidence</b>	-0.08 (0.15)	-0.03 (0.63)	0.07 (0.16)
<b>Recognition Confidence</b>	-0.01 (0.86)	-0.00 (0.96)	0.09 (0.09)
<b>Ranking Confidence</b>	-0.04 (0.51)	0.04 (0.40)	0.21 (0.0001)

\*Figures in parentheses indicate the probability levels.

## SUMMARY

This chapter analyzed the data collected in the experiment and presented the research results. Before testing the postulated hypotheses, the strengths of experimental inductions were assessed and consistency of the responses analyzed. The results showed that both choice task orientations and intentional learning manipulations were effectively induced. However, the choice task manipulation appeared to be stronger than the intentional learning in that subjects' learning of price information was facilitated (or impeded) more an account of their choice tasks rather than the prelearning instructions about a subsequent memory test. In a way this avoided the possibility of intentional learning manipulation washing out the choice task inductions. As regards the consistency of subjects' responses in the memory tests, the statistically significant correlations among the several measures of accuracy and confidence in recall and recognition tests assured that the subjects were consistent in their responses.

Being assured of the strength of manipulations and response consistency, the hypotheses were tested. When the memory test accuracies were operationalized as proportion correct, both general linear models as well as log-linear models were tested using weighted least squares and maximum likelihood estimation procedures. These procedures were necessary to avoid the problems of non-normality and heteroskedastic error terms associated with dichotomous response variables. However, when hypotheses involved continuous responses, analyses of variance were used

with ordinary least square estimations. Also, when tests required comparisons of cell means, Scheffe's F statistic was used to avoid the danger of multiple use of the same information and to protect the overall experiment-wise error rate.

The test results of the sixteen hypotheses were summarized in Table 35. All except one hypothesis (H9) were supported. Several substantive inferences can be drawn from these findings.

(1) The extent to which buyers learn prices during their shopping will vary according to the choice criteria used for buying decisions and their specific intent to remember prices for later use.

(2) Greater use of price than non-price factors in the choice decisions results in buyers' greater ability to recall and recognize prices of the items purchased. The respective confidence about the accuracy also improves.

(3) When buyers anticipate the need for price information and attempts to remember the prices for later use, the ability to recall and their confidence about recall accuracy increases.

(4) Overall, when price information is learned in the process of making a purchase decision, buyers exhibit greater accuracy and confidence in detecting the correct price from among incorrect ones than being able to recall them.

(5) The need for remembering a specific price for later use focuses buyers' attention on the to-be-remembered price. Thus, they may not be

able to rank the items against other items in the product category in terms of their expensiveness.

(6) The lack of support of H9 suggests that when buyers make their purchase decisions based on unit prices, they would, in general, find it easier to rank the items within a product category in terms of their unit prices rather than their item price.

(7) Although previous research has typically associated recall with intentional learning and recognition with incidental learning, this research found improvement in recognition performance as well for intentional learning. That is, subjects' recognition accuracy increased considerably when they were asked to 'remember' the prices. This finding could be due to the nature of the intentional learning induction use where specific memory test (recall or recognition) was not mentioned. Also, it is possible that the relatively stronger choice task manipulation dominated the intentional learning manipulation.

In order to check if there were any alternative explanations for the above findings, additional analyses were conducted. Although some differences were found on account of products, subjects' individual characteristics, encoding time, elapsed time, and latency, such differences were not found to affect the hypothesized relationships.

## CHAPTER V

### SUMMARY AND CONCLUSIONS

The final chapter of this dissertation examines the substantive, theoretical, and methodological implications of the study and provides directions for future research. With this objective, the chapter is organized as follows. The first section summarizes the important conceptual issues and presents a brief overview of the methodology. The second section offers substantive interpretations of the major findings of the research. The third section examines the theoretical and methodological contribution of the research and highlights some implications that managers may derive. The fourth section examines some of the methodological limitations of the study. Finally, some possible extensions and future research opportunities are presented.

#### RESEARCH SUMMARY

This section presents the theoretical background against which the research was conducted and provides a brief overview of the methodology employed.

## Theoretical Background

Price theorists are in general agreement that buyers usually make judgments about price against some pre-formed perceptual reference prices. However, it remains unclear as to how the reference prices are formed in buyers' minds (Monroe 1973; Olson 1980) and how buyers use reference prices during their choice decisions (Rao 1984; Winer 1986). In other words, little is known about how buyers encode and store price information in their memories and how they retrieve the information when they need it for making some purchase decisions.

Evidence suggests that the prices buyers paid (or were exposed to) in their previous purchase occasion(s) produce considerable influence in the formation of reference prices (Scitovsky 1945; Gabor and Granger 1966; Olander 1969; Uhl 1970). But it is unclear as to how buyers process the price information they encounter, how they encode and store the information in memory in a meaningful manner, and how they retrieve the information when such a need arises. In general, early researchers assumed that encoded prices are isomorphic with the physical price stimuli and could be recalled easily whenever buyers needed them (Gabor and Granger 1961; Allen, Harrell, and Hutt 1976). However, recent theorists argue that the encoded prices may or may not match with the physical prices depending upon how buyers choose to interpret the stimuli (Jacoby and Olson 1977; Olson 1980). Therefore, recalling exact prices may not be the only mechanism by which buyers retrieve previously encoded prices (Zeithaml 1981; Powell 1985; Monroe, Powell, and Choudhury 1986).

The issues of encoding, storage, and retrieval were examined in this research in the context of human learning and memory. Previous research indicates that buyers differ in terms of their overall shopping orientations depending upon their individual factors and shopping goals (Guiltinan and Monroe 1980; Dickson and Sawyer 1986). Because of such differences, the manner in which they encode, store, and retrieve price (or other information) differs depending primarily upon the learning plan they employ and the nature of choice tasks they perform (Bettman 1979b). Assessment of learning therefore involves understanding how buyers encode information and then administering retrieval tasks (or memory tests) which are compatible with the way information was originally encoded.

The main problem in selecting appropriate memory tests lies in the researcher's inability to make an a priori and independent assessment of the encoding levels. One way to address this problem would be to administer several memory tests and then use the relative successes or failures to respond in these tests to infer about original encoding. In this research, the objective was to induce in a laboratory setting different learning plans and choice task orientations, to simulate specific characteristics of different types of grocery shoppers and then administer different memory tests so that some inferences can be drawn as to how price information was encoded by shoppers under different learning and choice task conditions. Thus, this research was not interested in whether subjects did or did not learn price information. Instead, the objective was to develop appropriate memory tests that allow for better inference

as to how buyers encoded information and to use these memory test in subsequent field tests for validation purposes.

With this background, it would be useful to summarize the effects of learning plans and choice task orientations on buyers' encoding, storage and retrieval processes.

### **Plans of Learning**

The plans that buyers adopt for learning price information depends upon their relative reliance on their internal memory or external sources for price information (Bettman 1979b). Typically, when buyers anticipate that the required price information may not be easily available from external sources (e.g. in store price comparisons), they would encode the information in a way that allows them to reconstruct the previously encountered stimuli without external cues (Bettman 1979a; b). This type of learning is referred to as intentional learning and is usually associated with successful recall performance (Deese 1964; Tversky 1973).

However, in most other purchase situations, buyers may perceive little need for memorizing price information for later recall because the required information is available from external sources (Dickson and Sawyer 1986). However, this perception does not necessarily mean that buyers have no memorial representations of previously encountered prices. In such situations, and if price is an important choice criterion, buyers may use the externally observed prices as cues to compare against the internal reference price (Bettman 1979a; b). This type of learning is

referred to as incidental learning and is usually associated with successful recognition performance (Powell 1985; Monroe, Powell, and Choudhury 1986).

### **Choice Task Orientations**

While plan of learning is important, buyers' learning of price information is also affected by the nature of the choice tasks they perform. Previous research indicates that shoppers differ in terms of their perceived importance of price and non-price factors in a given choice decision (Dickson and Sawyer 1986). Buyers who make their decisions based on non-price attributes are usually distracted from price information, and thus learning price information may not be effective. It is possible that a portion of such buyers may not even be cognitively exposed to prices even though such information was available to them.

On the other hand, some buyers may guide their buying decisions simply on the basis of price-related factors. These buyers are likely to process price information elaborately, compare prices of different items within a product category, and thereby produce a stable memory trace of the previously encountered prices. These buyers are likely to be able to recall and recognize prices more accurately than the buyers who use non-price factors in making choice decisions. Also, these price-oriented buyers should be able to rank correctly different items within a product category in terms of their relative expensiveness.

Given the above theoretical explanations, this research argues that the manner in which buyers encode and store price information will vary depending upon their learning plans and their choice task orientations. As far as retrieval is concerned, buyers are postulated to be more successful when the retrieval tasks match the encoding process than when they do not. Several hypotheses involving the relationships between learning- and choice task-related factors and retrieval performance were proposed and tested in a laboratory experiment.

#### **Overview of Methodology**

Two levels of learning (incidental and intentional) and three levels of choice task orientations (non-price, mixed, and price) were fully crossed in a  $2 \times 3$  factorial between-subjects (on both factors) design. Ninety women shoppers after being randomly assigned to each of the six experimental conditions (fifteen subjects per cell) took part in a simulated grocery shopping where they were provided with salient attribute information about seven packaged food products. Subjects selected one item from each of the seven categories using specific choice criteria corresponding to different choice task orientations. Intentional learning was induced by alerting the subjects about a possible memory test involving prices of selected items. No such instructions were given to the subjects in incidental learning conditions.

After completion of the shopping task, subjects were given recall, recognition, and relative recall tests involving prices of four of their

selections. The scores from these memory tests were used to test the hypotheses.

### SUBSTANTIVE FINDINGS

Several substantive inferences regarding the effects of learning-and choice task-related factors on buyers' processing and retrieval of price information can be drawn from the research results.

#### **Learning**

The research found that when subjects were told that they would need the price information for later use and that such information will not be available to them from external sources, they were more successful in recalling the prices than the subjects who were not given such instruction. The latter group of subjects however was more accurate recognizing the prices when these were presented externally.

Substantively, the results imply that when shoppers place more reliance on internal memory than external sources for price information (for example, shoppers comparing prices of different stores and prices of one store is not available at the other) they are, in general able to recall prices better than in situations when reliance is placed primarily on external sources (for example, shoppers visiting a store and making decisions simply based upon information available at the store). While these latter group of shoppers are unable to correctly recall previously

encountered prices, they would be relatively more accurate in recognizing them if these prices are presented to them.

Based on these findings, it can be concluded that since most purchase decisions involving low-priced frequently purchased grocery items take place at the point-of-purchase, recognition (rather than recall) appears to be a more likely mechanism by which buyers retrieve price information from memory.

### **Choice Tasks**

The research found support for the hypothesis that greater usage of price-related factors than non-price-related attributes results in greater memorability, and therefore better retrieval performance (in both recall and recognition) of price information. This implies that the buyers whose buying decisions are guided primarily by non-price factors like brand name, nutritional values, and convenience pay less attention to prices. Therefore, for these shoppers, in-store price information will have less impact on the formation (or change) of their reference prices. Although not examined in this research, these shoppers may have an approximate idea of price in that they may be able to tell, with some degree of confidence, whether the price falls within a broad price range or whether the price had a specific first digit.

On the other hand, the shoppers whose buying decisions were guided by price-related factors were found to pay closer attention to prices of not only the items they selected but also other items in their choice set.

These shoppers had a stable memorial representation of the prices they paid and were more successful in recalling and recognizing them. Also, these shoppers were found to have a fairly accurate idea about the relative expensiveness of the items. However, this research found that when buyers use unit prices (rather than item prices) to make their purchase decisions, they ordered the expensiveness of different items based on their unit prices rather than the item prices.

Finally, when buyers use both price and non-price factors in their buying decisions, the extent to which they learn price information depends upon the complementarity or disparity of the information. In this research, the subjects in the mixed task group were asked to process price and nutritional information. While these subjects performed more accurately in the memory tests than the subjects in the non-price-based choice task condition, their accuracy was lower than subjects in the price-based choice task condition who used item prices and weights (or servings) to make their purchase decisions. Item prices and item weights seemed to have complemented each other more effectively when choices are based on unit prices than when buyers used price and nutritional values to find the most nutritious item with the lowest price.

#### **Superiority of a Recognition Test**

This research found that subjects were more accurate in a recognition test than in a recall test not only for incidental learning conditions but also for all levels of learning and choice task conditions. In other

words, the subjects who recalled the prices correctly also identified the correct price from a set of distractor prices. Moreover, the subjects who could not recall the correct prices were more able to recognize them when they were presented externally. Substantively, this result implies that buyers generally may expect that prices will be available from external sources providing them with cues that activate 'the retrieval process rather than having to reconstruct the stimuli without external help. Therefore, in most grocery shopping situations, recognition appears to be more appropriate test to assess buyers' price knowledge than recall.

However, the superiority of recognition performance over recall performance tends to decrease with buyers' greater expectation of a future need to recall prices and with greater use of prices in the purchase decisions. In fact, this research found that when subjects were alerted about a possible memory test and when they made their selections based on price-related factors, the recognition accuracy (and confidence) was not statistically significantly greater than recall accuracy (and confidence).

#### CONTRIBUTIONS OF THE RESEARCH

This research makes several important contributions at the conceptual and methodological levels. At the conceptual level, this research uses the theories of human learning and memory to develop a conceptual framework for understanding how buyers encode, store, and retrieve price

information. The framework is expected to be useful for guiding future research in price awareness and price perception. At the methodological level, the research develops an argument for and finds empirical support for using different memory tests to measure buyers' price knowledge. Practitioners are also likely to benefit from this research by understanding some of the determinants of price awareness and by being able to segment the market on these dimensions. These issues are expanded below.

### **Theoretical Contributions**

Consumer information processing models involving price stimuli have generally considered a hierarchical ordering of the three cognitive processes: encoding, storage, and retrieval (Jacoby and Olson 1977; Helgeson and Beatty 1985). According to these models, once price information is encoded, it is stored in some memory locations, and is retrieved by buyers when the associative network connecting the target price information and other information is activated. While these models are useful in identifying the three critical memory processes, it is unclear as to why some information is encoded while other information is not used, and why different buyers encode similar information differently.

The first, and perhaps the most important theoretical contribution of this research examines the interrelationships among the three cognitive processes. The literature review brings out the following important issues:

1. Buyers may encode price information depending upon (a) whether or not they perceive the need for its storage (Bettman 1979b),

and (b) the nature of retrieval tasks they expect to encounter when they need the information (Newell and Simon 1958; Tversky 1973).

2. The encoding process determines the storage locations depending upon how elaborately the information was processed and what kinds of linkages are established as a result (Craik and Lockhart 1972). Buyers may pay only cursory attention to price or may process it in a more elaborate fashion, again depending upon the perceived need to store price information and the expected retrieval tasks. The more extensive the processing of price information, the greater is the likelihood that the price will be retained in memory (Helgeson and Beatty 1985).
3. Successful retrieval requires a close correspondence between the encoding process and the retrieval mechanism (Tulving and Thomson 1973). One problem of selecting an appropriate retrieval task (or memory test) lies in making an *a priori* assumption about the original encoding. Fortunately, the reticulated view proposed in this research alleviates a part of the problem. For example, if the researcher can make an *a priori* assessment about buyers' potential needs for storing price information and about the kinds of retrieval mechanism they would normally employ, appropriate memory tests approximating the original encoding could be administered. In this research, it was assumed that buyers who rely on external sources for price information would normally expect to have the information presented to them. For these buyers, a recognition test would be a more appropriate memory test than recall.
4. The failure to retrieve price information may not be unambiguously interpreted because such failure may imply either lack of information in storage or ineffectiveness of the retrieval mechanism (Eysenck 1977). Thus, conclusive inference about buyers' knowledge of price may be problematic.

The second theoretical contribution of the research derives from the above theoretical issues. Previous research has typically used shopper demographics, visible point-of-purchase behavior, product- and store-related characteristics to explain buyers' retrieval of price information. However, this research argues that understanding buyers' cognitive processes provides a better explanations of the differences in their learning and retrieval of price information. It has been suggested that

learning- and choice-task-related factors produce a greater impact on the perceptual process than demographic or other factors. Learning plans simulate the effect of expected retrieval tasks on how price information will be encoded while the choice tasks simulate the extent of information processing elaborations that might take place.

Identification of these two factors is also likely to offer explanations as to how these factors might influence buyers' formations of reference prices. For example, buyers who make purchase decisions based on only non-price factors may not have stable memorial representations of the prices they pay, and thus rely more on point-of-purchase price information when they need it. On the other hand, price-conscious shoppers who also carry out extensive store price comparisons are more likely to have a readily accessible reference price in memory and are more able to retrieve the information without additional external cues.

Finally, this research raises some fundamental questions about the validity of the perfect price information assumption in economic theory. It is clear from the theoretical arguments as well as the empirical results of this research that buyers may not be as knowledgable about prices as economic theory suggests. However, this fact does not necessarily imply imperfect functioning of the market and detrimental consequences on the welfare of buyers and seller as Brown and Oxenfeldt (1972) have predicted. This observation may simply mean that price may not be the only variable that guides buyers' purchase decisions. Also, given the limited cognitive capacity at buyers' disposal and given the numerous

choices available, buyers are selective in their allocation of the cognitive capacity depending upon their needs and goals.

### **Methodological Contributions**

Winer (1986) in his concluding comment emphasized the need for future research to investigate "how price enters the consumer choice process and how reference prices can be better measured" (p. 255). These are the issues of retrieval and how retrieval performance can be used to make inference about buyers' price knowledge. This research takes a step toward addressing this issue.

It has been argued that buyers' recall accuracy alone may not be an adequate (or even an appropriate) measure of their price knowledge. Several different memory tests are necessary to tap different levels of encoding depending upon the learning plans buyers adopt and their respective choice task orientations. This research used exact price recall, recognition, and relative price recall to assess buyers' retrieval performance under different types of encoding. Based upon the results, three important inferences can be drawn:

1. In general, when buyers learn prices in the process of making purchase decisions (incidental learning) and when they expect that price information will again be available to them from external sources, the mechanism through which they would expect to retrieve information is recognition. Since this kind of learning orientation is prevalent in most purchase situations, recognition accuracy is expected to provide a better measures of buyers' price knowledge than recall accuracy.

2. The superiority of recognition performance over recall tends to decrease with buyers' greater expectation of a recall test or need to remember and with greater use of prices in a choice decisions.
3. When buyers make purchase decisions based upon prices of different items in a choice set, they perform better in ranking the expensiveness of the items than being able to recall exact prices of the chosen items.

Apart from using different memory tests, this research makes additional methodological contribution by using subjects' confidence judgments (about their response accuracies) as a supporting measure of knowledge. Use of confidence in addition to accuracy is important because it takes into account subjects' response biases and the effects of guessing.

Third, this is perhaps the only research in price awareness area that employs a controlled laboratory experiment to test the hypotheses. Most research on price awareness has used survey and observational methods and as such has not examined the possibilities of alternative explanations for the results. A detailed investigation was carried out in this research to check the effects of possible confounds like product- and price-related differences, differences due to individual factors, total shopping time, elapsed time, and latency. Except for buyers' price consciousness, the study could not detect significant effects due to these confounding factors on retrieval performance. Therefore, internal validity represents a major methodological strength of this research as compared to previous price awareness research.

Finally, this research can claim to have taken several steps towards achieving statistical conclusion validity. First, the research obtained

sufficient number of observations to achieve required power of the statistical tests. Second, the research used a log-linear model and maximum likelihood estimation procedure to test the effects of experimental factors on the dichotomous response variable. Most previous research (except Dickson and Sawyer 1985) has simply used the test of difference in proportions.

The main difference between the two procedure is that in test of differences in proportions, the populations are assumed to be independent, whereas in the maximum likelihood method, the parameters are estimated on the basis of probability of joint occurrence.

### **Managerial Implications**

Price is often used by managers as an important demand stimulating device. Consistent with the economic view, it is generally assumed that buyers pay close attention to prices, remember them, and make their buying decisions based upon price-related factors. This research found that the extent buyers learn about prices during their shopping trips depends upon their learning plans and the nature of choice tasks they perform. When a segment of buyers is more interested in non-price factors and does not make an attempt to memorize prices for later use, it is unlikely that providing deals or other price-related inducements to this segment would be an effective means to stimulate demand unless believable external reference prices are provided. On the other hand, the price-conscious shoppers who also carry out extensive comparison of prices of different

stores are likely to have more accurate knowledge of prices they pay. It is likely that this segment of shoppers will be more able to detect price changes and likely will alter their buying decisions accordingly. Therefore, it may be useful for managers to examine buyers' learning- and choice task-related factors and appeal to their respective shopping orientations through proper pricing, promotional, and product positioning decisions.

Second, the research found that in grocery shopping situations, recognition is the most likely retrieval mechanism employed by shoppers. Recognition requires buyers to discriminate the previously encountered prices from the ones they are now presented with. Several factors affect successful recognition: closeness of the distractor items, frequency of occurrence, and the time pressure during the retrieval tasks. While the impact of these factors were not tested in this research, several managerial implications can be drawn. For example, when the prices of different items are set very close to each other, buyers' ability to discriminate may decline considerably. On the other hand if the price of an item is set substantially apart from prices of other items, it will be recognized more easily. Similar effects may also take place for buyers' ability to notice price change. For example, a large magnitude of price change will be recognized easily; whereas, a relatively small change will go unnoticed. Also, when the prices of items are changed frequently, buyers may not be able to recognize the change without additional information. But if the price which has remained stable for a fairly long time

is changed, buyers are more likely to notice such change because of buyers' greater ability to discriminate between the two prices.

Finally, the research could not find support for the effects of buyers' demographic factors and product and store characteristics on buyers' learning of prices. This result implies that rather than relying on these factors, managers should examine the cognitive dimensions of buyers more closely to assess their reactions to pricing and price change decisions.

#### LIMITATIONS OF THE RESEARCH

One of the major limitations of this study is its lack of external validity. Although the research used actual grocery shoppers as subjects, several other concerns regarding generalizing the research results remain.

First the research setting in which the subjects made their selections and responded to the memory tests were contrived and artificial. Although an attempt was made to introduce some mundane realism through the cover story and through description of the choice tasks, the realism of context was clearly absent. This limitation was however unavoidable given the requirements of theory testing.

Second, the research operations were obtrusive in terms of forcing the subjects to make selections from only a few alternatives and based on some choice criteria which may not have matched their own. Also, the

product- and price information was altered to avoid confounds and may have produced some impact on their learning and memory test performance.

Third, a number of unspecified variables which may have influenced subjects' learning are either held constant or are assumed to cancel out due to randomization. The effects of these variables at the individual levels were not examined.

Finally, the research methodology, although appropriate for internally valid research results, does not allow generalization of the results to other buyers, other settings, and other product categories.

Apart from the concern of external validity, the research did not properly examine the relationships of encoding time, elapsed time, and latency with the retention test performance because of the non-availability of an appropriate time measuring device. Future research should examine this aspect more carefully.

#### FUTURE RESEARCH

The research opens up several interesting future research opportunities in the price awareness area.

First, the research found that a considerable proportion of subjects could not respond accurately in any of the three memory tests. While possibility of lack of price information in memory cannot be ruled out for some of the subjects, it is likely that others failed to retrieve because of incompatible memory tests. Future research should develop additional memory tests to tap other levels of encoding. Some possible

tests could include buyers' ability to indicate with some degree of confidence the possible range or simply the first digit of price.

Second, future research needs to examine how buyers categorize price information in their memories when the number of stimulus items becomes larger. Also, the effect of closeness or disparity of prices may have some influence on such memory organization.

Third, longitudinal studies with the help of a panel of subjects should examine how buyers' learning and retrieval performance vary over time. Also, the effects of price change (increase or decrease) over time needs to be examined.

Fourth, as a step toward external validity, the research should be replicated in an actual store setting using a panel of grocery shoppers. Subjects could be pre-classified depending upon their shopping strategy so that the experimental manipulation become more meaningful for the respective groups. Also, the research could be replicated using non-grocery products and examine the validity of the postulated relationships on high-priced and less frequently purchased items as well.

Finally, the validity of the theoretical arguments made in this research could be tested for other non-price stimuli like advertisement awareness, brand awareness, and new product awareness.

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## **Appendix A**

**Complete Experimental Procedure: Incidental  
Learning and Non-Price Choice Task (Cell 11)**



THE R. B. PAMPLIN COLLEGE OF BUSINESS

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

*Blacksburg, Virginia 24061*

Thank you for agreeing to participate in this research. We hope, you will find it to be an interesting experience.

The purpose of this research is to investigate how grocery shoppers evaluate different alternatives in a supermarket and how they decide on a particular item to purchase. We propose to do this by developing a situation where you will take part in a grocery shopping trip. However, you will be asked to do the shopping for a friend whose shopping habits may or may not match with your own. That is, instead of employing your own criteria for selecting different items in the store, you will be asked to use the selection criteria that characterize the friend you are going to shop for.

You will be provided with six booklets, each representing a food product category, like canned soup, cold breakfast cereal, and so on. Within each product category, there will be six items. Your task would be to make one selection from each of the six product categories based upon some specific guidelines and instructions. After you have made all six selections, you will be asked to respond to a few questions about your purchase decisions.

To familiarize you with the selection procedures and the criteria your friend uses to make a selection, there will be a practice session and you will have the opportunity to ask any questions that you may have about the task at that time.

Remember, how you make your selections and how you respond to the questions in no way reflect your ability, talent, or actual shopping habits. Your responses will be kept strictly confidential. Do not write your name anywhere in the booklets or the questionnaire.

When you have completed all aspects of this shopping experience, the researcher will provide a more detailed explanation about this investigation.

### General Overview

In the accompanying packet, there are seven booklets arranged in a specific order, marked 0 through 6. Please do not change the order of the booklets.

Booklet No. 0 is to acquaint you with the instructions and to give you an opportunity to practice the selection tasks that you will be asked to perform in the subsequent booklets. After you have completed the task required in Booklet No. 0, you will be able to ask any question that you may have at that time. Once you are clear about the task instructions, we will proceed with the actual shopping trip beginning with Booklet No. 1, then Booklet No. 2, and so on, until you have completed with Booklet No. 6 in the order presented.

As mentioned before, each booklet represents a food product category found in a supermarket:

Booklet	Product Category
0	Canned Vegetables (For Practice)
1	Margarine
2	Pasta Dinner
3	Cold Breakfast Cereal
4	Canned Soup
5	Frozen Orange Juice (Canned)
6	Salad Dressing

Each product category will have six items. For example, in the category of Canned Vegetables, there will be: Cut Beets, Carrots, Whole-leaf Spinach, Mixed Vegetables, Sweet Peas, and Cut Green Beans.

At the beginning of the booklets, there will be a brief description of your friend and the criteria she normally uses when evaluating each item within a product category. Your task will be to use these criteria and to select one item from the six alternatives in each product category. Please try to ignore your personal tastes and preferences to the extent possible and select the items that best match the selection criteria of your friend.

At various stages of your selection process, and filling out the questionnaire, you will be required to record the current time in the designated spaces. For this purpose, a clock is provided in front of you. Please make sure that all of you can see the readings in the clock clearly.

If you have any questions, please ask them now. Otherwise wait for the next instruction.

**1. Please pick Booklet No. 0 marked "Practice Session" and set it in front of you.**

**2. Please do not turn the page of Booklet No. 0 until instructed.**

BOOKLET NO. 0

PRACTICE SESSION

CANNED VEGETABLES

Assume that you are entering the "Canned Vegetables" section of a supermarket. Today, there are six items of canned vegetables available in the store. This booklet contains the necessary information that you will need to make your selection based on the following instructions.

### 1. HOW TO MAKE A SELECTION

Your friend is extremely conscious of her health and nutrition. She watches her weight carefully and performs regular work-outs. When it comes to buying food products, she is not concerned about their prices but she pays a very close attention to calorie and nutritional information and selects the items that are low on calories but high on nutritional values.

The calories generally come from fats, sugar, and carbohydrate contents of the food, whereas the nutritional value mainly comes from the protein and vitamins. Information regarding the calorie contents and the nutritional values of the different items will be provided to you later in this booklet.

A dilemma that a health conscious shopper faces in deciding which item to buy is that the food with low calorie content does not necessarily provide the required nutritional value. Also, the food with high nutritional value does not always ensure low calories. Given this kind of a dilemma, you have decided that you can best serve your friend by carefully examining both the calorie content and the nutritional value of different items and selecting the item that gives the best possible combination of calorie and nutritional value.

However, if you find two items having the same or similarly attractive combinations of calorie and nutrition, you would select the more reputable brand.

### 2. SELECTION

Based upon the above criteria, you are required to select one can of vegetables from the six alternatives given later in this booklet. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selection you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (✓) against the item's name in the Selection Card.

### 3. TIME LIMIT

For this practice session, you will have Five Minutes to make your selection. You will be alerted when the time count begins.

If you have any questions, please stop here and ask. Otherwise, go on to the next page.

1. You have entered the "Canned Vegetables" section of the supermarket. Your time count of five minutes now begins.

2. Please look at the clock in front of you and write below the current time:

Hours   Minutes   Seconds

[   ] [   ] [   ]

Please go to the next page.

CANNED VEGETABLES

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
CUT BEETS	Avondale	15	43¢	4	140	900
JULIENNE CARROTS	Avondale	17	85¢	5	120	960
WHOLE-LEAF SPINACH	Avondale	15	63¢	4	100	664
MIXED VEGETABLES	Avondale	17	45¢	5	140	840
SWEET PEAS	Avondale	17	83¢	5	280	1072
CUT GREEN BEANS	Avondale	20	65¢	7	140	720

(\*) A composite index of Protein and Vitamins contents.

1. To indicate your selection, check (✓) the item selected in the "Selection Card."
2. Please record the current time below as soon as you have checked the "Selection Card":

Hours	Minutes	Seconds

3. Do not turn this page; wait for the next instruction.

### ACTUAL SHOPPING TRIP

Your actual shopping trip is now going to begin. Before you start, please read the following carefully.

#### **1. PRODUCT CATEGORIES:**

You have agreed to purchase for your friend one item from each of the following six food product categories. The supermarket has these product categories arranged in the following order to control the normal traffic flow through the aisles. Therefore, the booklets are arranged in the following sequence and you will have to follow the same sequence while shopping.

1. Margarine
2. Pasta Dinner
3. Cold Breakfast Cereal
4. Canned Soup
5. Frozen Orange Juice (Canned)
6. Salad Dressing

#### **2. TIME LIMIT**

You will have 20 minutes for your entire shopping trip. You will be alerted when the time count begins.

#### **3. HOW TO MAKE A SELECTION**

The following instructions are similar to the one you received for the practice session. Nonetheless, please read them again.

Your friend is extremely conscious of her health and nutrition. She watches her weight carefully and performs regular work-outs. When it comes to buying food products, she is not concerned about their prices but she pays a very close attention to calorie and nutritional information and selects the items that are low on calories but high on nutritional values.

The calories generally come from fats, sugar, and carbohydrate contents of the food, whereas the nutritional value mainly comes from the protein and vitamins. Information regarding the calorie contents and the nutritional values of the different items will be provided to you later in the booklets.

A dilemma that a health conscious shopper faces in deciding which item to buy is that the food with low calorie content does not necessarily provide the required nutritional value. Also, the food with high nutritional value does not always ensure low calories. Given this kind of a dilemma, you have decided that you can best serve your friend by carefully examining both the calorie content and the nutritional value of different items and selecting the item that gives the best possible combination of calorie and nutritional value.

However, if you find two items having the same or similarly attractive combinations of calorie and nutrition, you would select the more reputable brand.

Please go on to the next page.

#### **4. SELECTION**

Based upon the above criteria, select one item from each of the six product categories. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selections you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (✓) against the item's name in the Selection Card.

Please wait for the next instruction

BOOKLET NO. 1

MARGARINE

The time count of 20 minutes now begins. Before turning this page, please write below the current time:

Hours   Minutes   Seconds

[    ] | [    ] | [    ]

Please go to the next page.

**MARGARINE**

Items	Manufacturer or Distributor	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
FLEISCHMANN'S LIGHT	Nabisco	18	99¢	33	2560	256
SHEDD'S SPREAD	Lever Brothers	15	35¢	31	2560	288
BLUE BONNET	Nabisco	17	65¢	32	3200	352
KROGER MARGARINE	Kroger	18	39¢	33	3400	382
PREMIUM MAZOLA	General Foods	18	95¢	33	3200	416
LAND O LAKES	Land O Lakes	17	69¢	32	3400	406

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET NO. 2**

**PASTA DINNER**

**Before turning this page, please write below the current time:**

**Hours      Minutes      Seconds**

**[      ] [      ] [      ]**

**Please go to the next page**

**PASTA DINNER**

Items	Manufacturer	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
<b>DELUXE MACARONI CHEESE</b>	Kraft	8	\$1.13	4	1300	490
<b>EGG NOODLE WITH CHICKEN</b>	Kraft	8	\$1.23	4	760	432
<b>CREAMY PASTA</b>	Lipton	9	\$1.03	5	800	440
<b>VELVEETA SHELLS &amp; CHEESE</b>	Kraft	11	\$1.09	6	750	354
<b>CHEESE SUPREME</b>	Lipton	14	\$1.29	7	1080	540
<b>MACARONI &amp; CHEESE</b>	Kraft's	14	\$1.19	7	750	375

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

BOOKLET No. 3

COLD BREAKFAST CEREAL

Before turning this page, please write the current time below:

Hours   Minutes   Seconds

[    ] [    ] [    ]

Please go to the next page.

**COLD BREAKFAST CEREAL**

Items	Brand	Net Weight Per Box (Ounce)	Price Per Box	Servings Per Box	Calories Per Box	Nutritional Value (*) Per Box
<b>RAISIN BRAN</b>	Kellogg's	20	\$1.93	20	120	452
<b>CORN FLAKES</b>	Kellogg's	18	\$1.73	18	165	480
<b>ALL-BRAN FRUIT AND ALMONDS</b>	Kellogg's	13	\$1.79	13	385	605
<b>RAISIN SQUARE</b>	Kellogg's	17	\$1.99	17	90	225
<b>JUST RIGHT</b>	Kellogg's	13	\$1.53	13	285	526
<b>FROSTED MINI-WHEATS</b>	Kellogg's	16	\$1.59	16	100	265

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

BOOKLET No. 4

CANNED SOUP

Before turning this page, please write the current time:

Hours    Minutes    Seconds

[\_\_\_\_] [\_\_\_\_] [\_\_\_\_]

Please go to the next page

**CANNED SOUP**

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
<b>CURLY NOODLE WITH CHICKEN</b>	Campbell's	10	45¢	2.00	175	103
<b>CREAM OF ASPARAGUS</b>	Campbell's	12	55¢	2.75	248	67
<b>CHICKEN BROTH</b>	Campbell's	11	49¢	2.50	96	44
<b>CREAMY CHICKEN MUSHROOM</b>	Campbell's	10	59¢	2.00	200	185
<b>TOMATO BISQUE</b>	Campbell's	11	65¢	2.50	330	210
<b>CHUNCKY CHICKEN VEGETABLE</b>	Campbell's	11	69¢	1.00	240	200

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

**PLEASE GO TO THE NEXT BOOKLET**

BOOKLET No. 5

FROZEN ORANGE JUICE (CANNED)

Before turning this page, please write the current time:

Hours    Minutes    Seconds

[\_\_\_\_] [\_\_\_\_] [\_\_\_\_]

Please go to the next page

FROZEN ORANGE JUICE

Items	Manufacturer or Distributor	Net Weight Per Can (Fl. Oz.)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
CITRUS HILL	Proctor & Gamble	12	95¢	8	720	1024
FLORIDA GOLD	Lykes Pasco	12	93¢	8	480	600
SUN GOLD	Pace Dairy	13	89¢	9	720	720
SENECA	Seneca Food	12	83¢	8	720	800
MINUTE MAID	Coca Cola	13	99¢	9	800	960
KROGER	Kroger	14	85¢	10	800	840

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

BOOKLET No. 6

SALAD DRESSING

Before turning this page, please write the current time below:

Hours    Minutes    Seconds

|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|

Please go to the next page

SALAD DRESSINGS

Items	Brand	Net Weight Per Bottle (Fl.Oz.)	Price Per Bottle	Servings Per Bottle	Calories Per Bottle	Nutritional Value (*) Per Bottle
CREAMY CUCUMBER	Kraft	8.50	85¢	17	480	696
ROCA BLUE	Kraft	8.00	93¢	16	240	288
CATALINA SPICY SWEET	Kraft	9.00	89¢	18	240	320
PRESTO ITALIAN	Kraft	8.50	99¢	17	400	520
THOUSAND ISLAND	Kraft	8.00	83¢	16	480	672
FRENCH	Kraft	8.50	95¢	17	400	568

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT PAGE

**1. Please record the current time below as soon as you have checked the "Selection Card":**

Hours	Minutes	Seconds
[    ]	[    ]	[    ]

**2. You have completed your shopping trip. Please wait for further instructions.**

**3. Please Do not talk with anyone.**

SELECTION CARD

Please check (✓) only one item from each of the following product categories to indicate your selection:

0. CANNED VEGETABLE

- Cut Beets
- Julienne Carrots
- Whole-Leaf Spinach
- Mixed Vegetables
- Sweet Peas
- Cut Green Beans

1. MARGARINE

- Fleischmann's Light
- Shedd's Spread
- Blue Bonnet
- Kroger Margarine
- Premium Mazola
- Land O Lakes

2. PASTA DINNER

- Deluxe Macaroni & Cheese
- Egg Noodle with Chicken
- Creamy Pasta
- Velveeta Shells & Cheese
- Cheese Supreme
- Macaroni & Cheese

3. COLD BREAKFAST CEREAL

- Raisin Bran
- Corn Flakes
- All-Bran Fruit and Almonds
- Raisin Square
- Just Right
- Frosted Mini-Wheats

4. CANNED SOUP

- Curly Noodle with Chicken
- Cream of Asparagus
- Chicken Broth
- Creamy Chicken Mushroom
- Tomato Bisque
- Chunky Chicken Vegetable

5. FROZEN ORANGE JUICE

- Citrus Hill
- Florida Gold
- Sun Gold
- Seneca
- Minute Maid
- Kroger

6. SALAD DRESSINGS

- Creamy Cucumber
- Roca Blue
- Catalina Spicy Sweet
- Presto Italian
- Thousand Island
- French

**Appendix B**

**Complete Experimental Procedure: Intentional  
Learning and Non-Price Choice Task (Cell 12)**

THE R. B. PAMPLIN COLLEGE OF BUSINESS



VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

*Blacksburg, Virginia 24061*

Thank you for agreeing to participate in this research. We hope, you will find it to be an interesting experience.

The purpose of this research is to investigate how grocery shoppers evaluate different alternatives in a supermarket and how they decide on a particular item to purchase. We propose to do this by developing a situation where you will take part in a grocery shopping trip. However, you will be asked to do the shopping for a friend whose shopping habits may or may not match with your own. That is, instead of employing your own criteria for selecting different items in the store, you will be asked to use the selection criteria that characterize the friend you are going to shop for.

You will be provided with six booklets, each representing a food product category, like canned soup, cold breakfast cereal, and so on. Within each product category, there will be six items. Your task would be to make one selection from each of the six product categories based upon some specific guidelines and instructions. After you have made all six selections, you will be asked to respond to a few questions about your purchase decisions.

To familiarize you with the selection procedures and the criteria your friend uses to make a selection, there will be a practice session and you will have the opportunity to ask any questions that you may have about the task at that time.

Remember, how you make your selections and how you respond to the questions in no way reflect your ability, talent, or actual shopping habits. Your responses will be kept strictly confidential. Do not write your name anywhere in the booklets or the questionnaire.

When you have completed all aspects of this shopping experience, the researcher will provide a more detailed explanation about this investigation.

### General Overview

In the accompanying packet, there are seven booklets arranged in a specific order, marked 0 through 6. Please do not change the order of the booklets.

Booklet No. 0 is to acquaint you with the instructions and to give you an opportunity to practice the selection tasks that you will be asked to perform in the subsequent booklets. After you have completed the task required in Booklet No. 0, you will be able to ask any question that you may have at that time. Once you are clear about the task instructions, we will proceed with the actual shopping trip beginning with Booklet No. 1, then Booklet No. 2, and so on, until you have completed with Booklet No. 6 in the order presented.

As mentioned before, each booklet represents a food product category found in a supermarket:

Booklet	Product Category
0	Canned Vegetables (For Practice)
1	Margarine
2	Pasta Dinner
3	Cold Breakfast Cereal
4	Canned Soup
5	Frozen Orange Juice (Canned)
6	Salad Dressing

Each product category will have six items. For example, in the category of Canned Vegetables, there will be: Cut Beets, Carrots, Whole-leaf Spinach, Mixed Vegetables, Sweet Peas, and Cut Green Beans.

At the beginning of the booklets, there will be a brief description of your friend and the criteria she normally uses when evaluating each item within a product category. Your task will be to use these criteria and to select one item from the six alternatives in each product category. Please try to ignore your personal tastes and preferences to the extent possible and select the items that best match the selection criteria of your friend.

At various stages of your selection process, and filling out the questionnaire, you will be required to record the current time in the designated spaces. For this purpose, a clock is provided in front of you. Please make sure that all of you can see the readings in the clock clearly.

If you have any questions, please ask them now. Otherwise wait for the next instruction.

- 1. Please pick Booklet No. 0 marked "Practice Session" and set it in front of you.**
- 2. Please do not turn the page of Booklet No. 0 until instructed.**

BOOKLET NO. 0

PRACTICE SESSION

CANNED VEGETABLES

Assume that you are entering the "Canned Vegetables" section of a supermarket. Today, there are six items of canned vegetables available in the store. This booklet contains the necessary information that you will need to make your selection based on the following instructions.

### 1. HOW TO MAKE A SELECTION

Your friend is extremely conscious of her health and nutrition. She watches her weight carefully and performs regular work-outs. When it comes to buying food products, she is not concerned about their prices but she pays a very close attention to calorie and nutritional information and selects the items that are low on calories but high on nutritional values.

The calories generally come from fats, sugar, and carbohydrate contents of the food, whereas the nutritional value mainly comes from the protein and vitamins. Information regarding the calorie contents and the nutritional values of the different items will be provided to you later in this booklet.

A dilemma that a health conscious shopper faces in deciding which item to buy is that the food with low calorie content does not necessarily provide the required nutritional value. Also, the food with high nutritional value does not always ensure low calories. Given this kind of a dilemma, you have decided that you can best serve your friend by carefully examining both the calorie content and the nutritional value of different items and selecting the item that gives the best possible combination of calorie and nutritional value.

However, if you find two items having the same or similarly attractive combinations of calorie and nutrition, you would select the more reputable brand.

### 2. SELECTION

Based upon the above criteria, you are required to select one can of vegetables from the six alternatives given later in this booklet. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selection you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (✓) against the item's name in the Selection Card.

### 3. TIME LIMIT

For this practice session, you will have Five Minutes to make your selection. You will be alerted when the time count begins.

If you have any questions, please stop here and ask. Otherwise, go on to the next page.

1. You have entered the "Canned Vegetables" section of the supermarket. Your time count of five minutes now begins.

2. Please look at the clock in front of you and write below the current time:

Hours   Minutes   Seconds

|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|

Please go to the next page.

**CANNED VEGETABLES**

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
<b>CUT BEETS</b>	Avondale	15	43¢	4	140	900
<b>JULIENNE CARROTS</b>	Avondale	17	85¢	5	120	960
<b>WHOLE-LEAF SPINACH</b>	Avondale	15	63¢	4	100	664
<b>MIXED VEGETABLES</b>	Avondale	17	45¢	5	140	840
<b>SWEET PEAS</b>	Avondale	17	83¢	5	280	1072
<b>CUT GREEN BEANS</b>	Avondale	20	65¢	7	140	720

(\*) A composite index of Protein and Vitamins contents.

1. To indicate your selection, check (✓) the item selected in the "Selection Card."
2. Please record the current time below as soon as you have checked the "Selection Card":

Hours	Minutes	Seconds

3. Do not turn this page; wait for the next instruction.

### ACTUAL SHOPPING TRIP

Your actual shopping trip is now going to begin. Before you start, please read the following carefully.

#### **1. PRODUCT CATEGORIES:**

You have agreed to purchase for your friend one item from each of the following six food product categories. The supermarket has these product categories arranged in the following order to control the normal traffic flow through the aisles. Therefore, the booklets are arranged in the following sequence and you will have to follow the same sequence while shopping.

1. Margarine
2. Pasta Dinner
3. Cold Breakfast Cereal
4. Canned Soup
5. Frozen Orange Juice (Canned)
6. Salad Dressing

#### **2. TIME LIMIT**

You will have 20 minutes for your entire shopping trip. You will be alerted when the time count begins.

#### **3. HOW TO MAKE A SELECTION**

The following instructions are similar to the one you received for the practice session. Nonetheless, please read them again.

Your friend is extremely conscious of her health and nutrition. She watches her weight carefully and performs regular work-outs. When it comes to buying food products, she is not concerned about their prices but she pays a very close attention to calorie and nutritional information and selects the items that are low on calories but high on nutritional values.

The calories generally come from fats, sugar, and carbohydrate contents of the food, whereas the nutritional value mainly comes from the protein and vitamins. Information regarding the calorie contents and the nutritional values of the different items will be provided to you later in the booklets.

A dilemma that a health conscious shopper faces in deciding which item to buy is that the food with low calorie content does not necessarily provide the required nutritional value. Also, the food with high nutritional value does not always ensure low calories. Given this kind of a dilemma, you have decided that you can best serve your friend by carefully examining both the calorie content and the nutritional value of different items and selecting the item that gives the best possible combination of calorie and nutritional value.

However, if you find two items having the same or similarly attractive combinations of calorie and nutrition, you would select the more reputable brand.

Please go on to the next page.

#### **4. SELECTION**

Based upon the above criteria, select one item from each of the six product categories. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selections you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (/) against the item's name in the Selection Card.

#### **5. AFTER THE SHOPPING TRIP**

Apart from making selections based on the above criteria, assume that after this shopping trip, you are going to visit another store where your friend normally goes for her grocery shopping. The only reason for your visiting this other store is to check if the prices at this store are more, less, or the same as the prices you paid for your purchases. To do that, you will have to remember the prices of the items that you are going to select because at the next store, the prices of the first store will not be available.

Given the above scenario, you should be prepared to do two things after completing your shopping trip. First, you should be prepared to explain to your friend that you have indeed followed her selection criteria described in "3" above while making the selections. Second, you should be in a position to remember the prices of the items you selected for her so that she can compare these prices herself against the prices she normally pays at her favorite store described above.

Please wait for the next instruction

BOOKLET NO. 1

MARGARINE

The time count of 20 minutes now begins. Before turning this page, please write below the current time:

Hours Minutes Seconds

|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|

Please go to the next page.

**MARGARINE**

Items	Manufacturer or Distributor	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
FLEISCHMANN'S LIGHT	Nabisco	18	99¢	33	2560	256
SHEDD'S SPREAD	Lever Brothers	15	35¢	31	2560	288
BLUE BONNET	Nabisco	17	65¢	32	3200	352
KROGER MARGARINE	Kroger	18	39¢	33	3400	382
PREMIUM MAZOLA	General Foods	18	95¢	33	3200	416
LAND O LAKES	Land O Lakes	17	69¢	32	3400	406

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

**PLEASE GO TO THE NEXT BOOKLET**

**BOOKLET NO. 2**

**PASTA DINNER**

**Before turning this page, please write below the current time:**

**Hours    Minutes    Seconds**

[    ] [    ] [    ]

**Please go to the next page**

**PASTA DINNER**

Items	Manufacturer	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
<b>DELUXE MACARONI CHEESE</b>	Kraft	8	\$1.13	4	1300	490
<b>EGG NOODLE WITH CHICKEN</b>	Kraft	8	\$1.23	4	760	432
<b>CREAMY PASTA</b>	Lipton	9	\$1.03	5	800	440
<b>VELVEETA SHELLS &amp; CHEESE</b>	Kraft	11	\$1.09	6	750	354
<b>CHEESE SUPREME</b>	Lipton	14	\$1.29	7	1080	540
<b>MACARONI &amp; CHEESE</b>	Kraft's	14	\$1.19	7	750	375

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

BOOKLET No. 3

COLD BREAKFAST CEREAL

Before turning this page, please write the current time below:

Hours   Minutes   Seconds

   |    |   

Please go to the next page.

**COLD BREAKFAST CEREAL**

Items	Brand	Net Weight Per Box (Ounce)	Price Per Box	Servings Per Box	Calories Per Box	Nutritional Value (*) Per Box
<b>RAISIN BRAN</b>	Kellogg's	20	\$1.93	20	120	452
<b>CORN FLAKES</b>	Kellogg's	18	\$1.73	18	165	480
<b>ALL-BRAN FRUIT AND ALMONDS</b>	Kellogg's	13	\$1.79	13	385	605
<b>RAISIN SQUARE</b>	Kellogg's	17	\$1.99	17	90	225
<b>JUST RIGHT</b>	Kellogg's	13	\$1.53	13	285	526
<b>FROSTED MINI-WHEATS</b>	Kellogg's	16	\$1.59	16	100	265

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET No. 4**

**CANNED SOUP**

**Before turning this page, please write the current time:**

**Hours    Minutes    Seconds**

**[   ] [   ] [   ]**

**Please go to the next page**

**CANNED SOUP**

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
<b>CURLY NOODLE WITH CHICKEN</b>	Campbell's	10	45¢	2.00	175	103
<b>CREAM OF ASPARAGUS</b>	Campbell's	12	55¢	2.75	248	67
<b>CHICKEN BROTH</b>	Campbell's	11	49¢	2.50	96	44
<b>CREAMY CHICKEN MUSHROOM</b>	Campbell's	10	59¢	2.00	200	185
<b>TOMATO BISQUE</b>	Campbell's	11	65¢	2.50	330	210
<b>CHUNCKY CHICKEN VEGETABLE</b>	Campbell's	11	69¢	1.00	240	200

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET No. 5**

**FROZEN ORANGE JUICE (CANNED)**

**Before turning this page, please write the current time:**

Hours      Minutes      Seconds

  |  |  |

**Please go to the next page**

**FROZEN ORANGE JUICE**

Items	Manufacturer or Distributor	Net Weight Per Can (Fl. Oz.)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
CITRUS HILL	Proctor & Gamble	12	95¢	8	720	1024
FLORIDA GOLD	Lykes Pasco	12	93¢	8	480	600
SUN GOLD	Pace Dairy	13	89¢	9	720	720
SENECA	Seneca Food	12	83¢	8	720	800
MINUTE MAID	Coca Cola	13	99¢	9	800	960
KROGER	Kroger	14	85¢	10	800	840

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

**PLEASE GO TO THE NEXT BOOKLET**

**BOOKLET No. 6**

**SALAD DRESSING**

**Before turning this page, please write the current time below:**

Hours    Minutes    Seconds

[\_\_\_\_] [\_\_\_\_] [\_\_\_\_]

**Please go to the next page**

**SALAD DRESSINGS**

Items	Brand	Net Weight Per Bottle (Fl.Oz.)	Price Per Bottle	Servings Per Bottle	Calories Per Bottle	Nutritional Value (*) Per Bottle
<b>CREAMY CUCUMBER</b>	Kraft	8.50	85¢	17	480	696
<b>ROCA BLUE</b>	Kraft	8.00	93¢	16	240	288
<b>CATALINA SPICY SWEET</b>	Kraft	9.00	89¢	18	240	320
<b>PRESTO ITALIAN</b>	Kraft	8.50	99¢	17	400	520
<b>THOUSAND ISLAND</b>	Kraft	8.00	83¢	16	480	672
<b>FRENCH</b>	Kraft	8.50	95¢	17	400	568

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT PAGE

**1. Please record the current time below as soon as you have checked the "Selection Card":**

Hours      Minutes      Seconds

**2. You have completed your shopping trip. Please wait for further instructions.**

**3. Please Do not talk with anyone.**

SELECTION CARD

Please check (/) only one item from each of the following product categories to indicate your selection:

**0. CANNED VEGETABLE**

- Cut Beets
- Julienne Carrots
- Whole-Leaf Spinach
- Mixed Vegetables
- Sweet Peas
- Cut Green Beans

**1. MARGARINE**

- Fleischmann's Light
- Shedd's Spread
- Blue Bonnet
- Kroger Margarine
- Premium Mazola
- Land O Lakes

**2. PASTA DINNER**

- Deluxe Macaroni & Cheese
- Egg Noodle with Chicken
- Creamy Pasta
- Velveeta Shells & Cheese
- Cheese Supreme
- Macaroni & Cheese

**3. COLD BREAKFAST CEREAL**

- Raisin Bran
- Corn Flakes
- All-Bran Fruit and Almonds
- Raisin Square
- Just Right
- Frosted Mini-Wheats

**4. CANNED SOUP**

- Curly Noodle with Chicken
- Cream of Asparagus
- Chicken Broth
- Creamy Chicken Mushroom
- Tomato Bisque
- Chunky Chicken Vegetable

**5. FROZEN ORANGE JUICE**

- Citrus Hill
- Florida Gold
- Sun Gold
- Seneca
- Minute Maid
- Kroger

**6. SALAD DRESSINGS**

- Creamy Cucumber
- Roca Blue
- Catalina Spicy Sweet
- Presto Italian
- Thousand Island
- French

## **Appendix C**

**Complete Experimental Procedure: Incidental  
Learning and Mixed Choice Task (Cell 21)**



THE R. B. PAMPLIN COLLEGE OF BUSINESS

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

*Blacksburg, Virginia 24061*

Thank you for agreeing to participate in this research. We hope, you will find it to be an interesting experience.

The purpose of this research is to investigate how grocery shoppers evaluate different alternatives in a supermarket and how they decide on a particular item to purchase. We propose to do this by developing a situation where you will take part in a grocery shopping trip. However, you will be asked to do the shopping for a friend whose shopping habits may or may not match with your own. That is, instead of employing your own criteria for selecting different items in the store, you will be asked to use the selection criteria that characterize the friend you are going to shop for.

You will be provided with six booklets, each representing a food product category, like canned soup, cold breakfast cereal, and so on. Within each product category, there will be six items. Your task would be to make one selection from each of the six product categories based upon some specific guidelines and instructions. After you have made all six selections, you will be asked to respond to a few questions about your purchase decisions.

To familiarize you with the selection procedures and the criteria your friend uses to make a selection, there will be a practice session and you will have the opportunity to ask any questions that you may have about the task at that time.

Remember, how you make your selections and how you respond to the questions in no way reflect your ability, talent, or actual shopping habits. Your responses will be kept strictly confidential. Do not write your name anywhere in the booklets or the questionnaire.

When you have completed all aspects of this shopping experience, the researcher will provide a more detailed explanation about this investigation.

### General Overview

In the accompanying packet, there are seven booklets arranged in a specific order, marked 0 through 6. Please do not change the order of the booklets.

Booklet No. 0 is to acquaint you with the instructions and to give you an opportunity to practice the selection tasks that you will be asked to perform in the subsequent booklets. After you have completed the task required in Booklet No. 0, you will be able to ask any question that you may have at that time. Once you are clear about the task instructions, we will proceed with the actual shopping trip beginning with Booklet No. 1, then Booklet No. 2, and so on, until you have completed with Booklet No. 6 in the order presented.

As mentioned before, each booklet represents a food product category found in a supermarket:

Booklet	Product Category
0	Canned Vegetables (For Practice)
1	Margarine
2	Pasta Dinner
3	Cold Breakfast Cereal
4	Canned Soup
5	Frozen Orange Juice (Canned)
6	Salad Dressing

Each product category will have six items. For example, in the category of Canned Vegetables, there will be: Cut Beets, Carrots, Whole-leaf Spinach, Mixed Vegetables, Sweet Peas, and Cut Green Beans.

At the beginning of the booklets, there will be a brief description of your friend and the criteria she normally uses when evaluating each item within a product category. Your task will be to use these criteria, and to select one item from the six alternatives in each product category. Please try to ignore your personal tastes and preferences to the extent possible and select the items that best match the selection criteria of your friend.

At various stages of your selection process, and filling out the questionnaire, you will be required to record the current time in the designated spaces. For this purpose, a clock is provided in front of you. Please make sure that all of you can see the readings in the clock clearly.

If you have any questions, please ask them now. Otherwise wait for the next instruction.

- 1. Please pick Booklet No. 0 marked "Practice Session" and set it in front of you.**
- 2. Please do not turn the page of Booklet No. 0 until instructed.**

BOOKLET NO. 0

PRACTICE SESSION

CANNED VEGETABLES

Assume that you are entering the "Canned Vegetables" section of a supermarket. Today, there are six items of canned vegetables available in the store. This booklet contains the necessary information that you will need to make your selection based on the following instructions.

### **1. HOW TO MAKE A SELECTION**

Your friend is an involved home-maker. She plans her menu, prepares a shopping list before shopping, and tries to stay within her shopping budget. When it comes to buying food products, she wants to buy the items that can provide adequate nutritional value to the members of her family and at the same time she is very careful about the prices she pays. She is not concerned about the calorie contents of different food items but she would buy the items that are high on nutritional values but low on price.

The nutritional value primarily comes from protein and vitamin contents of the food items. The information regarding the nutritional values and prices of the different food items will be provided to you later in this booklet.

A dilemma that a nutrition- and price-conscious shopper faces in deciding which item to buy is that the items with high nutritional values are not always available at acceptable prices. Conversely, the items with low prices do not always provide the desired nutrition. value. Given this kind of a dilemma, you have decided that you can best serve your friend by carefully examining both the prices and the nutritional values of different items and selecting the item that gives the best possible combination of price and nutritional value.

However, if you find two items having the same or similarly attractive combinations of price and nutritional value, you would select the more reputable brand.

### **2. SELECTION**

Based upon the above criteria, you are required to select one can of vegetables from the six alternatives given later in this booklet. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selection you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (✓) against the item's name in the Selection Card.

### **3. TIME LIMIT**

For this practice session, you will have Five Minutes to make your selection. You will be alerted when the time count begins.

If you have any questions, please stop here and ask. Otherwise, go on to the next page.

1. You have entered the "Canned Vegetables" section of the supermarket. Your time count of five minutes now begins.

2. Please look at the clock in front of you and write below the current time:

Hours Minutes Seconds

\_\_\_\_\_ | \_\_\_\_\_ | \_\_\_\_\_

Please go to the next page.

**CANNED VEGETABLES**

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
<b>CUT BEETS</b>	Avondale	15	43¢	4	140	900
<b>JULIENNE CARROTS</b>	Avondale	17	85¢	5	120	960
<b>WHOLE-LEAF SPINACH</b>	Avondale	15	63¢	4	100	664
<b>MIXED VEGETABLES</b>	Avondale	17	45¢	5	140	840
<b>SWEET PEAS</b>	Avondale	17	83¢	5	280	1072
<b>CUT GREEN BEANS</b>	Avondale	20	65¢	7	140	720

(\*) A composite index of Protein and Vitamins contents.

1. To indicate your selection, check (/) the item selected in the "Selection Card."
2. Please record the current time below as soon as you have checked the "Selection Card":

Hours	Minutes	Seconds

3. Do not turn this page; wait for the next instruction.

### ACTUAL SHOPPING TRIP

Your actual shopping trip is now going to begin. Before you start, please read the following carefully.

#### **1. PRODUCT CATEGORIES:**

You have agreed to purchase for your friend one item from each of the following six food product categories. The supermarket has these product categories arranged in the following order to control the normal traffic flow through the aisles. Therefore, the booklets are arranged in the following sequence and you will have to follow the same sequence while shopping.

1. Margarine
2. Pasta Dinner
3. Cold Breakfast Cereal
4. Canned Soup
5. Frozen Orange Juice (Canned)
6. Salad Dressing

#### **2. TIME LIMIT**

You will have 20 minutes for your entire shopping trip. You will be alerted when the time count begins.

#### **3. HOW TO MAKE A SELECTION**

The following instructions are similar to the one you received for the practice session. Nonetheless, please read them again.

Your friend is an involved home-maker. She plans her menu, prepares a shopping list before shopping, and tries to stay within her shopping budget. When it comes to buying food products, she wants to buy the items that can provide adequate nutritional value to the members of her family and at the same time she is very careful about the prices she pays. She is not concerned about the calorie contents of different food items but she would buy the items that are high on nutritional values but low on price.

The nutritional value primarily comes from protein and vitamin contents of the food items. The information regarding the nutritional values and prices of the different food items will be provided to you later in the booklets.

A dilemma that a nutrition- and price-conscious shopper faces in deciding which item to buy is that the items with high nutritional values are not always available at acceptable prices. Conversely, the items with low prices do not always provide the desired nutrition. Given this kind of a dilemma, you have decided that you can best serve your friend by carefully examining both the prices and the nutritional values of different items and selecting the item that gives the best possible combination of price and nutritional value.

However, if you find two items having the same or similarly attractive combinations of price and nutritional value, you would select the more reputable brand.

Please go on to the next page.

**4. SELECTION**

Based upon the above criteria, select one item from each of the six product categories. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selections you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (/) against the item's name in the Selection Card.

Please wait for the next instruction

**BOOKLET NO. 1**

**MARGARINE**

**The time count of 20 minutes now begins. Before turning this page, please write below the current time:**

**Hours   Minutes   Seconds**

**|\_\_\_\_\_| |\_\_\_\_\_| |\_\_\_\_\_|**

**Please go to the next page.**

**MARGARINE**

Items	Manufacturer or Distributor	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
FLEISCHMANN'S LIGHT	Nabisco	18	99¢	33	2560	256
SHEDD'S SPREAD	Lever Brothers	15	35¢	31	2560	288
BLUE BONNET	Nabisco	17	65¢	32	3200	352
KROGER MARGARINE	Kroger	18	39¢	33	3400	382
PREMIUM MAZOLA	General Foods	18	95¢	33	3200	416
LAND O LAKES	Land O Lakes	17	69¢	32	3400	406

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET NO. 2**

**PASTA DINNER**

**Before turning this page, please write below the current time:**

Hours      Minutes      Seconds

**Please go to the next page**

**PASTA DINNER**

Items	Manufacturer	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
<b>DELUXE MACARONI CHEESE</b>	Kraft	8	\$1.13	4	1300	490
<b>EGG NOODLE WITH CHICKEN</b>	Kraft	8	\$1.23	4	760	432
<b>CREAMY PASTA</b>	Lipton	9	\$1.03	5	800	440
<b>VELVEETA SHELLS &amp; CHEESE</b>	Kraft	11	\$1.09	6	750	354
<b>CHEESE SUPREME</b>	Lipton	14	\$1.29	7	1080	540
<b>MACARONI &amp; CHEESE</b>	Kraft's	14	\$1.19	7	750	375

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET No. 3**

**COLD BREAKFAST CEREAL**

**Before turning this page, please write the current time below:**

Hours   Minutes   Seconds

[      ] [      ] [      ]

**Please go to the next page.**

COLD BREAKFAST CEREAL

Items	Brand	Net Weight Per Box (Ounce)	Price Per Box	Servings Per Box	Calories Per Box	Nutritional Value (*) Per Box
RAISIN BRAN	Kellogg's	20	\$1.93	20	120	452
CORN FLAKES	Kellogg's	18	\$1.73	18	165	480
ALL-BRAN FRUIT AND ALMONDS	Kellogg's	13	\$1.79	13	385	605
RAISIN SQUARE	Kellogg's	17	\$1.99	17	90	225
JUST RIGHT	Kellogg's	13	\$1.53	13	285	526
FROSTED MINI-WHEATS	Kellogg's	16	\$1.59	16	100	265

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET No. 4**

**CANNED SOUP**

**Before turning this page, please write the current time:**

Hours    Minutes    Seconds

[    ] [    ] [    ]

**Please go to the next page**

**CANNED SOUP**

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
<b>CURLY NOODLE WITH CHICKEN</b>	Campbell's	10	45¢	2.00	175	103
<b>CREAM OF ASPARAGUS</b>	Campbell's	12	55¢	2.75	248	67
<b>CHICKEN BROTH</b>	Campbell's	11	49¢	2.50	96	44
<b>CREAMY CHICKEN MUSHROOM</b>	Campbell's	10	59¢	2.00	200	185
<b>TOMATO BISQUE</b>	Campbell's	11	65¢	2.50	330	210
<b>CHUNCKY CHICKEN VEGETABLE</b>	Campbell's	11	69¢	1.00	240	200

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET No. 5**

**FROZEN ORANGE JUICE (CANNED)**

**Before turning this page, please write the current time:**

Hours	Minutes	Seconds
<u>  </u>	<u>  </u>	<u>  </u>

**Please go to the next page**

FROZEN ORANGE JUICE

Items.	Manufacturer or Distributor	Net Weight Per Can (Fl. Oz.)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
CITRUS HILL	Proctor & Gamble	12	95¢	8	720	1024
FLORIDA GOLD	Lykes Pasco	12	93¢	8	480	600
SUN GOLD	Pace Dairy	13	89¢	9	720	720
SENECA	Seneca Food	12	83¢	8	720	800
MINUTE MAID	Coca Cola	13	99¢	9	800	960
KROGER	Kroger	14	85¢	10	800	840

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET No. 6**

**SALAD DRESSING**

**Before turning this page, please write the current time below:**

Hours    Minutes    Seconds

[    ] [    ] [    ]

**Please go to the next page**

**SALAD DRESSINGS**

Items	Brand	Net Weight Per Bottle (Fl.Oz.)	Price Per Bottle	Servings Per Bottle	Calories Per Bottle	Nutritional Value (*) Per Bottle
<b>CREAMY CUCUMBER</b>	Kraft	8.50	85¢	17	480	696
<b>ROCA BLUE</b>	Kraft	8.00	93¢	16	240	288
<b>CATALINA SPICY SWEET</b>	Kraft	9.00	89¢	18	240	320
<b>PRESTO ITALIAN</b>	Kraft	8.50	99¢	17	400	520
<b>THOUSAND ISLAND</b>	Kraft	8.00	83¢	16	480	672
<b>FRENCH</b>	Kraft	8.50	95¢	17	400	568

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT PAGE

**1. Please record the current time below as soon as you have checked the "Selection Card" :**

Hours      Minutes      Seconds

  |  |  |

**2. You have completed your shopping trip. Please wait for further instructions.**

**3. Please Do not talk with anyone.**

### SELECTION CARD

Please check (/) only one item from each of the following product categories to indicate your selection:

#### 0. CANNED VEGETABLE

- Cut Beets
- Julienne Carrots
- Whole-Leaf Spinach
- Mixed Vegetables
- Sweet Peas
- Cut Green Beans

#### 1. MARGARINE

- Fleischmann's Light
- Shedd's Spread
- Blue Bonnet
- Kroger Margarine
- Premium Mazola
- Land O Lakes

#### 3. COLD BREAKFAST CEREAL

- Raisin Bran
- Corn Flakes
- All-Bran Fruit and Almonds
- Raisin Square
- Just Right
- Frosted Mini-Wheats

#### 5. FROZEN ORANGE JUICE

- Citrus Hill
- Florida Gold
- Sun Gold
- Seneca
- Minute Maid
- Kroger

#### 2. PASTA DINNER

- Deluxe Macaroni & Cheese
- Egg Noodle with Chicken
- Creamy Pasta
- Velveeta Shells & Cheese
- Cheese Supreme
- Macaroni & Cheese

#### 4. CANNED SOUP

- Curly Noodle with Chicken
- Cream of Asparagus
- Chicken Broth
- Creamy Chicken Mushroom
- Tomato Bisque
- Chunky Chicken Vegetable

#### 6. SALAD DRESSINGS

- Creamy Cucumber
- Roca Blue
- Catalina Spicy Sweet
- Presto Italian
- Thousand Island
- French

**Appendix D**

**Complete Experimental Procedure: Intentional  
Learning and Mixed Choice Task (Cell 22)**



THE R. B. PAMPLIN COLLEGE OF BUSINESS

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

*Blacksburg, Virginia 24061*

Thank you for agreeing to participate in this research. We hope, you will find it to be an interesting experience.

The purpose of this research is to investigate how grocery shoppers evaluate different alternatives in a supermarket and how they decide on a particular item to purchase. We propose to do this by developing a situation where you will take part in a grocery shopping trip. However, you will be asked to do the shopping for a friend whose shopping habits may or may not match with your own. That is, instead of employing your own criteria for selecting different items in the store, you will be asked to use the selection criteria that characterize the friend you are going to shop for.

You will be provided with six booklets, each representing a food product category, like canned soup, cold breakfast cereal, and so on. Within each product category, there will be six items. Your task would be to make one selection from each of the six product categories based upon some specific guidelines and instructions. After you have made all six selections, you will be asked to respond to a few questions about your purchase decisions.

To familiarize you with the selection procedures and the criteria your friend uses to make a selection, there will be a practice session and you will have the opportunity to ask any questions that you may have about the task at that time.

Remember, how you make your selections and how you respond to the questions in no way reflect your ability, talent, or actual shopping habits. Your responses will be kept strictly confidential. Do not write your name anywhere in the booklets or the questionnaire.

When you have completed all aspects of this shopping experience, the researcher will provide a more detailed explanation about this investigation.

### General Overview

In the accompanying packet, there are seven booklets arranged in a specific order, marked 0 through 6. Please do not change the order of the booklets.

Booklet No. 0 is to acquaint you with the instructions and to give you an opportunity to practice the selection tasks that you will be asked to perform in the subsequent booklets. After you have completed the task required in Booklet No. 0, you will be able to ask any question that you may have at that time. Once you are clear about the task instructions, we will proceed with the actual shopping trip beginning with Booklet No. 1, then Booklet No. 2, and so on, until you have completed with Booklet No. 6 in the order presented.

As mentioned before, each booklet represents a food product category found in a supermarket:

Booklet	Product Category
0	Canned Vegetables (For Practice)
1	Margarine
2	Pasta Dinner
3	Cold Breakfast Cereal
4	Canned Soup
5	Frozen Orange Juice (Canned)
6	Salad Dressing

Each product category will have six items. For example, in the category of Canned Vegetables, there will be: Cut Beets, Carrots, Whole-leaf Spinach, Mixed Vegetables, Sweet Peas, and Cut Green Beans.

At the beginning of the booklets, there will be a brief description of your friend and the criteria she normally uses when evaluating each item within a product category. Your task will be to use these criteria, and to select one item from the six alternatives in each product category. Please try to ignore your personal tastes and preferences to the extent possible and select the items that best match the selection criteria of your friend.

At various stages of your selection process, and filling out the questionnaire, you will be required to record the current time in the designated spaces. For this purpose, a clock is provided in front of you. Please make sure that all of you can see the readings in the clock clearly.

If you have any questions, please ask them now. Otherwise wait for the next instruction.

**1. Please pick Booklet No. 0 marked "Practice Session" and set it in front of you.**

**2. Please do not turn the page of Booklet No. 0 until instructed.**

**BOOKLET NO. 0**

**PRACTICE SESSION**

**CANNED VEGETABLES**

Assume that you are entering the "Canned Vegetables" section of a supermarket. Today, there are six items of canned vegetables available in the store. This booklet contains the necessary information that you will need to make your selection based on the following instructions.

### **1. HOW TO MAKE A SELECTION**

Your friend is an involved home-maker. She plans her menu, prepares a shopping list before shopping, and tries to stay within her shopping budget. When it comes to buying food products, she wants to buy the items that can provide adequate nutritional value to the members of her family and at the same time she is very careful about the prices she pays. She is not concerned about the calorie contents of different food items but she would buy the items that are high on nutritional values but low on price.

The nutritional value primarily comes from protein and vitamin contents of the food items. The information regarding the nutritional values and prices of the different food items will be provided to you later in this booklet.

A dilemma that a nutrition- and price-conscious shopper faces in deciding which item to buy is that the items with high nutritional values are not always available at acceptable prices. Conversely, the items with low prices do not always provide the desired nutrition. Given this kind of a dilemma, you have decided that you can best serve your friend by carefully examining both the prices and the nutritional values of different items and selecting the item that gives the best possible combination of price and nutritional value.

However, if you find two items having the same or similarly attractive combinations of price and nutritional value, you would select the more reputable brand.

### **2. SELECTION**

Based upon the above criteria, you are required to select one can of vegetables from the six alternatives given later in this booklet. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selection you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (✓) against the item's name in the Selection Card.

### **3. TIME LIMIT**

For this practice session, you will have Five Minutes to make your selection. You will be alerted when the time count begins.

If you have any questions, please stop here and ask. Otherwise, go on to the next page.

1. You have entered the "Canned Vegetables" section of the supermarket. Your time count of five minutes now begins.

2. Please look at the clock in front of you and write below the current time:

Hours   Minutes   Seconds

[\_\_\_\_] [\_\_\_\_] [\_\_\_\_]

Please go to the next page.

**CANNED VEGETABLES**

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
<b>CUT BEETS</b>	Avondale	15	43¢	4	140	900
<b>JULIENNE CARROTS</b>	Avondale	17	85¢	5	120	960
<b>WHOLE-LEAF SPINACH</b>	Avondale	15	63¢	4	100	664
<b>MIXED VEGETABLES</b>	Avondale	17	45¢	5	140	840
<b>SWEET PEAS</b>	Avondale	17	83¢	5	280	1072
<b>CUT GREEN BEANS</b>	Avondale	20	65¢	7	140	720

(\*) A composite index of Protein and Vitamins contents.

1. To indicate your selection, check (/) the item selected in the "Selection Card."
2. Please record the current time below as soon as you have checked the "Selection Card":

Hours	Minutes	Seconds

3. Do not turn this page; wait for the next instruction.

### ACTUAL SHOPPING TRIP

Your actual shopping trip is now going to begin. Before you start, please read the following carefully.

#### **1. PRODUCT CATEGORIES:**

You have agreed to purchase for your friend one item from each of the following six food product categories. The supermarket has these product categories arranged in the following order to control the normal traffic flow through the aisles. Therefore, the booklets are arranged in the following sequence and you will have to follow the same sequence while shopping.

1. Margarine
2. Pasta Dinner
3. Cold Breakfast Cereal
4. Canned Soup
5. Frozen Orange Juice (Canned)
6. Salad Dressing

#### **2. TIME LIMIT**

You will have 20 minutes for your entire shopping trip. You will be alerted when the time count begins.

#### **3. HOW TO MAKE A SELECTION**

The following instructions are similar to the one you received for the practice session. Nonetheless, please read them again.

Your friend is an involved home-maker. She plans her menu, prepares a shopping list before shopping, and tries to stay within her shopping budget. When it comes to buying food products, she wants to buy the items that can provide adequate nutritional value to the members of her family and at the same time she is very careful about the prices she pays. She is not concerned about the calorie contents of different food items but she would buy the items that are high on nutritional values but low on price.

The nutritional value primarily comes from protein and vitamin contents of the food items. The information regarding the nutritional values and prices of the different food items will be provided to you later in the booklets.

A dilemma that a nutrition- and price-conscious shopper faces in deciding which item to buy is that the items with high nutritional values are not always available at acceptable prices. Conversely, the items with low prices do not always provide the desired nutrition. value. Given this kind of a dilemma, you have decided that you can best serve your friend by carefully examining both the prices and the nutritional values of different items and selecting the item that gives the best possible combination of price and nutritional value.

However, if you find two items having the same or similarly attractive combinations of price and nutritional value, you would select the more reputable brand.

Please go on to the next page.

#### **4. SELECTION**

Based upon the above criteria, select one item from each of the six product categories. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selections you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (/) against the item's name in the Selection Card.

#### **5. AFTER THE SHOPPING TRIP**

Apart from making selections based on the above criteria, assume that after this shopping trip, you are going to visit another store where your friend normally goes for her grocery shopping. The only reason for your visiting this other store is to check if the prices at this store are more, less, or the same as the prices you paid for your purchases. To do that, you will have to remember the prices of the items that you are going to select because at the next store, the prices of the first store will not be available.

Given the above scenario, you should be prepared to do two things after completing your shopping trip. First, you should be prepared to explain to your friend that you have indeed followed her selection criteria described in "3" above while making the selections. Second, you should be in a position to remember the prices of the items you selected for her so that she can compare these prices herself against the prices she normally pays at her favorite store described above.

Please wait for the next instruction

BOOKLET NO. 1

MARGARINE

The time count of 20 minutes now begins. Before turning this page, please write below the current time:

Hours Minutes Seconds

\_\_\_\_\_|\_\_\_\_\_||\_\_\_\_\_|

Please go to the next page.

**MARGARINE**

Items	Manufacturer or Distributor	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
<b>FLEISCHMANN'S LIGHT</b>	Nabisco	18	99¢	33	2560	256
<b>SHEDD'S SPREAD</b>	Lever Brothers	15	35¢	31	2560	288
<b>BLUE BONNET</b>	Nabisco	17	65¢	32	3200	352
<b>KROGER MARGARINE</b>	Kroger	18	39¢	33	3400	382
<b>PREMIUM MAZOLA</b>	General Foods	18	95¢	33	3200	416
<b>LAND O LAKES</b>	Land O Lakes	17	69¢	32	3400	406

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET NO. 2**

**PASTA DINNER**

**Before turning this page, please write below the current time:**

**Hours    Minutes    Seconds**

**[\_\_\_\_] [\_\_\_\_] [\_\_\_\_]**

**Please go to the next page**

**PASTA DINNER**

Items	Manufacturer	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
<b>DELUXE MACARONI CHEESE</b>	Kraft	8	\$1.13	4	1300	490
<b>EGG NOODLE WITH CHICKEN</b>	Kraft	8	\$1.23	4	760	432
<b>CREAMY PASTA</b>	Lipton	9	\$1.03	5	800	440
<b>VELVEETA SHELLS &amp; CHEESE</b>	Kraft	11	\$1.09	6	750	354
<b>CHEESE SUPREME</b>	Lipton	14	\$1.29	7	1080	540
<b>MACARONI &amp; CHEESE</b>	Kraft's	14	\$1.19	7	750	375

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

**PLEASE GO TO THE NEXT BOOKLET**

BOOKLET No. 3

COLD BREAKFAST CEREAL

Before turning this page, please write the current time below:

Hours   Minutes   Seconds

[    ] [    ] [    ]

Please go to the next page.

**COLD BREAKFAST CEREAL**

Items	Brand	Net Weight Per Box (Ounce)	Price Per Box	Servings Per Box	Calories Per Box	Nutritional Value (*) Per Box
<b>RAISIN BRAN</b>	Kellogg's	20	\$1.93	20	120	452
<b>CORN FLAKES</b>	Kellogg's	18	\$1.73	18	165	480
<b>ALL-BRAN FRUIT AND ALMONDS</b>	Kellogg's	13	\$1.79	13	385	605
<b>RAISIN SQUARE</b>	Kellogg's	17	\$1.99	17	90	225
<b>JUST RIGHT</b>	Kellogg's	13	\$1.53	13	285	526
<b>FROSTED MINI-WHEATS</b>	Kellogg's	16	\$1.59	16	100	265

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET No. 4**

**CANNED SOUP**

**Before turning this page, please write the current time:**

**Hours    Minutes    Seconds**

**[   ] [   ] [   ]**

**Please go to the next page**

**CANNED SOUP**

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
CURLY NOODLE WITH CHICKEN	Campbell's	10	45¢	2.00	175	103
CREAM OF ASPARAGUS	Campbell's	12	55¢	2.75	248	67
CHICKEN BROTH	Campbell's	11	49¢	2.50	96	44
CREAMY CHICKEN MUSHROOM	Campbell's	10	59¢	2.00	200	185
TOMATO BISQUE	Campbell's	11	65¢	2.50	330	210
CHUNCKY CHICKEN VEGETABLE	Campbell's	11	69¢	1.00	240	200

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

**PLEASE GO TO THE NEXT BOOKLET**

**BOOKLET No. 5**

**FROZEN ORANGE JUICE (CANNED)**

**Before turning this page, please write the current time:**

**Hours      Minutes      Seconds**

**[      ] [      ] [      ]**

**Please go to the next page**

FROZEN ORANGE JUICE

Items	Manufacturer or Distributor	Net Weight Per Can (Fl. Oz.)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
CITRUS HILL	Proctor & Gamble	12	95¢	8	720	1024
FLORIDA GOLD	Lykes Pasco	12	93¢	8	480	600
SUN GOLD	Pace Dairy	13	89¢	9	720	720
SENECA	Seneca Food	12	83¢	8	720	800
MINUTE MAID	Coca Cola	13	99¢	9	800	960
KROGER	Kroger	14	85¢	10	800	840

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET No. 6**

**SALAD DRESSING**

**Before turning this page, please write the current time below:**

**Hours      Minutes      Seconds**

**Please go to the next page**

**SALAD DRESSINGS**

Items	Brand	Net Weight Per Bottle (Fl.Oz.)	Price Per Bottle	Servings Per Bottle	Calories Per Bottle	Nutritional Value (*) Per Bottle
<b>CREAMY CUCUMBER</b>	Kraft	8.50	85¢	17	480	696
<b>ROCA BLUE</b>	Kraft	8.00	93¢	16	240	288
<b>CATALINA SPICY SWEET</b>	Kraft	9.00	89¢	18	240	320
<b>PRESTO ITALIAN</b>	Kraft	8.50	99¢	17	400	520
<b>THOUSAND ISLAND</b>	Kraft	8.00	83¢	16	480	672
<b>FRENCH</b>	Kraft	8.50	95¢	17	400	568

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT PAGE

**1. Please record the current time below as soon as you have checked the "Selection Card":**

Hours	Minutes	Seconds
<u>  </u>	<u>  </u>	<u>  </u>

**2. You have completed your shopping trip. Please wait for further instructions.**

**3. Please Do not talk with anyone.**

SELECTION CARD

Please check (/) only one item from each of the following product categories to indicate your selection:

0. CANNED VEGETABLE

- Cut Beets
- Julienne Carrots
- Whole-Leaf Spinach
- Mixed Vegetables
- Sweet Peas
- Cut Green Beans

1. MARGARINE

- Fleischmann's Light
- Shedd's Spread
- Blue Bonnet
- Kroger Margarine
- Premium Mazola
- Land O Lakes

2. PASTA DINNER

- Deluxe Macaroni & Cheese
- Egg Noodle with Chicken
- Creamy Pasta
- Velveeta Shells & Cheese
- Cheese Supreme
- Macaroni & Cheese

3. COLD BREAKFAST CEREAL

- Raisin Bran
- Corn Flakes
- All-Bran Fruit and Almonds
- Raisin Square
- Just Right
- Frosted Mini-Wheats

4. CANNED SOUP

- Curly Noodle with Chicken
- Cream of Asparagus
- Chicken Broth
- Creamy Chicken Mushroom
- Tomato Bisque
- Chunky Chicken Vegetable

5. FROZEN ORANGE JUICE

- Citrus Hill
- Florida Gold
- Sun Gold
- Seneca
- Minute Maid
- Kroger

6. SALAD DRESSINGS

- Creamy Cucumber
- Roca Blue
- Catalina Spicy Sweet
- Presto Italian
- Thousand Island
- French

## **Appendix E**

**Complete Experimental Procedure: Incidental  
Learning and Price-Based Choice Task (Cell 31)**



THE R. B. PAMPLIN COLLEGE OF BUSINESS

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

*Blacksburg, Virginia 24061*

Thank you for agreeing to participate in this research. We hope, you will find it to be an interesting experience.

The purpose of this research is to investigate how grocery shoppers evaluate different alternatives in a supermarket and how they decide on a particular item to purchase. We propose to do this by developing a situation where you will take part in a grocery shopping trip. However, you will be asked to do the shopping for a friend whose shopping habits may or may not match with your own. That is, instead of employing your own criteria for selecting different items in the store, you will be asked to use the selection criteria that characterize the friend you are going to shop for.

You will be provided with six booklets, each representing a food product category, like canned soup, cold breakfast cereal, and so on. Within each product category, there will be six items. Your task would be to make one selection from each of the six product categories based upon some specific guidelines and instructions. After you have made all six selections, you will be asked to respond to a few questions about your purchase decisions.

To familiarize you with the selection procedures and the criteria your friend uses to make a selection, there will be a practice session and you will have the opportunity to ask any questions that you may have about the task at that time.

Remember, how you make your selections and how you respond to the questions in no way reflect your ability, talent, or actual shopping habits. Your responses will be kept strictly confidential. Do not write your name anywhere in the booklets or the questionnaire.

When you have completed all aspects of this shopping experience, the researcher will provide a more detailed explanation about this investigation.

### General Overview

In the accompanying packet, there are seven booklets arranged in a specific order, marked 0 through 6. Please do not change the order of the booklets.

Booklet No. 0 is to acquaint you with the instructions and to give you an opportunity to practice the selection tasks that you will be asked to perform in the subsequent booklets. After you have completed the task required in Booklet No. 0, you will be able to ask any question that you may have at that time. Once you are clear about the task instructions, we will proceed with the actual shopping trip beginning with Booklet No. 1, then Booklet No. 2, and so on, until you have completed with Booklet No. 6 in the order presented.

As mentioned before, each booklet represents a food product category found in a supermarket:

Booklet	Product Category
0	Canned Vegetables (For Practice)
1	Margarine
2	Pasta Dinner
3	Cold Breakfast Cereal
4	Canned Soup
5	Frozen Orange Juice (Canned)
6	Salad Dressing

Each product category will have six items. For example, in the category of Canned Vegetables, there will be: Cut Beets, Carrots, Whole-leaf Spinach, Mixed Vegetables, Sweet Peas, and Cut Green Beans.

At the beginning of the booklets, there will be a brief description of your friend and the criteria she normally uses when evaluating each item within a product category. Your task will be to use these criteria, and to select one item from the six alternatives in each product category. Please try to ignore your personal tastes and preferences to the extent possible and select the items that best match the selection criteria of your friend.

At various stages of your selection process, and filling out the questionnaire, you will be required to record the current time in the designated spaces. For this purpose, a clock is provided in front of you. Please make sure that all of you can see the readings in the clock clearly.

If you have any questions, please ask them now. Otherwise wait for the next instruction.

- 1. Please pick Booklet No. 0 marked "Practice Session" and set it in front of you.**
- 2. Please do not turn the page of Booklet No. 0 until instructed.**

**BOOKLET NO. 0**

**PRACTICE SESSION**

**CANNED VEGETABLES**

Assume that you are entering the "Canned Vegetables" section of a supermarket. Today, there are six items of canned vegetables available in the store. This booklet contains the necessary information that you will need to make your selection based on the following instructions.

#### 1. HOW TO MAKE A SELECTION

Your friend is an extremely price-conscious shopper. She loves to shop around for bargains and selects stores because of the low prices they offer. She is not concerned about the calorie contents or the nutritional values of different food items, but she pays a very close attention to the prices of different items to find out how the items rank against each other in terms of their expensiveness. Such ranking helps her identify the items that fall within her acceptable price limit. However, she does not necessarily select the lowest-priced item because she is aware that the items may vary in terms of their contents, weights, and sizes.

Some stores provide on the shelves the unit prices (for example, price per ounce) which make the price comparison easier for such price-conscious shoppers. Unfortunately, the store you are now going to visit does not give you the unit price (price per ounce) information. This makes it difficult for you to carry out the kind of price comparison your friend expects you to do. Given this kind of a situation, you have decided that you can best serve your friend by carefully examining both the prices as well as the weights of different food items and selecting the item that provides the best possible combination of price and weight.

However, if you find two items having the same or similarly attractive combinations of price and weight, you would carefully consider the item or brand names and select the most reputable brand because your friend will perceive it to be a bargain.

#### 2. SELECTION

Based upon the above criteria, you are required to select one can of vegetables from the six alternatives given later in this booklet. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selection you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (/) against the item's name in the Selection Card.

#### 3. TIME LIMIT

For this practice session, you will have Five Minutes to make your selection. You will be alerted when the time count begins.

If you have any question, please stop here and ask. Otherwise, go on to the next page.

1. You have entered the "Canned Vegetables" section of the supermarket. Your time count of five minutes now begins.

2. Please look at the clock in front of you and write below the current time:

Hours   Minutes   Seconds

[      ] [      ] [      ]

Please go to the next page.

CANNED VEGETABLES

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
CUT BEETS	Avondale	15	43¢	4	140	900
JULIENNE CARROTS	Avondale	17	85¢	5	120	960
WHOLE-LEAF SPINACH	Avondale	15	63¢	4	100	664
MIXED VEGETABLES	Avondale	17	45¢	5	140	840
SWEET PEAS	Avondale	17	83¢	5	280	1072
CUT GREEN BEANS	Avondale	20	65¢	7	140	720

(\*) A composite index of Protein and Vitamins contents.

1. To indicate your selection, check (✓) the item selected in the "Selection Card."
2. Please record the current time below as soon as you have checked the "Selection Card":

Hours	Minutes	Seconds

3. Do not turn this page; wait for the next instruction.

### ACTUAL SHOPPING TRIP

Your actual shopping trip is now going to begin. Before you start, please read the following carefully.

#### 1. PRODUCT CATEGORIES:

You have agreed to purchase for your friend one item from each of the following six food product categories. The supermarket has these product categories arranged in the following order to control the normal traffic flow through the aisles. Therefore, the booklets are arranged in the following sequence and you will have to follow the same sequence while shopping.

1. Margarine
2. Pasta Dinner
3. Cold Breakfast Cereal
4. Canned Soup
5. Frozen Orange Juice (Canned)
6. Salad Dressing

#### 2. TIME LIMIT

You will have 20 minutes for your entire shopping trip. You will be alerted when the time count begins.

#### 3. HOW TO MAKE A SELECTION

The following instructions are similar to the one you received for the practice session. Nonetheless, please read them again.

Your friend is an extremely price-conscious shopper. She loves to shop around for bargains and selects stores because of the low prices they offer. She is not concerned about the calorie contents or the nutritional values of different food items, but she pays a very close attention to the prices of different items to find out how the items rank against each other in terms of their expensiveness. Such ranking helps her identify the items that fall within her acceptable price limit. However, she does not necessarily select the lowest-priced item because she is aware that the items may vary in terms of their contents, weights, and sizes.

Some stores provide on the shelves the unit prices (for example, price per ounce) which make the price comparison easier for such price-conscious shoppers. Unfortunately, the store you are now going to visit does not give you the unit price (price per ounce) information. This makes it difficult for you to carry out the kind of price comparison your friend expects you to do. Given this kind of a situation, you have decided that you can best serve your friend by carefully examining both the prices as well as the weights of different food items and selecting the item that provides the best possible combination of price and weight.

However, if you find two items having the same or similarly attractive combinations of price and weight, you would carefully consider the item or brand names and select the most reputable brand because your friend will perceive it to be a bargain.

Please go on to the next page.

#### **4. SELECTION**

Based upon the above criteria, select one item from each of the six product categories. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selections you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (✓) against the item's name in the Selection Card.

Please wait for the next instruction

BOOKLET NO. 1

MARGARINE

The time count of 20 minutes now begins. Before turning this page, please write below the current time:

Hours Minutes Seconds

\_\_\_\_\_|\_\_\_\_\_||\_\_\_\_\_|

Please go to the next page.

**MARGARINE**

Items	Manufacturer or Distributor	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
<b>FLEISCHMANN'S LIGHT</b>	Nabisco	18	99¢	33	2560	256
<b>SHEDD'S SPREAD</b>	Lever Brothers	15	35¢	31	2560	288
<b>BLUE BONNET</b>	Nabisco	17	65¢	32	3200	352
<b>KROGER MARGARINE</b>	Kroger	18	39¢	33	3400	382
<b>PREMIUM MAZOLA</b>	General Foods	18	95¢	33	3200	416
<b>LAND O LAKES</b>	Land O Lakes	17	69¢	32	3400	406

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

BOOKLET NO. 2

PASTA DINNER

Before turning this page, please write below the current time:

Hours    Minutes    Seconds

   |    |    |

Please go to the next page

**PASTA DINNER**

Items	Manufacturer	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
<b>DELUXE MACARONI CHEESE</b>	Kraft	8	\$1.13	4	1300	490
<b>EGG NOODLE WITH CHICKEN</b>	Kraft	8	\$1.23	4	760	432
<b>CREAMY PASTA</b>	Lipton	9	\$1.03	5	800	440
<b>VELVEETA SHELLS &amp; CHEESE</b>	Kraft	11	\$1.09	6	750	354
<b>CHEESE SUPREME</b>	Lipton	14	\$1.29	7	1080	540
<b>MACARONI &amp; CHEESE</b>	Kraft's	14	\$1.19	7	750	375

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

BOOKLET No. 3

COLD BREAKFAST CEREAL

Before turning this page, please write the current time below:

Hours   Minutes   Seconds

[       ] [       ] [       ]

Please go to the next page.

**COLD BREAKFAST CEREAL**

Items	Brand	Net Weight Per Box (Ounce)	Price Per Box	Servings Per Box	Calories Per Box	Nutritional Value (*) Per Box
<b>RAISIN BRAN</b>	Kellogg's	20	\$1.93	20	120	452
<b>CORN FLAKES</b>	Kellogg's	18	\$1.73	18	165	480
<b>ALL-BRAN FRUIT AND ALMONDS</b>	Kellogg's	13	\$1.79	13	385	605
<b>RAISIN SQUARE</b>	Kellogg's	17	\$1.99	17	90	225
<b>JUST RIGHT</b>	Kellogg's	13	\$1.53	13	285	526
<b>FROSTED MINI-WHEATS</b>	Kellogg's	16	\$1.59	16	100	265

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET No. 4**

**CANNED SOUP**

**Before turning this page, please write the current time:**

**Hours      Minutes      Seconds**

**|\_\_\_\_\_| |\_\_\_\_\_| |\_\_\_\_\_|**

**Please go to the next page**

**CANNED SOUP**

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
<b>CURLY NOODLE WITH CHICKEN</b>	Campbell's	10	45¢	2.00	175	103
<b>CREAM OF ASPARAGUS</b>	Campbell's	12	55¢	2.75	248	67
<b>CHICKEN BROTH</b>	Campbell's	11	49¢	2.50	96	44
<b>CREAMY CHICKEN MUSHROOM</b>	Campbell's	10	59¢	2.00	200	185
<b>TOMATO BISQUE</b>	Campbell's	11	65¢	2.50	330	210
<b>CHUNCKY CHICKEN VEGETABLE</b>	Campbell's	11	69¢	1.00	240	200

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

**PLEASE GO TO THE NEXT BOOKLET**

**BOOKLET No. 5**

**FROZEN ORANGE JUICE (CANNED)**

**Before turning this page, please write the current time:**

Hours      Minutes      Seconds

|\_\_\_\_\_| \_\_\_\_| \_\_\_\_|

**Please go to the next page**

**FROZEN ORANGE JUICE**

Items	Manufacturer or Distributor	Net Weight Per Can (Fl. Oz.)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
<b>CITRUS HILL</b>	Proctor & Gamble	12	95¢	8	720	1024
<b>FLORIDA GOLD</b>	Lykes Pasco	12	93¢	8	480	600
<b>SUN GOLD</b>	Pace Dairy	13	89¢	9	720	720
<b>SENECA</b>	Seneca Food	12	83¢	8	720	800
<b>MINUTE MAID</b>	Coca Cola	13	99¢	9	800	960
<b>KROGER</b>	Kroger	14	85¢	10	800	840

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

**PLEASE GO TO THE NEXT BOOKLET**

**BOOKLET No. 6**

**SALAD DRESSING**

**Before turning this page, please write the current time below:**

**Hours      Minutes      Seconds**

**[      ] [      ] [      ]**

**Please go to the next page**

**SALAD DRESSINGS**

Items	Brand	Net Weight Per Bottle (Fl.Oz.)	Price Per Bottle	Servings Per Bottle	Calories Per Bottle	Nutritional Value (*) Per Bottle
<b>CREAMY CUCUMBER</b>	Kraft	8.50	85¢	17	480	696
<b>ROCA BLUE</b>	Kraft	8.00	93¢	16	240	288
<b>CATALINA SPICY SWEET</b>	Kraft	9.00	89¢	18	240	320
<b>PRESTO ITALIAN</b>	Kraft	8.50	99¢	17	400	520
<b>THOUSAND ISLAND</b>	Kraft	8.00	83¢	16	480	672
<b>FRENCH</b>	Kraft	8.50	95¢	17	400	568

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT PAGE

**1. Please record the current time below as soon as you have checked the "Selection Card" :**

Hours      Minutes      Seconds

   |    |   

**2. You have completed your shopping trip. Please wait for further instructions.**

**3. Please Do not talk with anyone.**

### SELECTION CARD

Please check (/) only one item from each of the following product categories to indicate your selection:

#### 0. CANNED VEGETABLE

- Cut Beets
- Julienne Carrots
- Whole-Leaf Spinach
- Mixed Vegetables
- Sweet Peas
- Cut Green Beans

#### 1. MARGARINE

- Fleischmann's Light
- Shedd's Spread
- Blue Bonnet
- Kroger Margarine
- Premium Mazola
- Land O Lakes

#### 3. COLD BREAKFAST CEREAL

- Raisin Bran
- Corn Flakes
- All-Bran Fruit and Almonds
- Raisin Square
- Just Right
- Frosted Mini-Wheats

#### 5. FROZEN ORANGE JUICE

- Citrus Hill
- Florida Gold
- Sun Gold
- Seneca
- Minute Maid
- Kroger

#### 2. PASTA DINNER

- Deluxe Macaroni & Cheese
- Egg Noodle with Chicken
- Creamy Pasta
- Velveeta Shells & Cheese
- Cheese Supreme
- Macaroni & Cheese

#### 4. CANNED SOUP

- Curly Noodle with Chicken
- Cream of Asparagus
- Chicken Broth
- Creamy Chicken Mushroom
- Tomato Bisque
- Chunky Chicken Vegetable

#### 6. SALAD DRESSINGS

- Creamy Cucumber
- Roca Blue
- Catalina Spicy Sweet
- Presto Italian
- Thousand Island
- French

## **Appendix F**

**Complete Experimental Procedure: Intentional  
Learning and Price-Based Choice Task (Cell 32)**

THE R. B. PAMPLIN COLLEGE OF BUSINESS



## VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

*Blacksburg, Virginia 24061*

Thank you for agreeing to participate in this research. We hope, you will find it to be an interesting experience.

The purpose of this research is to investigate how grocery shoppers evaluate different alternatives in a supermarket and how they decide on a particular item to purchase. We propose to do this by developing a situation where you will take part in a grocery shopping trip. However, you will be asked to do the shopping for a friend whose shopping habits may or may not match with your own. That is, instead of employing your own criteria for selecting different items in the store, you will be asked to use the selection criteria that characterize the friend you are going to shop for.

You will be provided with six booklets, each representing a food product category, like canned soup, cold breakfast cereal, and so on. Within each product category, there will be six items. Your task would be to make one selection from each of the six product categories based upon some specific guidelines and instructions. After you have made all six selections, you will be asked to respond to a few questions about your purchase decisions.

To familiarize you with the selection procedures and the criteria your friend uses to make a selection, there will be a practice session and you will have the opportunity to ask any questions that you may have about the task at that time.

Remember, how you make your selections and how you respond to the questions in no way reflect your ability, talent, or actual shopping habits. Your responses will be kept strictly confidential. Do not write your name anywhere in the booklets or the questionnaire.

When you have completed all aspects of this shopping experience, the researcher will provide a more detailed explanation about this investigation.

### General Overview

In the accompanying packet, there are seven booklets arranged in a specific order, marked 0 through 6. Please do not change the order of the booklets.

Booklet No. 0 is to acquaint you with the instructions and to give you an opportunity to practice the selection tasks that you will be asked to perform in the subsequent booklets. After you have completed the task required in Booklet No. 0, you will be able to ask any question that you may have at that time. Once you are clear about the task instructions, we will proceed with the actual shopping trip beginning with Booklet No. 1, then Booklet No. 2, and so on, until you have completed with Booklet No. 6 in the order presented.

As mentioned before, each booklet represents a food product category found in a supermarket:

Booklet	Product Category
0	Canned Vegetables (For Practice)
1	Margarine
2	Pasta Dinner
3	Cold Breakfast Cereal
4	Canned Soup
5	Frozen Orange Juice (Canned)
6	Salad Dressing

Each product category will have six items. For example, in the category of Canned Vegetables, there will be: Cut Beets, Carrots, Whole-leaf Spinach, Mixed Vegetables, Sweet Peas, and Cut Green Beans.

At the beginning of the booklets, there will be a brief description of your friend and the criteria she normally uses when evaluating each item within a product category. Your task will be to use these criteria, and to select one item from the six alternatives in each product category. Please try to ignore your personal tastes and preferences to the extent possible and select the items that best match the selection criteria of your friend.

At various stages of your selection process, and filling out the questionnaire, you will be required to record the current time in the designated spaces. For this purpose, a clock is provided in front of you. Please make sure that all of you can see the readings in the clock clearly.

If you have any questions, please ask them now. Otherwise wait for the next instruction.

- 1. Please pick Booklet No. 0 marked "Practice Session" and set it in front of you.**
- 2. Please do not turn the page of Booklet No. 0 until instructed.**

BOOKLET NO. 0

PRACTICE SESSION

CANNED VEGETABLES

Assume that you are entering the "Canned Vegetables" section of a supermarket. Today, there are six items of canned vegetables available in the store. This booklet contains the necessary information that you will need to make your selection based on the following instructions.

### **1. HOW TO MAKE A SELECTION**

Your friend is an extremely price-conscious shopper. She loves to shop around for bargains and selects stores because of the low prices they offer. She is not concerned about the calorie contents or the nutritional values of different food items, but she pays a very close attention to the prices of different items to find out how the items rank against each other in terms of their expensiveness. Such ranking helps her identify the items that fall within her acceptable price limit. However, she does not necessarily select the lowest-priced item because she is aware that the items may vary in terms of their contents, weights, and sizes.

Some stores provide on the shelves the unit prices (for example, price per ounce) which make the price comparison easier for such price-conscious shoppers. Unfortunately, the store you are now going to visit does not give you the unit price (price per ounce) information. This makes it difficult for you to carry out the kind of price comparison your friend expects you to do. Given this kind of a situation, you have decided that you can best serve your friend by carefully examining both the prices as well as the weights of different food items and selecting the item that provides the best possible combination of price and weight.

However, if you find two items having the same or similarly attractive combinations of price and weight, you would carefully consider the item or brand names and select the most reputable brand because your friend will perceive it to be a bargain.

### **2. SELECTION**

Based upon the above criteria, you are required to select one can of vegetables from the six alternatives given later in this booklet. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selection you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (/) against the item's name in the Selection Card.

### **3. TIME LIMIT**

For this practice session, you will have Five Minutes to make your selection. You will be alerted when the time count begins.

If you have any question, please stop here and ask. Otherwise, go on to the next page.

1. You have entered the "Canned Vegetables" section of the supermarket. Your time count of five minutes now begins.

2. Please look at the clock in front of you and write below the current time:

Hours   Minutes   Seconds

|\_\_\_\_\_| \_\_\_\_| \_\_\_\_|

Please go to the next page.

**CANNED VEGETABLES**

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
<b>CUT BEETS</b>	Avondale	15	43¢	4	140	900
<b>JULIENNE CARROTS</b>	Avondale	17	85¢	5	120	960
<b>WHOLE-LEAF SPINACH</b>	Avondale	15	63¢	4	100	664
<b>MIXED VEGETABLES</b>	Avondale	17	45¢	5	140	840
<b>SWEET PEAS</b>	Avondale	17	83¢	5	280	1072
<b>CUT GREEN BEANS</b>	Avondale	20	65¢	7	140	720

(\*) A composite index of Protein and Vitamins contents.

1. To indicate your selection, check (✓) the item selected in the "Selection Card."
2. Please record the current time below as soon as you have checked the "Selection Card":

Hours	Minutes	Seconds

3. Do not turn this page; wait for the next instruction.

### ACTUAL SHOPPING TRIP

Your actual shopping trip is now going to begin. Before you start, please read the following carefully.

#### 1. PRODUCT CATEGORIES:

You have agreed to purchase for your friend one item from each of the following six food product categories. The supermarket has these product categories arranged in the following order to control the normal traffic flow through the aisles. Therefore, the booklets are arranged in the following sequence and you will have to follow the same sequence while shopping.

1. Margarine
2. Pasta Dinner
3. Cold Breakfast Cereal
4. Canned Soup
5. Frozen Orange Juice (Canned)
6. Salad Dressing

#### 2. TIME LIMIT

You will have 20 minutes for your entire shopping trip. You will be alerted when the time count begins.

#### 3. HOW TO MAKE A SELECTION

The following instructions are similar to the one you received for the practice session. Nonetheless, please read them again.

Your friend is an extremely price-conscious shopper. She loves to shop around for bargains and selects stores because of the low prices they offer. She is not concerned about the calorie contents or the nutritional values of different food items, but she pays a very close attention to the prices of different items to find out how the items rank against each other in terms of their expensiveness. Such ranking helps her identify the items that fall within her acceptable price limit. However, she does not necessarily select the lowest-priced item because she is aware that the items may vary in terms of their contents, weights, and sizes.

Some stores provide on the shelves the unit prices (for example, price per ounce) which make the price comparison easier for such price-conscious shoppers. Unfortunately, the store you are now going to visit does not give you the unit price (price per ounce) information. This makes it difficult for you to carry out the kind of price comparison your friend expects you to do. Given this kind of a situation, you have decided that you can best serve your friend by carefully examining both the prices as well as the weights of different food items and selecting the item that provides the best possible combination of price and weight.

However, if you find two items having the same or similarly attractive combinations of price and weight, you would carefully consider the item or brand names and select the most reputable brand because your friend will perceive it to be a bargain.

Please go on to the next page.

#### **4. SELECTION**

Based upon the above criteria, select one item from each of the six product categories. Again, please try to avoid using your own tastes and preferences as much as possible when making your selection. Also note that written calculations in the booklets are not permitted. Calculations, if necessary, will have to be carried out mentally.

To indicate the selections you make, you are provided with a "Selection Card" that has a list of all the grocery items. Please keep the Selection Card in front of you. As soon as you have made your decision as to which item to select, please check (✓) against the item's name in the Selection Card.

#### **5. AFTER THE SHOPPING TRIP**

Apart from making selections based on the above criteria, assume that after this shopping trip, you are going to visit another store where your friend normally goes for her grocery shopping. The only reason for your visiting this other store is to check if the prices at this store are more, less, or the same as the prices you paid for your purchases. To do that, you will have to remember the prices of the items that you are going to select because at the next store, the prices of the first store will not be available.

Given the above scenario, you should be prepared to do two things after completing your shopping trip. First, you should be prepared to explain to your friend that you have indeed followed her selection criteria described in "3" above while making the selections. Second, you should be in a position to remember the prices of the items you selected for her so that she can compare these prices herself against the prices she normally pays at her favorite store described above.

Please wait for the next instruction

**BOOKLET NO. 1**

**MARGARINE**

The time count of 20 minutes now begins. Before turning this page, please write below the current time:

Hours   Minutes   Seconds  
[\_\_\_\_\_| [\_\_\_\_\_| [\_\_\_\_\_|

Please go to the next page.

**MARGARINE**

Items	Manufacturer or Distributor	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
FLEISCHMANN'S LIGHT	Nabisco	18	99¢	33	2560	256
SHEDD'S SPREAD	Lever Brothers	15	35¢	31	2560	288
BLUE BONNET	Nabisco	17	65¢	32	3200	352
KROGER MARGARINE	Kroger	18	39¢	33	3400	382
PREMIUM MAZOLA	General Foods	18	95¢	33	3200	416
LAND O LAKES	Land O Lakes	17	69¢	32	3400	406

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (✓) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET NO. 2**

**PASTA DINNER**

**Before turning this page, please write below the current time:**

**Hours      Minutes      Seconds**

**[      ] [      ] [      ]**

**Please go to the next page**

PASTA DINNER

Items	Manufacturer	Net Weight Per Package (Ounce)	Price Per Package	Servings Per Package	Calories Per Package	Nutritional Value (*) Per Package
DELUXE MACARONI CHEESE	Kraft	8	\$1.13	4	1300	490
EGG NOODLE WITH CHICKEN	Kraft	8	\$1.23	4	760	432
CREAMY PASTA	Lipton	9	\$1.03	5	800	440
VELVEETA SHELLS & CHEESE	Kraft	11	\$1.09	6	750	354
CHEESE SUPREME	Lipton	14	\$1.29	7	1080	540
MACARONI & CHEESE	Kraft's	14	\$1.19	7	750	375

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET No. 3**

**COLD BREAKFAST CEREAL**

**Before turning this page, please write the current time below:**

**Hours   Minutes   Seconds**

   |    |   

**Please go to the next page.**

**COLD BREAKFAST CEREAL**

Items	Brand	Net Weight Per Box (Ounce)	Price Per Box	Servings Per Box	Calories Per Box	Nutritional Value (*) Per Box
<b>RAISIN BRAN</b>	Kellogg's	20	\$1.93	20	120	452
<b>CORN FLAKES</b>	Kellogg's	18	\$1.73	18	165	480
<b>ALL-BRAN FRUIT AND ALMONDS</b>	Kellogg's	13	\$1.79	13	385	605
<b>RAISIN SQUARE</b>	Kellogg's	17	\$1.99	17	90	225
<b>JUST RIGHT</b>	Kellogg's	13	\$1.53	13	285	526
<b>FROSTED MINI-WHEATS</b>	Kellogg's	16	\$1.59	16	100	265

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

**PLEASE GO TO THE NEXT BOOKLET**

BOOKLET No. 4

CANNED SOUP

Before turning this page, please write the current time:

Hours      Minutes      Seconds

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Please go to the next page

**CANNED SOUP**

Items	Brand	Net Weight Per Can (Ounce)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
<b>CURLY NOODLE WITH CHICKEN</b>	Campbell's	10	45¢	2.00	175	103
<b>CREAM OF ASPARAGUS</b>	Campbell's	12	55¢	2.75	248	67
<b>CHICKEN BROTH</b>	Campbell's	11	49¢	2.50	96	44
<b>CREAMY CHICKEN MUSHROOM</b>	Campbell's	10	59¢	2.00	200	185
<b>TOMATO BISQUE</b>	Campbell's	11	65¢	2.50	330	210
<b>CHUNCKY CHICKEN VEGETABLE</b>	Campbell's	11	69¢	1.00	240	200

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

**PLEASE GO TO THE NEXT BOOKLET**

**BOOKLET No. 5**

**FROZEN ORANGE JUICE (CANNED)**

**Before turning this page, please write the current time:**

Hours      Minutes      Seconds

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**Please go to the next page**

FROZEN ORANGE JUICE

Items	Manufacturer or Distributor	Net Weight Per Can (Fl. Oz.)	Price Per Can	Servings Per Can	Calories Per Can	Nutritional Value (*) Per Can
CITRUS HILL	Proctor & Gamble	12	95¢	8	720	1024
FLORIDA GOLD	Lykes Pasco	12	93¢	8	480	600
SUN GOLD	Pace Dairy	13	89¢	9	720	720
SENECA	Seneca Food	12	83¢	8	720	800
MINUTE MAID	Coca Cola	13	99¢	9	800	960
KROGER	Kroger	14	85¢	10	800	840

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT BOOKLET

**BOOKLET No. 6**

**SALAD DRESSING**

**Before turning this page, please write the current time below:**

**Hours      Minutes      Seconds**

   |    |   

**Please go to the next page**

**SALAD DRESSINGS**

Items	Brand	Net Weight Per Bottle (Fl.Oz.)	Price Per Bottle	Servings Per Bottle	Calories Per Bottle	Nutritional Value (*) Per Bottle
<b>CREAMY CUCUMBER</b>	Kraft	8.50	85¢	17	480	696
<b>ROCA BLUE</b>	Kraft	8.00	93¢	16	240	288
<b>CATALINA SPICY SWEET</b>	Kraft	9.00	89¢	18	240	320
<b>PRESTO ITALIAN</b>	Kraft	8.50	99¢	17	400	520
<b>THOUSAND ISLAND</b>	Kraft	8.00	83¢	16	480	672
<b>FRENCH</b>	Kraft	8.50	95¢	17	400	568

(\*) A composite index of Protein and Vitamins contents.

Please remember to check (/) the item selected in the "Selection Card."

PLEASE GO TO THE NEXT PAGE

**1. Please record the current time below as soon as you have checked the "Selection Card" :**

Hours	Minutes	Seconds

**2. You have completed your shopping trip. Please wait for further instructions.**

**3. Please Do not talk with anyone.**

### SELECTION CARD

Please check (/) only one item from each of the following product categories to indicate your selection:

#### 0. CANNED VEGETABLE

- Cut Beets
- Julienne Carrots
- Whole-Leaf Spinach
- Mixed Vegetables
- Sweet Peas
- Cut Green Beans

#### 1. MARGARINE

- Fleischmann's Light
- Shedd's Spread
- Blue Bonnet
- Kroger Margarine
- Premium Mazola
- Land O Lakes

#### 2. PASTA DINNER

- Deluxe Macaroni & Cheese
- Egg Noodle with Chicken
- Creamy Pasta
- Velveeta Shells & Cheese
- Cheese Supreme
- Macaroni & Cheese

#### 3. COLD BREAKFAST CEREAL

- Raisin Bran
- Corn Flakes
- All-Bran Fruit and Almonds
- Raisin Square
- Just Right
- Frosted Mini-Wheats

#### 4. CANNED SOUP

- Curly Noodle with Chicken
- Cream of Asparagus
- Chicken Broth
- Creamy Chicken Mushroom
- Tomato Bisque
- Chunky Chicken Vegetable

#### 5. FROZEN ORANGE JUICE

- Citrus Hill
- Florida Gold
- Sun Gold
- Seneca
- Minute Maid
- Kroger

#### 6. SALAD DRESSINGS

- Creamy Cucumber
- Roca Blue
- Catalina Spicy Sweet
- Presto Italian
- Thousand Island
- French

## **Appendix G**

**Complete Questionnaire and Memory Tests**

## **QUESTIONNAIRE**

This questionnaire asks you a few questions about the shopping trip you have just concluded. The questionnaire has four sections. Each section explains the nature of the information you are asked to provide. Please respond to the questions as carefully and as conscientiously as possible. Remember, your responses are in no way reflective of your talent, abilities, and shopping habits. Your responses will be kept completely confidential. **Do not write your name anywhere in the questionnaire.**

Please indicate your response by placing a cross (x) in the space that most correctly describes your responses.

Once you have completed a page, please **do not** go back to it after turning to the next page.

*Please Go To The Next Page*

### **Section I**

In the booklets, you were presented with seven different pieces of information about the items in each product category. You were also instructed to make your selections on the basis of a friend's selection criteria. This section tries to determine the extent to which you used the information provided.

- A. Please indicate the extent to which you used the following pieces of information during the selections. Please place a cross (x) in the appropriate space in each row below that best describes your response.

Never used the informa- tion	Moderately used the information	Always used the informa- tion		
1	2	3	4	5

1. NUTRITIONAL VALUES      |\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|

2. CALORIE CONTENTS      |\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|

3. NUMBER OF SERVINGS      |\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|

4. PRICES      |\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|

5. NET WEIGHTS      |\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|

6. MANUFACTURERS' OR  
DISTRIBUTORS' NAMES      |\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|

7. NAMES OF THE ITEMS      |\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|

B. Please indicate the extent you paid attention to the following pieces of information during the sections. Please place a cross (x) in the appropriate space in each row below that best describes your response.

Paid no attention to the information	Paid moderate attention to the information	Paid very close attention to the information		
1	2	3	4	5

1. NUTRITIONAL VALUES

2. CALORIE CONTENTS

3. NUMBER OF SERVINGS

4. PRICES

5. NET WEIGHTS

6. MANUFACTURERS' OR DISTRIBUTORS' NAMES

6. NAMES OF THE ITEMS

## **Section II**

This section assesses the extent to which you attempted to remember the prices of the items you selected.

- A. Please indicate the extent to which you agree with the statements below by placing a cross (x) in the appropriate spaces:

Completely Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Completely Agree
---------------------	-------------------	----------------------------	----------------	------------------

[\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_]

1. I tried to remember the prices of the items selected.

[\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_]

2. I did not make an attempt to remember the prices of the items selected.

[\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_]

3. I paid no attention to the prices of items I did not select.

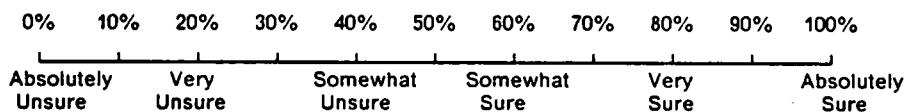
[\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_]

4. I knew that I would be asked to remember the prices of the items selected.

[\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_] [\_\_\_\_\_]

B. For some of the next set of questions, you may believe that the task asked of you is somewhat difficult, or perhaps unnecessary. However, each task is important, so please do the best you can. The reasons for asking you these questions will be explained when you complete the questionnaire.

While responding to some of the questions that follow, you may or may not be completely sure whether your responses are correct. To assess how sure you are, the following scale is provided:



If you are absolutely sure that your response is correct, write 100% in the appropriate spaces in the questionnaire. If you are absolutely unsure about the correctness of your response, write 0%. If your certainty level is somewhere in between these two extremes, write the number that best represents your level of surely.

Keep this page in front of you and use it whenever you have to indicate how sure you are about your responses.

If you have any question about the surety scale, please let me know. Otherwise, please go on to the next page.

C. The following questions relate to the PASTA DINNER you had selected.

1. Please go back to the "Shopping Cart" and write the name of the selected Pasta Dinner below.

\_\_\_\_\_

2. Please write the current time below:

Hours	Minutes	Seconds

3. Can you recall the price of the box of Pasta Dinner you selected? If yes, write the price below. If you cannot recall the price, give your best estimate. Please write only in one of the two spaces below. Do not write on both.

Recalled Price: \_\_\_\_\_; or Estimated Price: \_\_\_\_\_.

4. Using the scale given earlier, indicate how sure you are that the recalled or estimated price is correct.

Your level of surety that  
the recalled or estimated price  
in "3" above is correct

|\_\_\_\_\_| % Sure

5. Following are the names of the six items of Pasta Dinner that were presented to you in the booklet. Please do two things:

(1) Rank the items in terms of their prices per box (not price per ounce. That is, write "1" for the item you think had the lowest price per box, "2" for the next more expensive, and so on, and "6" for the item you think had the highest price per box of Pasta Dinner.

(2) Indicate the level of surely that each of your six ranking responses is correct by using the surely scale provided earlier.

Items	Expensiveness Ranks ("1" for The least expen- sive, "6" for the most expensive item)	Your level of surety that the response in the second column is correct
Deluxe Macaroni and cheese	_____	_____ % Sure
Egg Noodle with Chicken	_____	_____ % Sure
Creamy Pasta	_____	_____ % Sure
Velveeta Shells and Cheese	_____	_____ % Sure
Cheese Supreme	_____	_____ % Sure
Macaroni and Cheese	_____	_____ % Sure

6. Following are six prices for a box of Pasta Dinner. These six prices include the correct price of the box of pasta dinner you had selected. Please do the following:

(1) Identify the correct price of the box of pasta dinner you had selected and place a cross (x) in the corresponding "Yes" column. Then, go to the last column and indicate your level of surely that the price you have identified as correct is indeed the **correct** price.

Please remember that only **one** of the six prices is correct. Therefore, you should place no more than **one** cross (x) in the "Yes" column.

Prices	Place an "x" in the appropriate spaces to indicate your responses.	Your level of surety that each of your responses in the previous Yes or No columns is correct.
\$1.03	_____  Yes; No  _____	_____  % Sure
\$1.19	_____  Yes; No  _____	_____  % Sure
\$1.29	_____  Yes; No  _____	_____  % Sure
\$1.09	_____  Yes; No  _____	_____  % Sure
\$1.23	_____  Yes; No  _____	_____  % Sure
\$1.13	_____  Yes; No  _____	_____  % Sure

- (2) Place a cross (x) in the "No" column for each of the other five prices to indicate that these five prices are *not* the correct prices of the box of Pasta Dinner you had selected. Then, go to the last column and indicate how certain you are that **each** of these five prices are indeed the **incorrect** prices.

D. The following questions relate to the box of COLD BREAKFAST CEREAL you had selected.

1. Please go back to the "Selection Card" and write below the name of the selected Breakfast Cereal.

\_\_\_\_\_

2. Please write the current time below:

Hours	Minutes	Seconds

3. Can you recall the price of the box of Breakfast Cereal you selected? If yes, write the price below. If you cannot recall the price, give your best estimate. Please write only in one of the two spaces below. Do not write on both.

Recalled Price: \_\_\_\_\_; or Estimated Price: \_\_\_\_\_.

4. Using the scale given earlier, indicate how sure you are that the recalled or estimated price is correct.

Your level of surety that  
the recalled or estimated price  
in "3" above is correct

|\_\_\_\_\_| % Sure

5. Following are the names of the six items of Cold Breakfast Cereal that were presented to you in the booklet. Please do two things:

(1) Rank the items in terms of their prices per box (not price per ounce). That is, write "1" for the item you think had the lowest price per box, "2" for the next more expensive, and so on, and "6" for the item you think had the highest price per box of Cold Breakfast Cereal.

(2) Indicate the level of surety that each of your six ranking responses is correct by using the surety scale provided earlier.

Items	Expensiveness Ranks ("1" for The least expen- sive, "6" for the most expensive item)	Your level of surety that the response in the second column is correct
Raisin Bran	<input type="text"/>	<input type="text"/> % Sure
Corn Flakes	<input type="text"/>	<input type="text"/> % Sure
All-Bran Fruit and Almonds	<input type="text"/>	<input type="text"/> % Sure
Raisin Square	<input type="text"/>	<input type="text"/> % Sure
Just Right	<input type="text"/>	<input type="text"/> % Sure
Frosted Mini-Wheats	<input type="text"/>	<input type="text"/> % Sure

6. Following are six prices for a box of Cold Breakfast Cereal. These six prices include the correct price of the box of cereal you had selected. Please do the following:

(1) Identify the correct price of the box of cereal you had selected and place a cross (x) in the corresponding "Yes" column. Then, go to the last column and indicate your level of surely that the price you have identified as correct is indeed the **correct** price.

Please remember that only **one** of the six prices is correct. Therefore, you should place no more than **one** cross (x) in the "Yes" column.

Prices	Place an "x" in the appropriate spaces to indicate your responses.	Your level of surety that each of your responses in the previous Yes or No columns is correct.
\$1.59	_____  Yes; No  _____	_____  % Sure
\$1.73	_____  Yes; No  _____	_____  % Sure
\$1.99	_____  Yes; No  _____	_____  % Sure
\$1.79	_____  Yes; No  _____	_____  % Sure
\$1.53	_____  Yes; No  _____	_____  % Sure
\$1.93	_____  Yes; No  _____	_____  % Sure

- (2) Place a cross (x) in the "No" column for each of the other five prices to indicate that these five prices are *not* the correct prices of the box of cereal you had selected. Then, go to the last column and indicate how certain you are that **each** of these five prices are indeed the **incorrect** prices.

E. The following questions relate to the can of SOUP you had selected.

1. Please go back to the "Selection Card" and write below the name of the selected can of soup.

\_\_\_\_\_

2. Please write the current time below:

Hours	Minutes	Seconds

3. Can you recall the price of the can of soup you selected? If yes, write the price below. If you cannot recall the price, give your best estimate. Please write only in one of the two spaces below. Do not write on both.

Recalled Price: \_\_\_\_\_, or Estimated Price: \_\_\_\_\_.

4. Using the scale given earlier, indicate how sure you are that the recalled or estimated price is correct.

Your level of surety that  
the recalled or estimated price  
in "3" above is correct

| \_\_\_\_ | % Sure

5. Following are the names of the six items of canned soup that were presented to you in the booklet. Please do two things:

(1) Rank the items in terms of their prices per can (not price per ounce). That is, write "1" for the item you think had the lowest price per can, "2" for the next more expensive, and so on, and "6" for the item you think had the highest price per can of soup.

(2) Indicate the level of surety that each of your six ranking responses is correct by using the surety scale provided earlier.

Items	Expensiveness Ranks ("1" for The least expen- sive, "6" for the most expensive item)	Your level of surety that the response in the second column is correct
Curly Noodle with Chicken	____	____  % Sure
Cream of Asparagus	____	____  % Sure
Chicken Broth	____	____  % Sure
Creamy Chicken Mushroom	____	____  % Sure
Tomato Bisque	____	____  % Sure
Chunky Chicken Vegetable	____	____  % Sure

6. Following are six prices for a can of soup. These six prices include the correct price of the can of soup you had selected. Please do the following:

(1) Identify the correct price of the can of soup you had selected and place a cross (x) in the corresponding "Yes" column. Then, go to the last column and indicate your level of surety that the price you have identified as correct is indeed the **correct** price.

Please remember that only **one** of the six prices is correct. Therefore, you should place no more than **one** cross (x) in the "Yes" column.

Prices	Place an "x" in the appropriate spaces to indicate your responses.	Your level of surety that each of your responses in the previous Yes or No columns is correct.
69¢	_____   Yes; No   _____	_____   % Sure
65¢	_____   Yes; No   _____	_____   % Sure
59¢	_____   Yes; No   _____	_____   % Sure
49¢	_____   Yes; No   _____	_____   % Sure
55¢	_____   Yes; No   _____	_____   % Sure
45¢	_____   Yes; No   _____	_____   % Sure

- (2) Place a cross (x) in the "No" column for each of the other five prices to indicate that these five prices are **not** the correct prices of the can of soup you had selected. Then, go to the last column and indicate how certain you are that **each** of these five prices are indeed the **incorrect** prices.

F. The following questions relate to the can of FROZEN ORANGE JUICE you selected.

1. Please go back to the "Selection Card" and write below the name of the selected Orange Juice.

\_\_\_\_\_

2. Please write the current time below:

Hours	Minutes	Seconds

3. Can you recall the price of the can of frozen orange juice you selected? If yes, write the price below. If you cannot recall the price, give your best estimate. Please write only in one of the two spaces below. Do not write on both.

Recalled Price: \_\_\_\_\_; or Estimated Price: \_\_\_\_\_.

4. Using the scale given earlier, indicate how sure you are that the recalled or estimated price is correct.

Your level of surety that  
the recalled or estimated price  
in "3" above is correct.

|\_\_\_\_\_| % Sure

5. Following are the names of the six items of frozen orange juice that were presented to you in the booklet. Please do two things:

(1) Rank the items in terms of their prices per can (not price per fluid ounce). That is, write "1" for the item you think had the lowest price per can, "2" for the next more expensive, and so on, and "6" for the item you think had the highest price per can of frozen orange juice.

(2) Indicate the level of certainty that each of your six ranking responses is correct by using the surety scale provided earlier.

Items	Expensiveness Ranks ("1" for The least expen- sive, "6" for the most expensive item)	Your level of surety that the response in the second column is correct
Citrus Hill	<input type="text"/>	<input type="text"/> % Sure
Florida Gold	<input type="text"/>	<input type="text"/> % Sure
Sun Gold	<input type="text"/>	<input type="text"/> % Sure
Seneca	<input type="text"/>	<input type="text"/> % Sure
Minute Maid	<input type="text"/>	<input type="text"/> % Sure
Kroger	<input type="text"/>	<input type="text"/> % Sure

6. Following are six prices for a can of orange juice. These six prices include the correct price of the can of orange juice you selected. Please do the following:

(1) Identify the correct price of the can of orange juice you selected by placing a cross (x) in the corresponding "Yes" column. Then, go to the last column and indicate your level of surety that the price you have identified as correct is indeed the **correct** price.

Please remember that only **one** of the six prices is correct. Therefore, you should place no more than **one** cross (x) in the "Yes" column.

Prices	Place an "x" in the appropriate spaces below to indicate your responses.	Your level of surety that each of your responses in the previous Yes or No column is correct.
83¢	_____   Yes; No   _____	_____   % Sure
99¢	_____   Yes; No   _____	_____   % Sure
85¢	_____   Yes; No   _____	_____   % Sure
89¢	_____   Yes; No   _____	_____   % Sure
93¢	_____   Yes; No   _____	_____   % Sure
95¢	_____   Yes; No   _____	_____   % Sure

(2) Place a cross (x) in the "No" column for each of the other five prices to indicate that these five prices are **not** the correct prices for the can of orange juice you selected. Then, go to the last column and indicate how certain you are that **each** of these five prices is indeed the **incorrect** price.

7. Please write the current time below:

Hours	Minutes	Seconds

### **Section III**

- III. The following questions relate to your own grocery shopping habits. Please evaluate each of the following statements and indicate the extent to which you agree with them by placing a cross (x) in the appropriate spaces below:

Completely Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Completely Agree
---------------------	-------------------	----------------------------	----------------	------------------

_____	_____	_____	_____	_____
-------	-------	-------	-------	-------

1. **Grocery shopping is a very important task.** \_\_\_\_\_

_____	_____	_____	_____	_____
-------	-------	-------	-------	-------

2. **I enjoy doing my regular grocery shopping.** \_\_\_\_\_

_____	_____	_____	_____	_____
-------	-------	-------	-------	-------

3. **I select a store because of the low prices it offers.** \_\_\_\_\_

_____	_____	_____	_____	_____
-------	-------	-------	-------	-------

4. **Price is a very important factor when deciding which grocery items to buy.** \_\_\_\_\_

_____	_____	_____	_____	_____
-------	-------	-------	-------	-------

5. **I always check prices of different items before making a selection.** \_\_\_\_\_

_____	_____	_____	_____	_____
-------	-------	-------	-------	-------

6. **I always try to keep myself within a budget when I am grocery shopping.** \_\_\_\_\_

_____	_____	_____	_____	_____
-------	-------	-------	-------	-------

7. **I usually select store-brands because of their low prices.** \_\_\_\_\_

_____	_____	_____	_____	_____
-------	-------	-------	-------	-------

Completely Disagree	Somewhat Disagree	Neither Disagree nor Agree	Somewhat Agree	Completely Agree
------------------------	----------------------	-------------------------------------	-------------------	---------------------

---

8. Before going to the store, I check ads to find out what items are on sale.

---

9. A shopper can save a lot of money by shopping around for bargains.

---

10. The savings that you get by using coupons and by shopping for bargains is worth it.

---

11. I try to remember prices of different stores for deciding which store to visit for a given item.

---

12. I do not mind visiting several stores if I can get low prices.

---

13. I feel a sense of accomplishment if I can get a bargain price.

---

#### **Section IV**

**IV. Please respond to the following questions as accurately as possible. These responses will be kept completely confidential and will be used only to interpret the research results.**

1. Number of persons in your household: |\_\_\_\_\_|
2. Total number of earning members in your household: |\_\_\_\_\_|
3. Are you currently an earning member in your household? |\_\_\_\_\_| Yes |\_\_\_\_\_| No
4. Total income of your household. (Include incomes of all the members of your household):

Less than \$10,000	_____
Between \$10,000 and \$25,000	_____
Between \$25,000 and \$40,000	_____
Between \$40,000 and \$55,000	_____
Between \$55,000 and \$70,000	_____
Over \$70,000	_____

5. Approximate grocery bill of your household per month. \$ \_\_\_\_\_
6. Do you use an automobile for your grocery shopping? |\_\_\_\_\_| Yes |\_\_\_\_\_| No
7. Your Date of Birth \_\_\_\_\_
8. Are you currently married? |\_\_\_\_\_| Yes |\_\_\_\_\_| No

This is the end of the questionnaire. Thank you for your time and effort.

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the scanned document**