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**AN EXAMINATION OF HOW BUYERS
SUBJECTIVELY PERCEIVE AND EVALUATE
PRODUCT BUNDLES**

by

MANJIT S. YADAV

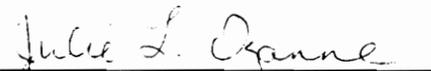
DISSERTATION submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY
in
GENERAL BUSINESS (MARKETING)

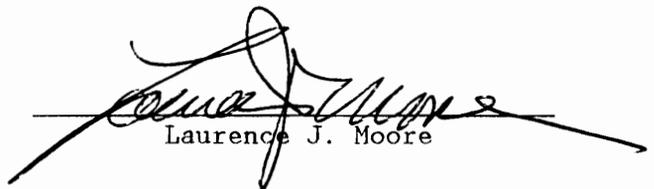
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(ABSTRACT)

This dissertation examines how buyers evaluate a bundle of items and how perceptions of savings are formed in the context of a bundle offer. Two conceptual models were developed and tested: 1) a model of the bundle's acquisition value, and 2) a model of the bundle's transaction value. Based on behavioral decision theory and recent developments in pricing research, the model of acquisition value focuses on the role of both price and non-price information. It is proposed that buyers use an anchoring and adjustment process to evaluate a bundle of items, evaluating the most important item first and then making incremental adjustments based on the evaluation of other items. The model of transaction value is based on the premise that buyers combine perceived savings on the individual items and perceived additional savings on the bundle to form their overall perception of savings in a bundle offer.

Two laboratory experiments were conducted using student subjects to test the proposed hypotheses. Experiment 1 tested the anchoring and adjustment hypothesis, while experiment 2 investigated the model of transaction value. A 3(bundle context) X 2(anchor context) between-subjects design was employed in the first experiment. The experimental factor

"bundle context" provided an opportunity to create evaluative scenarios in which subjects evaluated either only individual items or bundles with two or three items; "anchor context" manipulated the most important item in the bundles to be either excellent or poor. A computer-assisted data collection procedure was employed to obtain unobtrusive measures of the order in which subjects examined items in a bundle.

Results of the first experiment provided evidence consistent with the proposed anchoring and adjustment process: 1) subjects examined bundle items perceived as more important prior to those items that were perceived as less important, and 2) the overall evaluation of a bundle was a weighted average of the bundle items' evaluations. However, the hypothesis that the anchor item's evaluation may influence the evaluation of other bundle items was supported only for one of the four non-anchor items.

The second experiment manipulated savings on items and additional savings on a bundle in a 3X3 between-subjects design. Subjects examined an advertisement featuring two luggage items and then responded to items in a questionnaire. The hypothesis that buyers combine perceived savings on items and perceived additional savings on the bundle to form perceptions of overall savings in a bundle offer was supported. As hypothesized, the relative influence of perceived additional savings on the bundle was greater than the influence of perceived savings on the individual items. Although no hypotheses about interaction effects were proposed, there was evidence that perceived savings on items and perceived additional savings

on the bundle interact. Tests of the model using LISREL yielded further evidence supporting the proposed transaction value model.

DEDICATION

**This dissertation is dedicated
to my parents and
to the memory of my grandparents**

ACKNOWLEDGEMENTS

I first became interested in bundling during the summer of 1987 while working on an independent study under the guidance of Kent Monroe. In the three years since then, Kent has influenced not only the quality of this dissertation but also my own development as a researcher and educator. Over the years, he has generously contributed his time and effort to guide the completion of this dissertation. His love for working with students and his commitment to education was self evident, and I consider myself lucky to have worked under his guidance.

During the doctoral program, I worked as Noreen Klein's graduate assistant for almost two years. The training I received while working for her proved invaluable during the dissertation itself. I would like to thank Noreen for her patience; her willingness to sit through long meetings with me discussing alternative approaches to dissertation-related problems is greatly appreciated.

I would like express my appreciation to Ed Fern for sharing his ability to look at an issue from a completely different perspective. I found my meetings with him refreshing and enlightening--even when he shot down my favorite theories! Julie Ozanne too provided numerous insightful comments, and I would like to thank her for the contributions she made to the dissertation. I am also thankful to Larry Moore who frequently shared with me his observations about buying bundled products.

Wanda Belcher's word-processing expertise helped improve the overall quality of the typed document. Janice Blevins and Becky Stoddard too provided great help during various stages of the dissertation.

Finally, a word of thanks to my family. My wife Leslee has, with patience and love, shared the roller-coaster ups and downs of my doctoral studies. I would like to thank her for standing by me when I needed her the most. I also owe a word of thanks to my seven-year-old step-daughter, Dana, who at one point must have thought I had become a permanent fixture in my study. Hopefully, I may now be able to find more time to witness her cartwheels, and participate more patiently in a game of "Operation!"

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CHAPTER I

INTRODUCTION

RESEARCH PROBLEM

In 1963, Stigler analyzed a marketing practice called block booking. Using this practice to insure adequate distribution, film distributors would offer only an assortment of movies to the exhibitors. A-level movies would be offered only in combination with B-level movies and not individually. For example, Gone With the Wind and Getting Gertie's Garter would only be offered together as a block. Because it appeared that block booking was being used by film distributors to force distribution and showing of relatively mediocre or bad movies along with good ones, the courts struck down the practice. However, starting with Stigler's (1963) analysis, a large body of economics literature has sought to examine sellers' motivations for combining multiple products in single offers.

The focus of this dissertation is on a specific type of multiple product offers called bundling, defined as "the practice of marketing two or more products and/or services in a single 'package' for a special price" (Guiltinan 1987, p.74). The individual products may or may not be offered separately at their individual prices. A resort vacation package offering transportation, hotel stay, and meals at a single package price

illustrates the concept of bundling. Education packages offered by universities, entertainment packages sold by cable TV operators, and hardware and software packages available from computer companies are other examples of how this marketing strategy called bundling is practiced.

Previous research on bundling has focused primarily on its market-level consequences: seller profitability and welfare consequences. Bundling has been shown to enhance seller profitability by increasing the number of sales made at prices above marginal costs. Bundling has also been shown to result in a loss of consumer welfare as compared to unbundled sales. However, like many economic models, economic analyses pertaining to bundling are based on several simplifying assumptions about individual buyer behavior, seller behavior, and characteristics of the market. Because of the aggregate orientation of the economic analyses and the simplifying assumptions, the economic bundling models do not provide specific tools or guidelines for managerial use.

Instead of focusing on the aggregate market, the objective of this research is to examine how individual buyers form value perceptions about bundled offers. The economics literature on bundling makes several assumptions about individual buyer behavior. Hence, examining how buyers evaluate bundles may help test the validity of these assumptions. Furthermore, developing an understanding of buyer behavior in the context of bundled offers will assist firms' efforts to create value-enhanced and profitable bundle offers.

BUNDLING LITERATURE: INSIGHTS AND SHORTCOMINGS

Insights

Primarily, existing research on bundling is in the economics literature and examines bundling at the market level rather than at the level of individual buyers and sellers. This stream of research focuses on two questions: (1) Why do sellers bundle? and (2) what are the welfare implications of such a bundling strategy?

Regarding sellers' motivation to bundle, two primary arguments have been presented. Some researchers have reasoned that selling multiple products together may lead to production economies or a reduction in transaction costs. The arguments provided by Adams and Yellen (1976), however, suggest a second motivation. Bundling, they argued, enables the seller to segment the market into 1) buyers that purchase the bundle and 2) buyers that purchase only some of the individual bundle items. Although the complete argument will be presented later in Chapter II, their essential argument is that this type of segmenting by self-selection enhances profits by generating more sales from buyers in the second market segment.

The second question indicated above pertains to bundling's welfare implications. The general finding is that bundling complicates the traditional economic tools of welfare analysis. That is, the tools are not very effective in providing insights about welfare issues. Economic analyses indicate that bundling by a monopolist can lead to prices that are

higher than those that would prevail if bundling was not practiced. However, it has also been shown that prohibiting bundling activities by a monopolist firm will not always lead to increased consumer welfare.

Shortcomings

Previous economic analyses have examined the effects of bundling at the market level. Also, several simplifying assumptions have been made to permit analytical tractability. The assumption that the bundling firm is a monopoly, for example, is very restrictive and not appropriate in the context of a competitive environment (Guiltinan 1987). Another assumption is that the buyers' assessment of worth of the bundle is simply the sum of their assessments of worth of the individual bundle items. The importance of validating these assumptions was highlighted in a recent study that examined the effects of violating this assumption that the bundle is simply the sum of its items (Hanson and Martin 1987). Their analyses showed that violation of this assumption can lead to conclusions that differ substantially from those suggested by previous economic analyses. There is therefore a need to examine the validity of these assumptions. Also, from a marketing perspective, these analyses are inadequate in providing specific tools and guidelines for managerial use.

In summary, previous research on bundling has focused primarily on the aggregate market. Several simplifying assumptions have also been made. Because of the macro orientation of economic analyses, the individual buyer behavior remains unexplored. However, in order to create and

price product bundles, sellers need to understand how buyers subjectively perceive and evaluate bundles. In order to better understand the phenomenon, validate assumptions about buyer behavior, and to develop specific tools for managerial use, it is hence necessary to shift focus from the aggregate market to the behavior of individual buyers.

RESEARCH OBJECTIVES

There are three main objectives of this research effort: 1) develop a conceptualization of how price and non-price information presented in a bundle offer is examined and evaluated by buyers, 2) examine empirically the evaluation of non-price information, and 3) examine empirically the influence of alternative price formats on perceptions of savings in a bundle offer. In the second objective, price formats refer to the several alternative ways in which price information about the bundle items and the bundle can be provided to buyers.

OVERVIEW OF THE CONCEPTUALIZATION

Two conceptual models of bundle evaluation were developed in this research. Although details of these models are presented later, a broad overview of the influences they examine are shown in Figure 1. Three types of influences identified in this figure are: 1) influence of non-price information, 2) influence of the bundle price, and 3) influence of

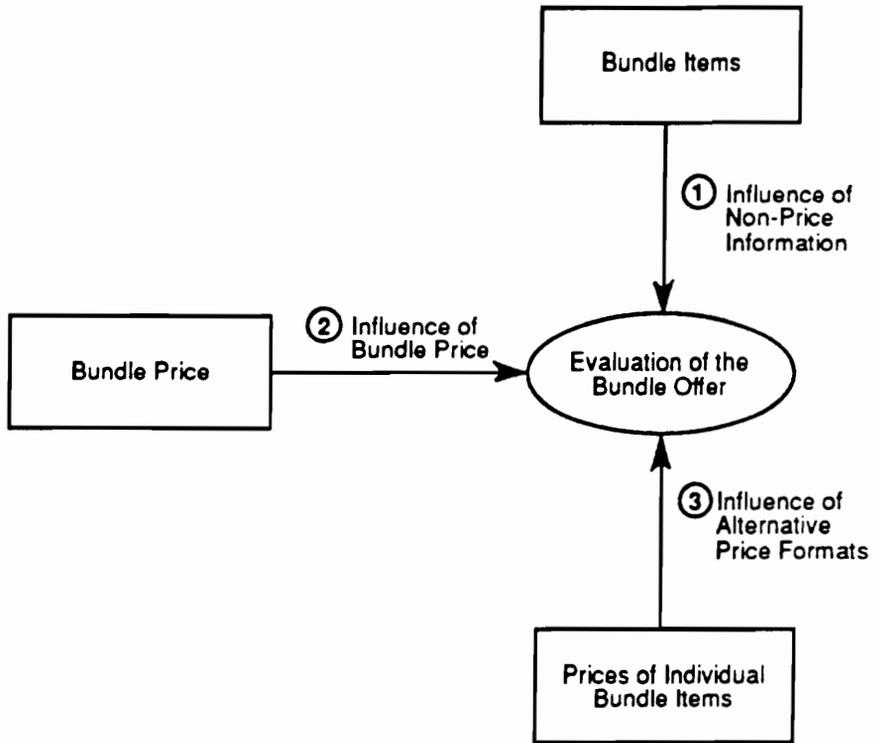


FIGURE 1. OVERVIEW OF INFLUENCES ON THE EVALUATION OF A BUNDLE OFFER

alternative price formats. As a preview of Chapter II, these influences are briefly described below.

Influence of Non-Price Information

It is a thesis of this dissertation that buyers make overall evaluations of a set of bundle items by using a judgment process called anchoring and adjustment (Tversky and Kahneman 1974). As a heuristic, anchoring and adjustment processes have been shown to be applicable in a variety of substantive areas: sales predictions, Bayesian updating tasks, product evaluations, and predicting preferences of spouses. In evaluative tasks, this heuristic entails anchoring on one assessment and then making adjustments to it. The choice of anchor is determined by perceived importance--subjects anchor on the bundle item that is perceived to be most important.

In evaluating a set of bundle items, the anchoring and adjustment thesis states that buyers will examine and evaluate the bundle items in a sequential fashion. Consistent with the choice of anchors in general, the most important bundle member will be attended to first. The evaluation made about this anchor then serves as a reference to evaluate other bundle items. When other bundle items are subsequently examined in this sequential evaluation process, adjustments are made to the anchor evaluation to form the overall bundle evaluation. The nature of these adjustments resembles an averaging process--that is, the bundle evaluation is a weighted average of the individual items' evaluations.

Influence of Bundle Price and Alternative Price Formats

In Figure 1, these two influences are labeled 2 and 3 respectively. In developing the influence of the bundle price on purchase-related perceptions, the dissertation's conceptualization draws on the large body of literature that examines such perceptions in the context of single-product offers (e.g., Grewal 1989; Monroe and Chapman 1987; Monroe and Krishnan 1985; Thaler 1985; Zeithaml 1988). Based on this body of literature, analogous arguments are developed for the case of bundle offers.

Regarding the influence of alternative price formats, the conceptualization posits that perceptions about the bundle price (e.g., perceived sacrifice, perceived savings) are typically made against a backdrop of price information about the bundle items. Based on Thaler's (1985) notions of segregation and integration of multiple gains, it is argued that perceptions of savings in a bundle offer are influenced by the following two perceptions: 1) perceived savings on the items, and 2) perceived savings on the bundle. A conceptual model integrating the role of these perceptions is presented later in Chapter II.

OVERVIEW OF THE RESEARCH METHODOLOGY

The objectives and conceptualization of this research suggested the need for more than one empirical investigation. It was eventually decided that two separate empirical studies would be adequate to examine the

relevant research issues. Specifically, two laboratory experiments were conducted in this research. These experiments are now briefly described.

Experiment 1

This experiment focused on the process details of the hypothesized anchoring and adjustment process. The objective of this experiment was to test empirically the theoretical contention that buyers examine and evaluate a bundle of products using an anchoring and adjustment process. A 3(bundle context) X 2(anchor context) between-subjects design was employed. To illustrate the nature of these two manipulated factors, consider a hypothetical bundle with three items A, B, and C such that A is the a priori anchor (i.e., the one perceived as most important in the bundle). The three levels of bundle context then characterize three types of evaluative situations: 1) evaluation of A, B, and C separately, 2) evaluation of the bundle A+B followed by the evaluation of item C, and 3) evaluation of the bundle A+B+C. The two levels of the factor anchor context (excellent and poor) represent bundle situations where the anchor (i.e., item A) is manipulated to be either excellent or poor.

The anchoring and adjustment hypothesis suggests that evaluation of subsequent bundle items will be averaged with the anchor evaluation. The experimental design briefly described above permits an empirical test of this averaging process. Because the anchoring and adjustment hypothesis is essentially a statement about process, a computer software called Ci2 (Sawtooth Software, Inc. 1987) was used in this experiment to obtain un-

obtrusive measures of the order in which bundle items were examined by subjects. Tests of the anchoring and adjustment hypothesis were based on analyses of both outcomes (i.e., overall bundle evaluations) and unobtrusive measures. Analysis of variance, regression, and multiple comparison procedures were employed in the analyses.

Experiment 2

This experiment focused on the influences of bundle price and alternative price formats (labeled 2 and 3 respectively in Figure 1) on purchase-related perceptions about the bundle. As indicated above, alternative price formats refer to the several alternative ways in which price information about the bundle items can be provided to buyers.

A 3(price reduction on individual bundle items) X 3(price reduction on the bundle) was employed in this experiment to create alternative price formats. These manipulations provided a basis for comparing alternative ways of presenting bundle offers, and to assess the relative impact of each approach. Analysis of variance, multiple comparison procedures, and causal modeling were used to empirically test the proposed conceptual model and the hypothesized relationships.

In summary, two laboratory experiments were conducted. Experiment 1 was designed to test the anchoring and adjustment hypotheses. This experiment used interactive computer software to obtain unobtrusive measures of the order in which bundle items were examined by subjects. Tests of hypotheses were based on analyses of both the outcomes (overall bundle

evaluations) and unobtrusive process measures. The second experiment focused on the effects of alternative price formats on perceptions of savings in a bundle offer.

SIGNIFICANCE OF THIS RESEARCH

Bundling, in its various forms, is a widely-practiced marketing strategy. The existing bundling literature has examined the phenomenon primarily from an aggregate perspective. Also, simplifying assumptions about the individual buyers, the firm, and the market have been made to enhance analytical tractability. These assumptions remain empirically untested though there is evidence that their violations may substantially change the theoretical conclusions. Given the aggregate nature of the economic analyses and the body of simplifying assumptions, the existing literature does not provide specific tools or techniques for managerial use.

To obtain further insights about bundling and to provide specific guidelines for managerial use, this dissertation shifts focus from the aggregate market level to the individual buyer. With this emphasis on understanding how buyers evaluate bundles, this research effort offers several substantive, conceptual, and methodological contributions (see Brinberg and McGrath 1985; also Ozanne, Fern, and Yadav 1989). In addition, results of this investigation should be of interest to firms that presently use or plan to use a bundling strategy.

Substantively, the phenomenon of bundling is closely scrutinized to identify the similarities and differences between several types of bundle offers. An examination of the types of bundle offers is essential before an assessment can be made about how widespread this marketing practice is. In analyzing this substantive domain of bundling, a comprehensive review of the economics and marketing literature is presented to explain why this marketing practice is used so frequently by sellers.

Conceptually, this dissertation develops two models of bundle evaluation. These models integrate ideas from the behavioral research on price perceptions and human judgment processes. Specifically, these models focus on the role of both non-price and price information in the evaluation of bundle offers. Regarding the processing of non-price information, the applicability of a judgment process called anchoring and adjustment is explored in the context of bundle offers. Given that very little is yet known about how buyers evaluate bundle offers, the conceptual models developed in this dissertation are much-needed efforts. Hopefully, results of this investigation and the agenda of unexplored issues identified in the two conceptual models will encourage more research in this important area of marketing.

From a methodological perspective, this dissertation explores (in experiment 1) the use of a computer-interactive procedure to obtain process details of how buyers evaluate bundles. Computer-based procedures, in general, hold much promise of studying individual-level processes. In the substantive context of bundle evaluation, it is hoped that the computer-based methodology used in this experiment will encourage

other researchers to apply similar techniques to other unexplored issues of bundling.

And, finally, this research may assist managers in making several operational bundling decisions such as: 1) Which items should and should not be bundled? 2) How should information about bundle items be presented to buyers? 3) How should the price of a bundle relate to the price of its items? Specific managerial recommendations based on this investigation will focus on questions of this nature.

OVERVIEW OF CHAPTER II

The next chapter formally defines bundling and identifies different variations of this marketing practice. A review and critical assessment of the existing literature on bundling is then presented. The chapter then shifts focus from the market-level analyses of bundling to the judgment processes buyers may use to examine and evaluate bundle offers. Relevant developments in the behavioral research on price perception and human judgment processes are then reviewed. Drawing on this review, two conceptual models of bundle evaluation are developed: 1) model of bundle's acquisition value, and 2) model of bundle's transaction value. Based on these models, several propositions are articulated.

OVERVIEW OF CHAPTER III

This chapter develops the methodology for empirically testing a part of the proposed conceptual model of bundle's acquisition value--namely, the anchoring and adjustment process. Conceptual arguments of the previous chapter are briefly reviewed and hypotheses tested in this research effort are developed. Results of pretesting and methodological details of experiment 1 are also presented.

OVERVIEW OF CHAPTER IV

Results of experiment 1 are discussed in this chapter. Tests of the anchoring and adjustment hypotheses are based on analyses of outcomes (overall bundle evaluation) and process measures (order in which bundle items are examined).

OVERVIEW OF CHAPTER V

This chapter presents the methodological details of experiment 2 which focused on testing the proposed model of bundle's transaction value. Results of pretests and their impact on operational details of the experiment are also discussed.

OVERVIEW OF CHAPTER VI

The focus of this chapter is on the results of experiment 2. Tests of the conceptual model and the hypothesized relationships are based on analysis of variance, multiple comparisons, and causal modeling.

OVERVIEW OF CHAPTER VII

The research effort presented in this dissertation is evaluated in this chapter from a broad substantive, conceptual, and methodological perspective. Experiments 1 and 2 are critiqued, and several directions for future research are identified.

CHAPTER II

LITERATURE REVIEW AND CONCEPTUAL DEVELOPMENT

OVERVIEW

As indicated in the first chapter, sellers may have a profit motive to make bundle offers. It is not surprising, therefore, that the current marketing environment is characterized by numerous instances of products being sold together in the form of package deals. The wide range of examples described earlier illustrate the fact that package selling (or "bundling" as it is referred to in the literature), is a frequently-used marketing strategy. Nagle (1984) points out that the "principle of bundling is ubiquitously applied in both consumer and industrial markets" (p. S18). Despite the obvious importance of this marketing strategy to sellers, very little is known about how buyers evaluate bundle offers. For example, Goldberg, Green, and Wind (1984) prefaced their study on bundle evaluation by stating that "little attention has been given to the empirical study of consumers' preferences for bundled versus unbundled offers" (p. S114).

In the context of bundle offers, some behavioral issues that have received inadequate research attention are:

- How is a bundle evaluated?

•How is the value of a bundle related to the perceived value of its items?

•How do the characteristics of a bundle's items influence the evaluation process?

•What role does price play in the evaluation and purchase decision process?

Many issues pertaining to bundling have been examined in great detail in the economics literature (cf. Adams and Yellen 1976; Burstein 1960; Paroush and Peles 1981; Schmalensee 1982, 1984; Stigler 1963). Some of these research efforts will be critiqued in this chapter. The primary motivation driving these economists has been to examine the welfare and policy implications of bundling. Furthermore, their analyses are usually directed at the market-level effects of bundling.

The substantive interests of marketers and consumer researchers, however, usually lie at the level of the individual consumer. This research takes the position that many insights into bundling can be obtained by focusing specifically on the processes used by buyers to evaluate bundle offers. The primary purpose of this research is to develop a theoretical account of how bundle offers are evaluated. Given that very little empirical work exists in this area (Goldberg, Green and Wind 1984), this research will aim at addressing some important questions and outline an agenda for future research efforts.

The literature review presented in this chapter is developed around two related objectives: 1) examine and critique insights obtained from the existing bundling literature; 2) identify those aspects of the con-

sumer behavior and decision research literature that could provide clues to 'buyers' processes in the context of bundle evaluation.

Consistent with these objectives this chapter is organized as follows. The chapter begins by defining bundling more formally and then reviews the existing bundling literature. A critical assessment of the literature is also presented. The chapter, at that point, takes a step beyond the existing literature and focuses more specifically on how buyers process information while evaluating bundle offers. In this context, research on decision making and consumer behavior is examined. Details of a judgment process called anchoring and adjustment are presented and a model of bundle evaluation based on this process is developed. Moving momentarily away from this model, issues related to the role of price in product evaluation are reviewed and finally integrated into the anchoring and adjustment model. Based on the resultant conceptual model, several propositions are articulated.

BUNDLING

Types of Bundling

Bundling can be defined as "the practice of marketing two or more products and/or services in a single "package" for a special price" (Guiltinan 1987, p. 74). A seller can implement a bundling strategy in several different ways. For example, consider two products A and B offered by a

seller. If the seller combines A and B and sells only this package, the selling practice is referred to as pure bundling. If, in addition to the package, A and B are also offered separately by the seller, the practice is termed mixed-joint bundling. If A is made available to the consumer at a reduced price if B is bought at its regular price, the strategy is called mixed-leader bundling (A and B being available separately at their individual regular prices too). Finally, if the seller decides not to bundle and sells A and B separately, the seller is said to implement a pure components strategy.

The initial distinction between (1) pure components strategy, (2) pure bundling, and (3) mixed bundling was provided by Adams and Yellen (1976). Guiltinan (1987) separated mixed bundling into the (1) mixed-joint and (2) mixed-leader cases. He also identified an additional type of bundling called add-on bundling. To clarify the differences between various types of bundling, some examples are provided below.

Consider a vacation package that includes the airfare (A) and hotel expenses (B). The types of bundling offers the seller can offer are:

Pure bundling: Only the complete package is made available by the seller. Individual items of the package (e.g., the airfare alone) are not offered separately.

Mixed-joint bundling: The complete package is made available by the seller. Individual items of the package are also offered separately.

Mixed-leader bundling: The airfare item of the package is made available at a reduced price if the hotel item is bought at its regular price. Individual bundle items (at regular prices) are also offered separately.

Add-on

bundling:

Offering a sight-seeing tour for an (attractive) additional price to those who purchase the complete vacation package.

Special Cases of Bundling

Pure, mixed, and add-on bundling are usually recognized as the three major types of package deals offered by sellers. However, some other terms are also frequently encountered in the literature on bundling. Some of these terms are briefly discussed in this section.

Full-line forcing refers to the practice where a seller insists that a buyer (usually a retailer) accept the entire product line (Burstein 1960). The term quality bundling is usually employed in situations where several grades of a commodity are mixed together in some proportion and sold in a blended form. One example of this practice is the trade in coffee beans where several grades of beans are mixed before sale.

In blind bundling, a seller offers one or more products to a buyer on the condition that the contracting process be completed and payment made before the buyer can fully examine the products. Although a practice such as this may appear quite unlikely, it has been observed to occur in environments where the seller has a monopolistic position. For example, De Beers, the London-based company which has long held a monopolistic grip on the diamond market, is known to sell uncut diamonds using a practice quite akin to blind bundling (Kenny and Klein 1983).

Variety bundling, as the name implies, entails the selling of an assorted collection of products in a single package. Packages of miniature

cereal boxes and packs of assorted yogurt flavors are two examples of such a selling practice. Finally, packaging, the practice of selling products in different container sizes, is also referred to in the existing literature as a special type of bundling.

Tie-in Sales. The literature on package selling makes several references to a practice in which a seller "ties" the sale of a secondary product X with the sale of a primary product Y. IBM, for example, required that buyers of IBM's punch card machines purchase punch cards only from IBM. Several other examples of this practice are also available. Heaton Peninsular Company sold shoemaking machinery only to buyers who agreed to purchase shoe buttons exclusively from Heaton Peninsular. A.B. Dick Company tied the sale of its mimeograph machinery with supplies such as paper, stencils, and ink. And finally, Morgan Envelop Company sold its bathroom tissue dispensers on the condition that customers buy only its brand of tissue.

Tying practices, such as the ones mentioned above, attracted a lot of legal attention after the Clayton Antitrust Act of 1914. In several important legal decisions, the courts ruled that explicit tie-in arrangements were in violation of the Clayton Act. The legal precedent established in those decisions continues to be accepted by the courts. Generally speaking, the courts have struck down almost all explicit tie-in arrangements. The only exceptions that have been permitted are tying contracts for service on technical products. In such situations, the seller has to establish that the tying contract is essential to maintain the product's performance and reputation (Nagle 1984).

Although explicit tie-ins have been deemed illegal, Nagle (1984) points out that numerous opportunities exist for implicit tie-in arrangements. Food at theaters or amusement parks, replacement parts and maintenance for automobiles, blades for razors, and films for cameras are a few examples of such implicit tie-in opportunities.

Rationale for Bundling

Given that bundling practices are used so widely, it is natural to inquire into the reasons that may prompt sellers to adopt a bundling strategy. In fact, a large body of the economics literature on bundling focuses on issues related to seller motivation. Some of these motivations are now discussed.

Cost Argument

Sellers. Sellers may sometimes bundle products to take advantage of the resultant efficiencies in production and packaging. Consider, for example, the cost structure of banking institutions. The cost structure is usually characterized by a large fixed-cost component (e.g., computer expenses, rent, and utilities) and a relatively small variable cost component. Hence the incremental cost of providing additional financial services to a customer is quite low. For example, a customer with a checking account can be provided a savings account at a relatively small

incremental cost. Because this incremental cost is often less than the additional revenue generated by the second service, banks have an incentive to offer multiple-service packages to their potential customers (Guiltinan 1987). An analogous argument applies to other organizations with a cost structure characterized by high fixed costs and low variable costs (e.g., health clubs, vacation resorts, telephone companies).

Buyers. Another argument that is sometimes made to explain the prevalence of bundling practices focuses on the buyers. According to this argument, buyers may prefer bundle offers because they result in substantial savings in transaction costs. Consider, for example, the emerging popularity of one-stop service stations that offer services such as oil change, filter replacements, and car vacuuming in a single package. Their popularity may be explained by arguing that buyers value the convenience (low transaction cost) of purchasing these related services at the same place and at the same time.

Sellers and Buyers. Kohli and Park (1987) have shown that in some situations, both the buyer and seller can benefit from a bundling strategy. The authors modeled a situation where one manufacturer sells his products to another business. In their model, the manufacturer has the option of selling his multiple products either individually or in bundles of varying sizes. The authors found that bundle transactions (as compared to individual-product transactions) led to an increase in total economic gain, where

Total economic gain = S + B,
S = increase in the seller's profit, and
B = decrease in buyer's costs

The analytical framework assumed constant lead time, and modeled stock-out, inventory, and transportation costs.

Dealing with Market Heterogeneity

The literature on bundling suggests that sellers may bundle products in order to deal with heterogeneity (of consumer preferences) in the market place. The notion that heterogeneity exists on both the demand and supply sides of a market was articulated years ago by Alderson (1958). On the supply side, this heterogeneity is represented by the disaggregate form in which raw materials are available to the firms. Heterogeneity in demand is reflected in the diverse needs, tastes, and preferences that exist in most markets. Marketing, according to Alderson, is primarily concerned with appropriately transforming the heterogeneous supply to match the heterogeneous needs and preferences of consumers. Firms accomplish this by creating "an assortment of goods in the hands of the ultimate consumer." (Alderson 1958, p. 25).

An important variable on which consumers in a market can differ is reservation price, defined as the maximum price one is willing to pay for a product. A seller can increase his revenues by ensuring that, on an average, most consumers pay a price that is as close as possible to their respective reservation prices. As shown below, a bundling strategy ena-

bles a seller to accomplish that objective--namely, pricing as close as possible to the consumers' reservation prices.

Consider a hypothetical market in which there are two distinct segments (e.g., A and B) of consumers. Assume that the segments differ substantially in the maximum price they are willing to pay for a seller's product (i.e., segments differ in terms of their average reservation prices). Assume further that consumers in segment A are willing to pay \$15, whereas segment B consumers would not pay more than \$8. Ideally, the seller would want to price his product such that consumers in segment A paid \$15 and segment B consumers paid \$8. A selling practice such as this would be termed price discrimination as different consumers are being charged different prices for the same product. Even if the Robinson-Patman Act (which prohibits many types of price discrimination) was not violated, the seller will often be unable to implement a price discrimination strategy because 1) it is not feasible or practical to charge different prices, 2) reservation prices cannot be determined accurately, or 3) consumer segments are not clearly defined. The arguments developed below show that by employing a bundling strategy, a seller can effectively counter these impediments to price discrimination.

Bundling as Price Discrimination

When it is not feasible or practical to charge different prices to different consumers, a bundling strategy can serve as a form of price discrimination. This price discrimination explanation, first proposed by

Stigler (1963), pertained to a marketing strategy prevalent at that time in which film distributors would offer only a block of movies to the television stations. The stations were not given the option to select individual films of their choice. For example, when offered a block of films (e.g., X, Y, and Z), a TV station was not allowed to pick and choose from this block; only the complete block could be either accepted or rejected.

Eventually, this marketing strategy was declared illegal by the courts. The legal argument was that the marketing strategy was being used by film distributors to push mediocre films along with good ones. By forcing TV stations to accept Gone With the Wind and Getting Gertie's Garter, in the court's opinion, the distributors were attempting to ensure the distribution and showing of the second film.

Stigler found this legal argument inadequate and showed that the bundling strategy adopted by film distributors was in fact a form of price discrimination. He also demonstrated that, compared to selling individual films, a bundling strategy was more profitable.

To illustrate his price discrimination argument, Stigler considered two buyers (A,B) for two films (Gone With the Wind and Getting Gertie's Garter). The following reservation prices were assumed:

	Gone With the Wind	Getting Gertie's Garter	Total
Buyer A	\$8,000	\$2,500	\$10,500
Buyer B	\$7,000	\$3,000	\$10,000

With this reservation price structure, the seller could price Gone With the Wind at \$7,000 and Getting Gertie's Garter at \$2,500 to ensure

that both buyers A and B purchased the films.¹ The total revenue from an unbundle strategy such as this would be: $2(7000) + 2(2,500) = \$19,000$.

Now suppose that the film distributor adopts a bundling strategy and offers the two films together as a block. Based on the reservation prices shown above, buyer A is willing to pay $\$8,000 + \$2,500 = \$10,500$ for the two films. Similarly, buyer B would pay $\$7,000 + \$3,000 = \$10,000$. Hence, if the film distributor offered the block of films (on a take-it or leave-it basis) to the buyers for $\$10,000$, both A and B would purchase the block. The total revenue, with this bundling strategy, would be $\$10,000 + \$10,000 = \$20,000$, compared to $\$19,000$ obtained from an unbundle strategy.

Hence, selling the films as a block increases profit. But how is this a form of price discrimination? As both buyers A and B are paying $\$10,000$ each for a block of two films, price discrimination is apparently not present. To demonstrate the price discrimination, consider the implicit prices paid by buyers A and B for each of the two films:

	Gone With the Wind	Getting Gertie's Garter	Total
Buyer A	\$8,000	\$2,000	\$10,000
Buyer B	\$7,000	\$3,000	\$10,000

¹ Note that whereas buyer A values Gone with the Wind more ($\$8,000 > \$7,000$), buyer B is willing to pay more than A for Getting Gertie's Garter ($\$3,000 > \$2,500$). Stigler showed that preference reversals such as this were necessary for a bundling strategy to be profitable. However, Schmalensee (1984) later showed that type of preference structure was strictly neither a necessary nor a sufficient condition for bundling to be profitable. Schmalensee's analysis is discussed later in this chapter.

Comparing these prices with the reservation prices shown earlier, it can be seen that buyer A pays a price equal to his reservation price for Gone With the Wind. However, he pays \$500 less than his reservation price for Getting Gertie's Garter. Buyer B, on the other hand, pays his reservation price for each of the two films. An examination of the actual prices paid will indicate that, though each buyer pays \$10,000 for the block of films, the implicit prices paid for individual films are different; buyer A pays \$1,000 more than B for Gone With the Wind, whereas B's implicit price for Getting Gertie's Garter exceeds A's by \$1,000. Because these differences in implicit prices are not readily apparent, Stigler argued that the film distributors' bundling strategy was a disguised form of price discrimination.

Bundling as a Metering Device

This section demonstrates that a type of bundling practice, tie-in sales, is also a disguised form of price discrimination. It will be shown that, by using tie-in sales, a seller can identify heavy users from light users, and charge a higher price from those who value the seller's product more (usually the heavy users). Because this selling practice enables the seller to discriminate on the basis of usage rate, the economics literature sometimes refers to it as a metering device. In tie-in sales, as indicated earlier, a seller "ties" the sale of a secondary product with a primary product. In many of the tie-in sales that were eventually declared illegal by the courts, the secondary products was a supply (e.g.,

punch cards) that was used with the primary product (e.g., punch card machines).

To obtain insights into the price discrimination, consider a machine (product A) that uses a supply (product B) for its functioning. Because of the diversity in usage rates, there will be some heavy users and some light users. It is reasonable to expect that heavy users will value the machine A more (i.e., their reservation price will be greater). To show that heavy users pay a higher effective price than the light users when they purchase tied-in products, consider two users, 1 and 2. Let user 1 be the heavy user and 2 the light user. The following nomenclature is also necessary:

P_B = price per unit of supply B
 n_1 = number of units of B consumed by heavy user 1 in time T
 n_2 = number of units of B consumed by light user 2 in time T
 P_A = price charged for machine A

Each user has to pay P_B for each additional unit of supply B. As supply B is essential for the functioning of the primary product A, the heavy user 2 will consume more quantities of B. In the same time period T, users 1 and 2 pay the following amounts:

User 1 (heavy): $P_A + n_1 P_B$
User 2 (light): $P_A + n_2 P_B$

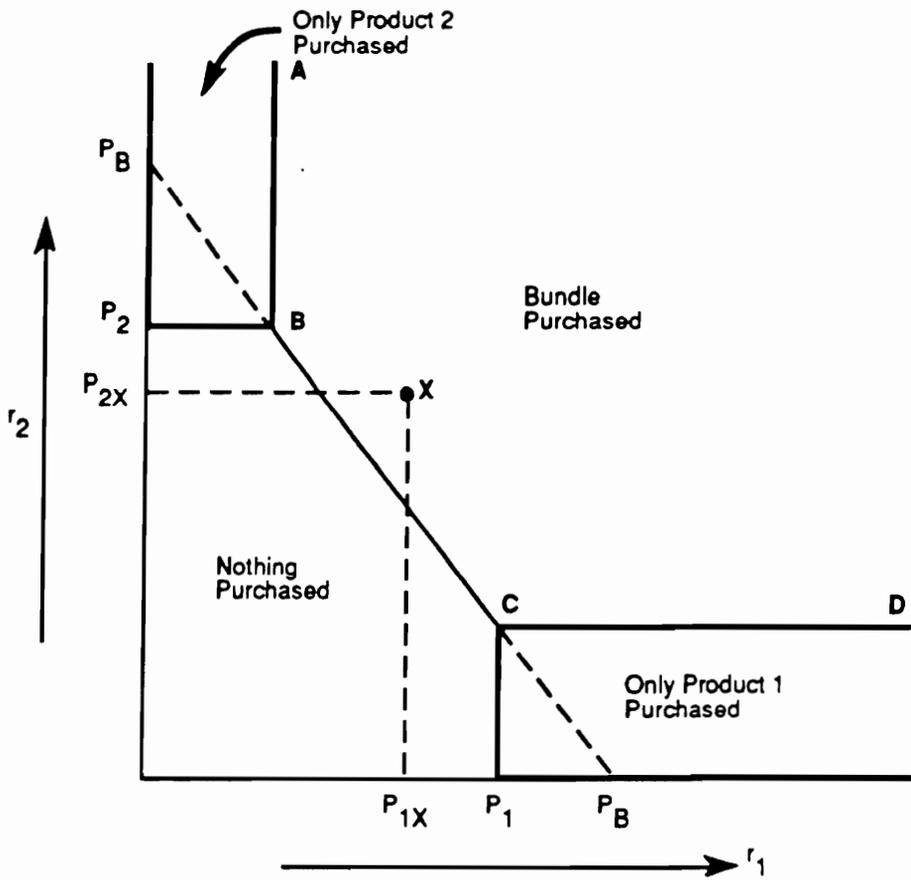
As $n_1 > n_2$, the amount represented by $P_A + n_1 P_B$ will be greater than $P_A + n_2 P_B$. That is, the heavy user pays more in time T for using the primary product A. In a study of several cases involving tie-in sales, Bowman (1957) and Burstein (1960) found that P_A was usually close to the cost of production of the primary product A. It appears, therefore, that sellers practicing tie-in sales intended to break even on the sale of the

primary product and obtained most of the profit on subsequent sales of the supply B. As shown above, a higher effective "price" for A ($P_A + n_1P_B$) was charged from the heavy users--which, as indicated earlier, is price discrimination.

Price Discrimination by Sorting Consumers

Adams and Yellen (1976) have argued that bundling practices are profitable because they enable sellers to sort consumers on the basis on their reservation prices. To illustrate the type of sorting that Adams and Yellen refer to, examine Figure 2. The horizontal and vertical axes indicate the reservation prices (of consumers) for products 1 and 2, respectively. The quadrant formed by these two axes is, therefore, the reservation price space in which all consumers can be located. For example, one hypothetical consumer is shown at 'X' with reservation prices P_{1x} and P_{2x} for products 1 and 2 respectively.

Suppose the seller prices products 1 and 2 at P_1 and P_2 respectively. Let the bundle consisting of products 1 and 2 be priced at P_B . Consider, now, the purchase behavior of consumers in the four segments marked with bold lines as follows: 1) $P_2 BCP_1$, 2) P_2BA , 3) ABCD, and 4) P_1CD . Consumers in the segment P_2BCP_1 will buy neither of the individual products ($r_1 < P_1$ and $r_2 < P_B$). Product 2 will be bought by consumers in P_2BA ($r_2 > P_2$). However, they will not purchase Product 1 separately ($r_1 < P_1$). Also, the bundle will not be purchased because the implicit price for product 1, if the bundle is purchased, will be $P_B - P_2$ and $r_1 < P_B - P_2$



Source: Adapted from Adams and Yellen (1976)

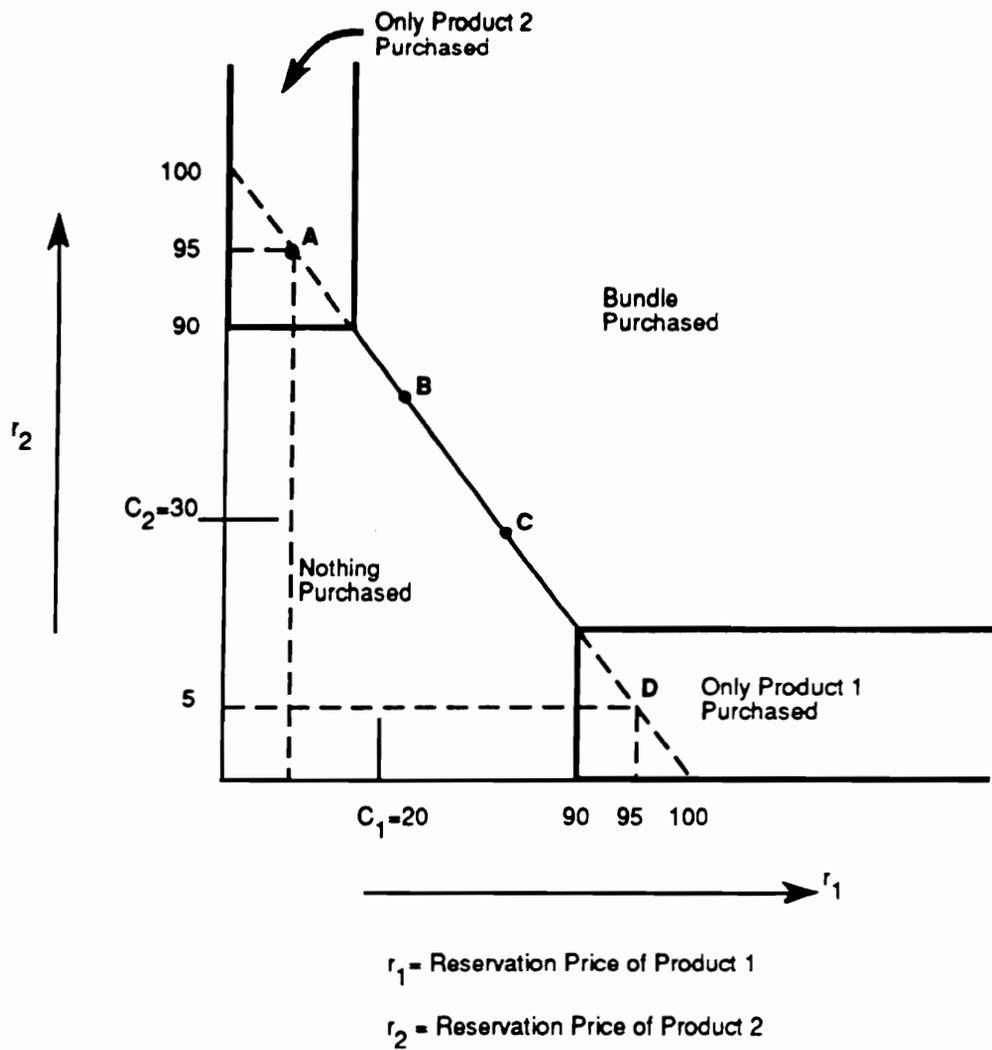
NOTE: r_1 is reservation price of product 1; r_2 is reservation price of product 2.

FIGURE 2. SORTING OF CONSUMERS

(note that $r_1 < P_2B$ and $P_2B = P_2P_B$ by geometry). In other words, purchasing the bundle would imply paying an implicit price for product 1 that exceeds its reservation price. By similar arguments involving the consumers' reservation prices it can be shown that consumers in ABCD will buy only the bundle and those in P_1CD will choose to purchase only product 1. The purchase behavior of the four segments is shown in the figure.

Hence offering products individually and as a bundle enables the sellers to segment the consumers. Figure 3 illustrates a situation where this type of segmentation can enhance the seller's profit. The figure depicts a reservation price space similar to that presented in Figure 2 earlier. The cost of products 1 and 2 are indicated as C_1 and C_2 on the horizontal and vertical axes respectively. A, B, C, D are four hypothetical consumers who value the bundle equally ($r_1 + r_2 = 100$), but the individual items (1 and 2) differently. For example, A's valuation of product 2 is \$95 as compared to D's valuation of \$5. As in Figure 2, the four segments are identified with bold lines. Purchase behavior of the segments is also shown.

As was argued earlier in the context of Figure 2, A will buy only product 2, B and C will purchase the bundle consisting of 1 and 2, and D will choose to buy only product 1. Now examine the relative profitabilities, shown in Figure 3, of 1) pure components, 2) pure bundling, and 3) mixed bundling strategies. Recall that in a pure components strategy, product 1 and 2 will be offered only individually. When each product is priced at \$90, A buys product 2 and D buys 1. The net profit to the seller will thus be $(90 - C_1) + (90 - C_2) = 130$. Similarly, it can be shown that



STRATEGY	PRICE			PROFIT
	PRODUCT 1	PRODUCT 2	BUNDLE	
PURE COMPONENTS	90	90	—	130
PURE BUNDLING	—	—	150	200
MIXED BUNDLING	90	90	150	280

FIGURE 3. PROFITABILITY OF DIFFERENT STRATEGIES

the net profit for pure bundling (products 1 and 2 sold together) and mixed bundling (1 and 2 offered individually and also as a bundle) will be \$200 and \$280 respectively. Hence both pure and mixed bundling strategies result in an increase in net profit over a non-bundling (pure components) strategy.

Dealing with Uncertainty About Product Quality

Another rationale for bundling, proposed recently by Kenny and Klein (1983), focuses on the uncertainty experienced by sellers and buyers about the quality of products that sellers offer to the buyers. They analyzed a situation where a seller offers several products to prospective buyers, but the seller and the buyers cannot make an accurate determination of the products' quality without incurring excessive inspection costs. In their analytical model, quality assessments can be made by the buyer only after "consumption."

One example offered by the authors goes back to the 1930's when major movie studios would sign contracts with movie theaters to exhibit movies even before their production was completed. Hence, theaters and studios would contractually agree on the details of the exhibition schedule and payment for a movie (or movies) before accurate assessments of quality could be made either by the studio or the theater. In situations characterized by such uncertainty, they showed that some form of bundling, as opposed to offering products individually, would reduce search costs for both the seller and the buyers. The authors argued that this increase in

transaction efficiency motivates sellers to adopt a bundling strategy. Regarding the movie example presented above, there is evidence that studios did in fact bundle their movies--the phenomenon of "block booking."

Using Kenny and Klein's (1983) conceptualization, Holt and Sherman (1986) showed that bundling can also increase total economic surplus, defined as:

$$\begin{aligned} & \text{seller surplus} + \text{consumer surplus} \\ & = \text{seller profit} + (\text{reservation price} - \text{actual price}). \end{aligned}$$

The authors also presented results of a laboratory experiment in which sellers and buyers transacted products of uncertain quality using an oral auction. In any given transaction period, each seller would receive two cards from a deck of cards, each at a constant cost per card. The cards would be kept face down till the card or cards were sold. To create uncertainty about quality, the sellers and buyers were told that a black card implied a good quality product and a red card meant that the quality was inferior. Because the cards were kept face down until the auction transaction was completed at a certain price, both the seller and buyer would be unaware of the color (i.e., quality) they were buying or selling. However, a buyer had the option of returning his merchandise (cards) immediately after the transaction was completed. The seller would then have to refund the price he obtained. Returned cards could not be resold. A competitive environment was created by making the sellers compete among themselves. Sellers and buyers kept written records of prices charged or paid.

The experiment provided some interesting results that support Kenny and Klein's (1983) arguments. Holt and Sherman (1986) found that, as

trading between sellers and buyers continued, there was an increased tendency on the part of the sellers to bundle their products: instead of selling cards of uncertain quality individually, sellers engaged in bundling by offering the two cards together for a single price. Holt and Sherman (1986) interpreted this increased tendency to bundle as evidence that bundling could emerge in competitive environments characterized by uncertainty about product quality.

Section Summary

Given the prevalence of bundling practices, a large body of the economics literature has sought to identify the reasons that motivate sellers to adopt a bundling strategy. This section discussed four such motivations: 1) disguised price discrimination, 2) identifying heavy and light users (or metering), 3) sorting consumers into segments based on reservation price, and 4) dealing with uncertainty about product quality. In the first three motivations, reservation price is an important operative variable; bundling enables the seller to take advantage of differences in reservation prices among prospective buyers. The fourth motivation invokes the notion of seller and buyer uncertainty to explain the widespread use of bundling. The essential argument there is that, in situations where sellers and buyers are uncertain about the exact quality of the products they transact, buying and selling in bundles may decrease transaction costs and increase total economic gain.

BUNDLING RESEARCH: CONCEPTUAL DEVELOPMENTS

Ever since Stigler (1963) first presented his pioneering analysis of a bundling practice called block booking, a large body of the economics literature has continued to examine this frequently-used marketing strategy. This section reviews some major conceptual developments in this stream of research. The focus of this review will be primarily on 1) the substantive questions examined, 2) assumptions made, and 3) conclusions reached.

Discrete Reservation Prices

Reservation price, defined earlier as the maximum price one is willing to pay, has continued to be an important variable in the analytical models that have been proposed to explain the prevalence of bundling practices. The basic thrust of these models is to establish that a seller can increase his profits by taking advantage of differences in reservation prices. Stigler's (1963) conceptualization concerning negatively correlated reservation prices and Adams and Yellen's (1976) framework formalizing Stigler's ideas are now examined.

Negatively Correlated Reservation Prices

In constructing his conceptual model, Stigler (1963) assumed a finite number of buyers, each buyer's preferences described completely by

a set of reservation prices. For example, in the two-product scenario analyzed by Stigler, each buyer's preferences were assumed to be contained completely in the set of reservation prices (r_1, r_2) --subscripts 1 and 2 referring to products 1 and 2 respectively. This reservation price distribution is discrete in the sense that each buyer can be represented completely by a set of discrete coordinates r_1 and r_2 .

In a situation comprising of one seller and two buyers, Stigler showed that bundling two products could increase the seller's profit. Stigler also identified a necessary condition for an increase in profitability. His analysis indicated that the reservation prices of the two buyers should exhibit preference reversals. That is, if buyer A valued product 1 more than buyer B, then buyer B should value product 2 more than buyer A. Alternatively, this implies that r_1 and r_2 are negatively correlated. With this type of a reservation price structure, Stigler demonstrated that bundling could always be more profitable than selling the two products individually.

The Adams and Yellen Framework

More than a decade after Stigler's analysis, Adams and Yellen (1976) rekindled research interest in bundling by presenting an interesting framework to explain the prevalence of bundling practices. The authors' primary objective was to demonstrate that bundling could be profitable even in the absence of production economies or complementarities between the products.

Some of the assumptions in their analytical framework were made purposely restrictive:

- 1) $r_1 + r_2 = r_B$, implying that reservation price for the bundle (r_B) was simply the sum of the individual item's reservation prices (r_1 and r_2). This so-called additivity assumption ensured that there was no complementarity between the bundle's individual items; complementarity would imply $r_1 + r_2 < r_B$, the bundle being worth more than the sum of its parts.
- 2) marginal costs of production were assumed to be constant to eliminate production economies.

The remaining assumptions, however, were restrictive and decreased the generalizability of Adam and Yellen's theoretical conclusions. First, the authors' analysis referred specifically to a monopolistic seller which precludes any direct extension to competitive environments. Second, like Stigler's previous analysis of bundling, the authors assumed a discrete reservation price distribution. Third, the marginal utility of a second unit (of either the bundle or its individual items) was assumed to be zero because the authors were not interested in investigating multiple-unit purchases. However, this assumption is restrictive because it does not permit an analysis of multi-pack transactions that sellers employ frequently.² Finally, the Adams and Yellen framework considers bundles consisting only of two individual items. The framework, there-

² Paroush and Peles (1981) subsequently relaxed this assumption and found that bundling leads to a loss in total economic welfare

fore, does not address profit implications for larger bundles with more than two items.

Despite the limitations of these assumptions, Adams and Yellen demonstrated a clear profit motive to bundle. They simulated a number of discrete reservation price distributions and found that some form of bundling (pure or mixed) was always more profitable than selling the bundle items individually. In their analysis of consumer welfare issues, the authors demonstrated that bundling could lead to both an increase or decrease in economic measures of consumer welfare--it all depends on details of the reservation price distribution in the market, prices charged by the seller, and production costs. The specific public policy advice offered by the authors was that governments should "embark on policies that achieve competitive supply of each. . . good separately [and] monopoly itself must be eliminated to achieve high levels of social welfare." (pp. 497-498)

Continuous Reservation Prices

The analyses presented by Stigler (1963) and Adams and Yellen (1976) modeled the purchasing behavior of a market consisting of a finite number of buyers. The reservation price distribution in the market in these analyses is discrete in the sense that each buyer is represented by a unique set of discrete reservation prices. Schmalensee (1986) extended previous research on bundling by relaxing the assumption of a finite number of buyers. Instead of representing a finite number of buyers as discrete

points in a reservation price space, Schmalensee modeled continuous reservation price distributions.

Schmalensee's work retained all the major assumptions made previously in the Adams and Yellen (1976) framework. The only difference is that reservation prices of the two bundle items are assumed to have a bivariate normal distribution.³ If RP_1 and RP_2 are, respectively, the reservation prices of bundle items 1 and 2, the joint distribution of (RP_1, RP_2) would be bivariate normal.

Schmalensee demonstrated that the profit function was not globally concave (left half of an inverted U). However, his analyses indicated that a unique profit-maximizing price (of the bundle) always existed. In other words, given the cost and reservation price distribution, it was shown that a unique bundle price always exists which maximizes profits. Contrary to Stigler's (1963) earlier conclusion, negative correlations between the reservation prices (of the two products) were shown to be neither a sufficient nor a necessary condition for bundling to be more profitable. Profitability was found to be enhanced when the individual reservation prices were uncorrelated and the mean reservation price of each product was high in relation to its cost.

³ To illustrate the three dimensional shape of this distribution, first consider a normally distributed curve with a vertical line of symmetry drawn through the curve's peak. The three dimensional space traced by rotating the normal curve about its line of symmetry approximates a bivariate normal distribution

Considerations of Utility

An important assumption made by both Adams and Yellen (1976) and Schmalensee (1984) pertains to the reservation price of bundle items and the reservation price of the bundle. They assumed that the reservation price of the bundle would be the sum of the item reservation prices. The implicit assumption, therefore, is that

$U = x + y$, where
 x = utility of bundle item x ,
 y = utility of bundle item y , and
 U = utility of the bundle.

Dansby and Conrad (1984) presented a more general analysis in which U was assumed to be a function of x and y (i.e., $U = b(x,y)$). They analysed the following cases:

$b(x,y) > x + y$ (b is orthogonally superadditive)
 $b(x,y) < x + y$ (b is orthogonally subadditive)

The authors demonstrated that when sufficient diversity existed in the evaluation of the bundle (relative to the items), then mixed bundling served the interests of both the firm and the consumers.

The authors also introduced a term called degree of additivity. This was defined as

$$D(x, y) = (x + y) - b(x, y).$$

Defined this way, $D(x, y) > 0$ if b is subadditive and $D(x, y) < 0$ if b is superadditive. The degree of additivity was shown to determine the relative profitability of bundle sales versus unbundle sales. The joint distribution of the bundle items' reservation prices was also shown to influence the relative profitability.

Kinberg and Sudit (1979) examined bundling situations in the context of the international tourism industry. Like Dansby and Conrad (1984), they too relaxed the $b(x,y) = x + y$ assumption. If x and y are the two items of a bundle, cross-selling probabilities were defined as:

$P(X/Y)$ = probability of purchase of X by a purchaser of Y

$P(Y/X)$ = probability of purchase of Y by a purchaser of X .

Transition probabilities were defined in a similar manner to obtain a probabilistic measure of the switching behavior of various types of buyer groups. For example, suppose a seller decides to adopt a pure bundling strategy for X and Y . Therefore, when the firm has just moved from an unbundle to a bundle strategy, there will be four types of buyer groups or market segments:

Type 1: those who buy X and not Y

Type 2: those who buy Y and not X

Type 3: those who buy both X and Y as a bundle.

Type 4: those who buy neither X nor Y

For each of the three types of buying groups, the transition probability gives an estimate of the transition to the bundle (i.e., the conditional probability of purchasing the bundle).

Cross selling and transition probabilities were subsequently used by the authors to model the profitability of different bundling strategies (specifically, bundles of different sizes).

Incorporating Competition

Recently, Guiltinan (1987) provided an analytical framework that incorporates marketing strategic objectives directly into the decision problem

of selecting profitable bundling arrangements. The author showed that strategic objectives (e.g., increasing the sales of A over B) and existing demand conditions in the market can be analyzed together to identify profit-enhancing bundling possibilities. This study relaxed many simplifying assumptions that have been made in the economics literature (e.g., seller has monopoly power over one element of the bundle; reservation price of bundle is the sum of the individual reservation prices of the items). The author illustrated the inadequacy of these assumptions by providing examples of instances where they were violated.

Guiltinan (1987) provided strong arguments against the additivity assumption. For reservation prices, this assumption implies

$RP(x, y) = RP(x) + RP(y)$, where
 $RP(x, y)$ = reservation price of bundle consisting of X and Y,
 $RP(x)$ = reservation price of element X, and
 $RP(y)$ = reservation price of element Y.

As indicated earlier, Dansby and Conrad (1984) and Kinberg and Sudit (1979) also relaxed this assumption. Guiltinan, however, provided justification for why this additivity assumption will usually be violated. He invoked Oxenfeldt's (1966) argument that products/services usually have complementarity relationships. Because of synergies between X and Y, $RP(x, y) \neq RP(x) + RP(y)$.

Guiltinan's work is an important step in providing a marketing-oriented analysis of bundling. Though it relaxes many assumptions, the behavioral content of the approach is inadequate.

A Focus on Uncertainty

Prior to the early 1980's, research on bundling was based on an implicit assumption of perfect information. Specifically, sellers were assumed to know the exact "worth" of their products. Kenny and Klein (1983) found this assumption too restrictive, arguing that there are several instances where a seller may be uncertain about the exact quality of his products. This uncertainty about quality may translate into uncertainty about the appropriate price the seller should charge (assuming, of course, that the "appropriate" price and quality are related). Eventually, this uncertainty may result in uncertainty about the price buyers would be willing to pay--that is, uncertainty about buyers' reservation prices.

Kenny and Klein showed that, faced with an uncertainty of this nature, a seller can adopt a bundling strategy and make transactions more efficient by reducing transaction costs. Employing Kenny and Klein's uncertainty argument, Holt and Sherman (1986) demonstrated that bundling practices could emerge not only in monopolistic market situations (as established in previous research) but also in competitive environments. The so-called uncertainty rationale articulated by Kenny and Klein represents a useful development in bundling research because it focuses on issues other than the seller's profit motivation.

Creating "Optimal" Bundles

Consider a seller who wishes to sell three products: A, B, and C. Given that these products can be sold either individually or in some

bundle form, seven possible selling strategies can be identified as follows: A, B, C, (AB), (AC), (BC), (ABC), with the parentheses indicating bundles.

It is quite likely that implementing all of these seven strategies may not be possible or even profit maximizing. The idea behind creating "optimal" bundles is to identify that subset of selling strategies that can maximize the seller's profit. For example, in the three-product situation considered above, a selling strategy consisting of A, (AC), and (ABC) may be most profitable. But how can this profit maximizing subset be identified? A few algorithms that attempt to identify such subsets are now briefly discussed.

An Early Algorithm

As indicated above, a total of seven ($2^3 - 1 = 7$) strategies can be identified for three products A, B, and C. In general,

$K = 2^n - 1$, where

K = number of selling strategies and

n = number of individual products.

The quantity, $2^n - 1$, can grow into a very large number even for moderate values of n . For example, $K = 1023$ with $n = 10$. Thus, in many real-world applications K can be quite large.

The algorithm developed by Kinberg and Sudit (1979) identifies the optimal subset from the all-possible set of $2^n - 1$ selling strategies. Basically, the algorithm starts by computing the profitability if all

2^n-1 selling strategies were implemented. Then, the algorithm reduces the set from 2^n-1 to $(2^n-1) - 1$ by arbitrarily dropping one selling strategy such that the profitability of the reduced subset is greater. This process of sequentially eliminating selling strategies is continued till no further increase in profitability can be obtained. The subset of strategies that remains at the end of this iterative procedure is deemed "optimal."

The algorithm has two major drawbacks. First, the iterative procedure described above does not guarantee a global optimal solution; in some situations it may converge at a local optimum. However, the authors indicate that as long as the bundle is subadditive, the algorithm will identify a global optimum. The condition of subadditivity (for a two-product bundle) implies $U(AB) < U(A) + U(B)$, where

$U(AB)$ = utility of the bundle,
 $U(A)$ = utility of the item A, and
 $U(B)$ = utility of the item B.

In general, therefore, the utility of the bundle ought to be less than the sum of its parts. Although this subadditivity condition may be achieved in some situations, it does limit the general applicability of Kinberg and Sudit's algorithm.⁴

The second drawback pertains to the informational requirements of the algorithm. Specifically, the algorithm requires probability estimates of buyers switching from one bundle form to another as the seller alters

⁴ One way to avoid this local-optimum problem may be to adopt the modeling strategy used by Kohli and Park (1987). Although their specific modeling context is different from the present one, Kohli and Park used a dynamic programming procedure to identify an "optimal" subset of bundling strategies. Their procedure is free of the local optimum problem.

his selling strategy. In many real-world applications, however, accurate estimates of such probabilities may not be readily available.

Integer Programming Model

The integer programming model (Hanson 1987; Hanson and Martin 1987) is designed to determine a profit-maximizing pricing strategy in the context of bundle offers. The model provides answers to two managerially-relevant questions: 1) which bundles should be offered, and 2) how should they be priced?

In the discussion of Kinberg and Sudit's (1979) algorithm presented above, it was shown that the total number bundling strategies can be quite large. The integer programming model proposes that managerial judgment be first employed to create a subset of bundling strategies. Generally speaking, bundles characterized by a large degree of subadditivity (i.e., the bundle's utility is much less than the sum of its parts) are eliminated to obtain a subset of bundling strategies.

The following factors are incorporated in the integer programming model:

- number of segments and size of the market segments
- reservation prices of the bundles and bundle items in the market segments
- set-up costs of production
- direct variable costs of production
- other costs unique to serving different segments.

The model output indicates which (if any) of the bundling strategies contained in the pre-specified subset should be eliminated from further consideration. In addition, profit-maximizing prices of the bundles and

bundle items are also contained in the model output. The model, therefore, appears to be potentially useful in creating bundling strategies. However, the initial subset of bundling strategies are based on managerial judgment and prone to errors. One way to supplement managerial judgment may be to involve a representative set of prospective buyers in the creation of subsets. Another drawback is that the model requires specific information about reservation prices which, in many situations, may not be readily available.

Emerging Behavioral Ideas

A major part of the literature on bundling focuses primarily on market-level consequences (e.g., overall seller profit) and issues related to public policy (e.g., effect on consumer welfare). The research efforts reviewed above reflect this type of an aggregate orientation. Individual buyer behavior is rarely incorporated explicitly in the existing analytical frameworks. In those modeling contexts where some reference has to be made to individual buyer behavior, the most common approach is to proceed by making some simplifying assumptions (e.g., a bundle utility being equal to the sum of its parts).

In recent years, however, researchers with interest in marketing and consumer behavior have focussed attention on buyer behavior in the context of bundle offers. Two such research efforts, Goldberg, Green, and Wind's (1984) "decomposition" approach and Gaeth and Levin's (1987) information integration conceptualization, are now discussed.

Decomposing Overall Bundle Preference

Given the paucity of empirical data about the behavioral aspects of bundling, a study reported by Goldberg, Green, and Wind (1984) will be examined in some detail (also see Wind, Green, Shifflet, and Scarbrough 1989). In this study, Goldberg et al. used a hybrid conjoint model to examine whether "one can predict a respondent's evaluation of a bundle...as a simple function of the summed part worths of the entities making up the bundle" (p. S114).

This study was conducted in the context of hotel amenities. Six facets of hotel amenities were used in the study. These included: atmosphere/facilities, room, recreation/sports, lounge entertainment, security, and associated services. Each facet had further sub-levels (attributes) and each attribute had several attribute levels. There were a total of 43 attributes and over 100 attribute levels.

In phase 1 of the study, information was collected about the acceptability (and unacceptability) of each attribute level. The incremental price for each attribute level was also provided to the subject. Consider one such example:

<u>Facet</u>	<u>Attribute</u>	<u>Attribute Level</u>	
Associated Services	Bellman	Yes (0.45)	No (0.00)

Information for the attribute level "Yes" implies that if a bellman is provided by the hotel, it will cost an incremental \$0.45 to the customer. The level "No" implies that if no bellman service is provided,

there will be no incremental cost to the customer. For each of these two levels (and the remaining hundred or so other levels), subjects were asked to indicate whether they found it acceptable or unacceptable. For each attribute, subjects could indicate just one acceptable attribute level.

In phase 2, importance weights for six facets were determined for each subject. In phase 3, each subject was shown five full profiles of hotel amenities. Each profile can be considered a bundle. The bundle price too was specified. The subjects were asked to indicate their preference for each profile on a 10-point scale anchored at "Probably would never stay" and "Almost certain to stay there."

Employing canonical correlation, the categorical data collected in phase 1 was used to compute the aggregate part worth for each attribute level. Using the importance weights, the authors constructed a linear combination of part worths for each subject-profile combination. They then attempted to predict the best-profile for a subject using this linear function. The prediction was then compared with the actual best profile.

The authors reported the following substantive findings:

1. Simple linear functions of subjects' self-explicated utilities for bundle items are not good predictors of the preferences for the bundle. Only 38.3% (69 out of 180) best-profiles were correctly predicted using this method. Equal weights (instead of subject-obtained weights) improved the prediction slightly.

2. The bundle-price accounts for a statistically significant amount of variance in the preference for bundles.

Information Integration Theory (IIT) Approach

IIT: An Overview. To consider the essentials of this theoretical approach, let S_1 and S_2 be two information elements presented to a person. If the task is evaluative, S_1 and S_2 can be regarded as providing information about the focal entity (e.g., person, place, thing, or act). For instance, in the case of person perception, S_1 and S_2 could provide personality-related information. The first study in this area, in fact, was conducted in the context of person perception. Some examples of S_1 used by Anderson (1962) are level-headed, unsophisticated, and ungrateful; good-natured, bold, and humorless are some values of S_2 employed in the study.

Let exposure to S_1 and S_2 lead to an overt response R . In the example pertaining to person perception presented above, R was likability (i.e., degree of likability toward a person with S_1 and S_2 personality characteristics). In other words, S_1 and S_2 are processed in some way that eventually leads to the overt response R . IIT seeks to describe and explain how this is accomplished.

Figure 4 shows S_1 and S_2 on the left hand side of the box. Let the box represent the perceptual apparatus that eventually leads to the overt response R . IIT defines s_1 and s_2 (as shown in Figure 4) as the subjective analogies of the objective stimuli S_1 and S_2 . According to IIT, s_1 and s_2 are cognitively combined to form an intermediate response r which is then externalized in the form of R . Having defined these concepts, IIT's additive hypothesis is:

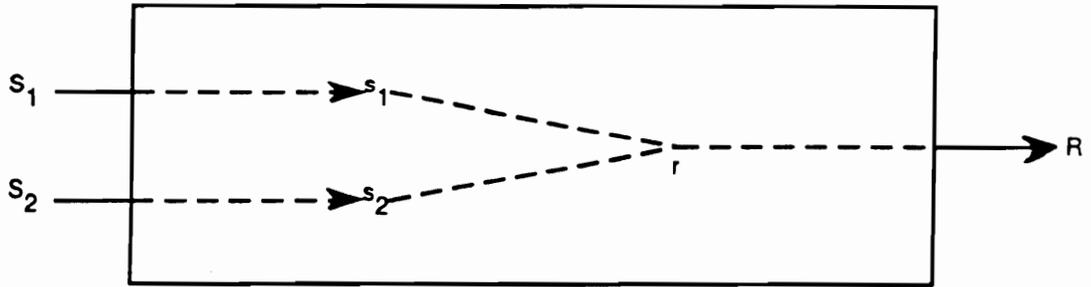
$$r = s_1 + s_2 \quad (1)$$

That is s_1 and s_2 are added by the human perceptual apparatus to form r . One problem with equation (1) is that all three variables are unobservables. If they cannot be observed, how can IIT's additive hypothesis be assessed?

IIT circumvents the measurement issue in an ingenious manner. Consider a simple 2×2 factorial design. Along one factor, let S_1 be varied over two levels. Similarly, let S_2 be varied over two levels along the second factor. In each of the four cells formed by this design, let the externalized response R be measured. Then, according to IIT, if equation (1) is true and R is a linear ("equal interval") function of r , then interaction between the two factors in the above design will be zero. This assertion is referred to as the parallelism theorem.

In addition to the additive hypothesis mentioned above, IIT also proposes some other combination rules. In the averaging hypothesis, s_1 and s_2 are averaged. The multiplicative hypothesis posits that s_1 and s_2 are multiplied.

Starting with Anderson's (1962) study, IIT has been applied to several different phenomena like person perception, preference for alternative towns, likelihood of using a particular transit system, and others (see Gaeth and Levin 1987 for a concise summary). The evidence from these studies constitutes strong support for IIT's theoretical assertions. For a recent articulation of IIT, see Anderson (1981).



Source: Anderson (1962)

FIGURE 4. THE PROCESSING OF STIMULI IN INFORMATION INTEGRATION THEORY

Application of IIT to Bundling. Gaeth and Levin (1987) have argued that IIT is a useful theoretical basis to examine issues related to the evaluation of bundles. According to their model, each product in a bundle is represented as a set of several objective attributes (e.g., quality, price, brand). The subjective perceptions of these attributes, it is hypothesized, are combined through an integration process to evaluate each product. These evaluations are subsequently integrated to form an overall evaluation of the bundle.

Basing their arguments on findings from the IIT research program, Gaeth and Levin (1987) have proposed (but did not test) the following propositions:

- P_1 : When buyers evaluate a product bundle, the attributes of individual products will be integrated by an averaging process.
- P_2 : The perceived value of the bundle will not necessarily be the simple sum of the perceived value of its parts.
- P_3 : There will be interaction between attributes across products in the bundle.
- P_4 : Propositions 2 and 3 will be moderated by the perceived degree of relatedness between products in the bundle.

Section Summary

This section reviewed the existing literature on bundling. Research interest in bundling goes back to the 1960's when Stigler (1963) presented a price discrimination rationale for a bundling practice called block booking. Since Stigler's pioneering analysis, most research efforts have sought to examine two primary questions: 1) why are bundling practices

so prevalent? and 2) what are the welfare consequences of bundling? Adams and Yellen's (1976) analytical framework demonstrated that bundling increases seller profitability by sorting consumers on the basis of their reservation prices. Schmalensee (1984) extended Adams and Yellen's conceptualization by modeling continuous reservation prices instead of discrete reservation prices.

Another important assumption made in the contributions of Adams and Yellen and Schmalensee pertains to a bundle's utility. They assumed that a bundle's utility is simply the sum of its parts. Dansby and Conrad (1984) relaxed this assumption by modeling situations where bundles were either more or less than the sums of their parts. They concluded from their analyses that sufficient diversity in utility assessments of a bundle can result in bundling being more beneficial to both sellers and buyers.

Gultinan (1987) incorporated competition explicitly in his analysis and presented a normative framework to aid bundling decisions. In another conceptual development, Kenny and Klein (1983) relaxed the perfect-information assumption made in the earlier analyses. They showed that when both sellers and buyers cannot make an accurate determination of some products' quality, a bundling strategy results in increased transaction efficiency (i.e., decreased transaction costs). Holt and Sherman (1986) presented empirical evidence supporting Kenny and Klein's conceptualization.

Kinberg and Sudit's (1979) algorithm and Hanson and Martin's (1987) integer programming model were also discussed. Kinberg and Sudit's algo-

rithm identifies a profit-maximizing subset of bundling strategies. The integer programming model, on the other hand, starts with a pre-specified subset of bundling strategies and determines a profit-maximizing pricing scheme. Finally, two behavioral approaches (Goldberg, Green and Wind 1986; Gaeth and Levin 1987) were presented.

The primary focus of this section has been on presenting details of different approaches that have been proposed in the context of bundle evaluation. The next section presents a critical assessment of these approaches.

BUNDLING LITERATURE: A CRITICAL ASSESSMENT

The literature on bundling provides many insights about the phenomenon. With welfare and public policy implication high on their priority list, economists naturally examined the phenomenon to discover seller incentive. The possibility of a price discrimination incentive was proposed more than two decades ago by Stigler (1963). In the intervening period since then, economists have continued to examine this phenomenon from other perspectives (e.g., Adams and Yellen 1976; Kenny and Klein 1983) and have proposed other rationales to explain the prevalence of bundling practices.

Examining the body of the bundling literature from the interdisciplinary perspective of marketers and consumer behavior researchers reveals several shortcomings and unaddressed issues. This section discusses some of them.

Predominant Focus on Seller and Aggregate Market

As the review of the bundling literature indicated, a predominant focus has been on sellers and the aggregate market. A common approach adopted by the analytical framework is to establish a profit motive for the seller and then proceed to examine public policy implications. The need to understand individual buyer behavior was circumvented by making simplifying assumptions.

An approach such as this is quite consistent with economic theory in general. Assumptions are usually made to ensure analytical tractability and then it is assumed that "the relevant agents (on average) act accordingly" (Thaler 1985). This quantum leap from a normative to a descriptive account is in most cases, unacceptable (Thaler 1980).

But why, in the context of economic theories, is it necessary to understand individual behaviors? It is necessary because any theory that pertains even indirectly to individuals cannot assume away the realities of individual behavior. Consider, for instance, von Neumann and Morgenstern's (1945) expected utility theory. Systematic violations of the theory were documented for years and the analytical framework proved incapable of being a good predictor of individual choice behavior. After Kahneman and Tversky (1979) modified expected utility theory by making its elements consistent with individual choice behavior, the analytical framework became a better predictor of individuals' choices (Currim and Sarin 1989)

Consider, now, the economic conceptualization pertaining to bundling. It is true that the conceptualizations are designed to explain aggregate behavior. But the decisions (e.g., to buy or not to buy a bundle) are made by individuals, aren't they? Hence, any conceptualization that remains silent about individual buyer behavior provides, at best, an incomplete account of the phenomenon.

Another justification to examine individual buyer behavior is managerial. An examination of the market-level consequences (e.g., seller profitability) may be sufficient to establish a profit motive. However, a macro orientation is often inadequate in providing specific marketing strategies for managerial use. Consider, for example, the following pricing question: Given two products A and B such that utility of A and B together (in a bundle) is greater than the sum of their individual utilities, at what specific price should the bundle be sold? The economic conceptualizations are inadequate in answering such questions. In a similar context, Nagle (1984) notes that

"Economic models are not designed to describe realistically the way firms make pricing decisions or the way consumers respond to those decisions. Economic models are abstractions; they hold constant many real variables that are not germane to their theoretical objectives. Consequently, they rarely provide practical algorithms for implementing pricing strategies." (p. S3-S4, emphasis added).

Because value assessments and purchase decisions are mediated by individual buyer behavior, it is necessary to study buyer behavior in the context of bundling. Insights obtained from the study of individual processes can then aid the creation of practical pricing algorithms.

Analytical Versus Empirical Content

A majority of the bundling literature is primarily analytical. In the context of economic models, only Stigler (1963) attempted to provide empirical support for his price discrimination conceptualization. Another research effort with an empirical orientation is an experimental study reported by Holt and Sherman (1986) which demonstrated support for Kenny and Klein's (1983) uncertainty rationale for bundling. Two other empirical efforts (Goldberg, Green, and Wind 1984; Gaeth and Levin 1987) originated in a stream of research other than economics.

Ideally, research conducted within the positivist paradigm should have a balance of conceptual and empirical activities. In fact, when Popper (1954) proposed that science proceeds through a process of "conjectures and refutations," the implication was that the validity of conceptual ideas ought to be tested against empirical evidence. Research on bundling, though positivist in orientation, has focused almost exclusively on constructing conceptualizations. There is therefore an acute need to empirically verify these conceptualizations and their underlying assumptions.

Unaddressed Behavioral Issues

Existing literature on bundling, with a predominant focus on market-level consequences of bundling, has little to say about individual buyer behavior. It was argued earlier, however, that there is a need to understand how individual buyers evaluate bundle offers.

Given that evaluation processes mediate purchase decisions, questions regarding the evaluation of bundles by buyers is important. Specifically, what is the process used to evaluate bundles? How is information (about a bundle) used by a buyer to form a purchase decision? What is the exact nature of this information processing and what impact does it have on the eventual purchase decision?

Goldberg, Green, and Wind (1984) have raised the issue of information integration. The information integration approach proposed by Gaeth and Levin (1987) suggests that the overall bundle evaluation is formed as a result of an averaging process. One consequence of this averaging process may be subadditivity--the overall bundle utility is less than the sum of its parts. But if the assumption of additivity does not hold, what is the cognitive process by virtue of which the bundle is valued more or less than the sum of its parts? Questions such as this that relate to the underlying process remain largely unanswered.

In the notation introduced earlier, $RP(x,y)$, $RP(x)$, and $RP(y)$ are, respectively, the reservation prices of the bundle and the individual bundle items x and y . Several questions are pertinent in this respect. If $RP(x,y)$ is greater or less than $RP(x) + RP(y)$, then what characteristics and interdependencies of the bundle elements influence the final value of $RP(x,y)$? If complementarity between the bundle items influences $RP(x,y)$, how strong is the influence? When is it more positive and why? In the conceptualization developed in a later section, answers to such questions are explored.

A final, and perhaps the most important, issue pertains to the role of price in the evaluation decision process. If a single price is specified for a bundle, how does a buyer assess how high or low that price is? If a bundle is perceived to be less than the sum of its parts, what price discount is needed before the buyer finds the bundle price acceptable? Alternatively, how much more will a buyer be willing to pay if the bundle valuation exceeds the sum of its parts?

Section Summary

This section presented a critical assessment of the bundling literature. It was shown that the literature has focused primarily on the seller and the aggregate market. Examination of issues related to individual buyer behavior has been inadequate. It was argued that a study of individual buyer behavior is essential to 1) supplement the macro orientation of the economics literature and 2) aid the development of pricing strategies for managerial use. The relative emphasis on analytical versus empirical research was also assessed. It was demonstrated that there is an acute need for empirical work in this area of research. The assumption base of the existing literature was discussed and some unaddressed behavioral issues were presented.

DECISION MAKING LITERATURE: INSIGHTS FOR BUNDLE EVALUATION

Up to this point, this dissertation's primary focus has been on the existing literature on bundling. The insights provided by this body of literature were reviewed and its shortcomings highlighted. Against the backdrop of this review, this section presents some conceptual tools that will be used later in this chapter to articulate this dissertation's conceptualization.

Need For a Behavioral Orientation

The literature on bundling is more or less silent about how individual buyers evaluate bundles. Consider, for example, a sampling of some questions pertinent to bundle evaluation: a) How do buyers examine the information presented in bundle offers? b) What determines the order in which the bundle items are inspected and evaluated? c) How are perceptions of value formed? In their attempt to understand the behavior of aggregate markets, existing conceptualizations circumvent the need to understand individual buyers' behavior by making simplifying assumptions. Although the actual evaluation process for bundles may be quite complex, existing conceptualizations make it appear deceptively simple. For example, it is assumed that a bundle will be purchased as long as the bundle's price is less than the buyer's reservation price for the bundle. Furthermore, it is usually assumed that the utility of a bundle is simply the sum of the utilities of its parts.

Simplifying assumptions of this nature may be necessary to mathematically model the market-level consequences of bundling. Nevertheless, the substantive conclusions of these mathematical models remain contingent on the validity of their assumptions about individual buyer behavior. As indicated earlier, a study by Hanson and Martin (1987) has documented that substantive conclusions of the existing economic analyses are sensitive to the assumptions. Even if the assumptions were not a major concern, existing conceptualizations present almost no insights into how buyers subjectively perceive and evaluate bundles. However, it is often necessary to have knowledge about individual buyer behavior in order to create effective marketing strategies.

To conclude, there are two primary reasons why it is necessary to understand how individual buyers subjectively perceive and evaluate bundles: 1) Extant economic analyses of bundling make several simplifying assumptions about individual buyer behavior. These assumptions remain empirically unverified, although there is evidence that violations of the assumptions can significantly alter the substantive conclusions; 2) Development of effective marketing strategies frequently requires a great understanding of individual buyer behavior. However, the existing literature focuses primarily on the aggregate market and makes almost no attempt to understand individual buyer behavior.

This dissertation focuses specifically on individual buyer behavior in the context of bundling evaluation. Generally speaking, the aim is to understand the psychological processes used by buyers to evaluate bundle offers (form perceptions of value). The psychological processes,

in turn, can be examined by viewing a buyer as a decision maker who actively acquires and processes information. In fact, this dissertation's conceptualization (presented later in this chapter) has a strong information processing orientation. To facilitate the presentation of the conceptualization, some relevant aspects of the decision making literature are now reviewed.

Buyer As Decision Maker

Over the last several decades, a large body of knowledge has been created that seeks to explain and understand the behavior of individuals as decision makers. Research interest in decision making, however, can be traced back more than two centuries to Bernoulli's (1738) work on the concept of utility. Given the vast expanse of the decision making literature, it is neither necessary (nor possible) to review all major developments in this field of research. Instead, this section will aim at providing a broad overview of the relevant literature. The primary emphasis will be on ideas that are relevant to this dissertation's conceptualization.

Two broad streams of research can be identified in the literature on human decision making: normative and descriptive. Normative approaches seek to prescribe behavior--the way behavior should occur. The course (or courses) of action in this approach are usually characterized by some form of optimality. That is, each prescribed course of action is chosen to optimize a certain criterion or a set of criteria (e.g., von

Neumann and Morgenstern's (1945) expected utility theory; Keeny's (1977) multi-attribute models). Even though the predictive ability of normative approaches can be improved by making changes to their basic structure (e.g., Kahneman and Tversky's (1979) prospect theory), decision researchers have felt the need to supplement these approaches with descriptive approaches. Because of the very nature of normative approaches in general, information processing details at the individual level are rarely examined explicitly.

Descriptive approaches, on the other hand, focus on decision making behavior as it actually occurs. These approaches view the individual decision maker as an active information processor (Bettman 1979; Lachman, Lachman, and Butterfield 1979; Newell and Simon 1972). In contrast to the normative approaches in which some form of optimal behavior is derived using a set of assumptions and an optimizing rule, descriptive approaches are not as much interested in optimality per se. Instead, their focus is more on information processing at the individual level. Specifically, these approaches seek to understand and explain 1) how decision makers acquire information in a decision situation, 2) how the acquired information is cognitively represented, and 3) the manner in which the information is manipulated to make judgments and choices (Johnson and Puto 1987).

The next section shows that several results in the decision research literature can be explained by hypothesizing that decision makers make frequent use of a few simple rules called heuristics. One such heuristic,

anchoring and adjustment, plays a central role in this dissertation's conceptual development.

The Prevalence of Heuristics

The normative account implicitly assumes a substantial information processing prowess. Several axioms of expected utility theory, for example, imply a systematic, careful, and accurate approach to information processing. However, as was indicated earlier, many key axioms of expected utility theory have not been validated in empirical tests. Moreover, it is commonly known that decision makers are characterized by quite small short-term memory and other information processing limitations.

For example, Miller (1956) presented his so-called magic number of 7 plus or minus 2 with the argument that short-term memory usually is incapable of storing more than 7 (plus or minus 2) pieces of information. In the context of consumer information processing, studies by Jacoby, Speller, and Berning (1974) and Malhotra (1982) have documented the detrimental effects of information load on the quality of choices made.

What can be made of these information processing limitations? Obviously, the limitations are very real and cannot be denied. However, despite these limitations, human decision making performance is frequently quite good even in complex information environments (Hogarth 1981).

The question, therefore, is how a reasonably satisfactory decision making performance can result from inadequate information processing ca-

pabilities. One possible answer seems to lie in the notion of heuristics, which refers to the general-purpose rules that humans are known to use frequently. These rules, or heuristics, enable humans to deal with complex information environments without putting excessive demands on short-term memory and the information processing system in general. The intriguing aspect about heuristics is that, though intrinsically very elementary, they are capable of approximating the decision performance of the more complex normative models.

Tversky and Kahneman (1974) identified three heuristics that appear to be operative in a wide variety of tasks related to probability assessment. These heuristics are 1) representativeness, 2) availability, and 3) anchoring and adjustment. It may be noted in passing that the anchoring and adjustment heuristic will play an important role in the conceptualization developed later in this chapter. To illustrate the nature of heuristics in general, briefly consider how representativeness, availability, and anchoring and adjustment operate.

Representativeness

The representativeness heuristic is used to determine membership of an object in a class or group of objects. The probability (as assessed by an individual) that the object does indeed belong to a predefined class or group of objects is determined by assessing the objects' similarity with a prototypical member of the class or group. For example, consider

the following hypothetical description: "Mr. Smith has a keen interest in mathematics and science."

Given this very brief description, what can be said about Mr. Smith's occupation? Is he a lawyer, engineer, or a musician? In other words, the question is to determine Mr. Smith's membership in a class or group of occupations. Tversky and Kahneman argued that such assessments are made using the representativeness heuristic. Using this heuristic, an attempt is made to assess the similarity Mr. Smith's description has with a prototypical description of a lawyer, engineer, or a musician; greater the similarity, higher is the assessed probability.

Hence the representativeness heuristic entails making probability assessments by some form of a matching process. Tversky and Kahneman presented empirical evidence to demonstrate that the use of this heuristic frequently leads to biased responses. One such bias is that the so-called base-rate probabilities are frequently ignored. For instance, refer once again to Mr. Smith's description given above. Statistically, the probability that Mr. Smith is an engineer (for example) also depends on the proportion of engineers in the population from which Mr. Smith was sampled. This proportion is the so-called base-rate probability and, from a normative standpoint, should influence assessments of probability. However, as shown by Tversky and Kahneman, base-rate probabilities are frequently ignored (even when known) and thus lead to biased responses.

Availability

This heuristic is used to judge the frequency of an event. Suppose one was asked to estimate the frequency of house fires in a neighborhood. Using the availability heuristic, the frequency would be determined by recalling instances of housefires--a recall of several instances leading to a higher frequency estimate.

This heuristic, like others, is subject to several biases. Note that frequency of occurrence is judged by number of such occurrences that can be recalled from memory. Frequency estimates can be biased because recall from memory can be affected by several factors. One such factor is saliency. Salient events tend to be recalled more easily from memory--that is, they are more "available" in memory. A recent fire in the neighborhood, for example, can improve recall of housefires in general and thus inflate (bias) the frequency estimate of housefires.

Anchoring and Adjustment

This heuristic, subsequently proposed as this dissertation's core conceptual foundation, implies a sequential form of decision making. To illustrate the sequential nature of this heuristic, consider one example provided by Tversky and Kahneman (1974). Suppose you were asked to predict what the Dow Jones Average would be in about 3 months. One way to approach this prediction task could be to first examine the current Dow Jones Average. Then you may want to make adjustments to the current average for your perception of factors such as interest rates, the trade deficit, and

the budget deficit. Such adjustments to the current average may yield your final prediction.

The process described above has distinct characteristics of the anchoring and adjustment heuristic. Generally speaking, this heuristic entails "anchoring" on some piece of information in the decision task and then making adjustments to the initial anchor assessment as subsequent pieces of information are examined. In the Dow Jones example considered above, the current Dow Jones Average served the role of an anchor--that is, a starting point. Adjustments (up or down) were then made to the initial anchor after information regarding interest rates on the deficits was also considered.

Anchoring and adjustment strategies may be used not only in prediction tasks, but in other tasks as well (empirical evidence is presented later). Consider, for example, the following information regarding a prospective graduate student:

GMAT: 750/800

Educational Background: Liberal Arts

Recommendation letters: Average

If you believe that the GMAT score is usually a good measure of scholastic aptitude, you may examine the GMAT information first. The admittedly superior score will thus serve as your initial assessment of the student (i.e., as the anchor assessment). This superior initial assessment, however, may be adjusted down when you subsequently find that the recommendation letters were somewhat disappointing. In sum, the an-

choring and adjustment heuristic seeks to capture this sequential nature of decision making.

As was the case for the other heuristics, anchoring and adjustment strategies are also subject to bias. Specifically, Tversky and Kahneman presented evidence that adjustments made while using the anchoring and adjustment heuristic are usually insufficient. They are insufficient in the sense that the final response tends to be overly influenced by the anchor assessment and inadequately influenced by subsequent information. That is, the final response is usually closer to the anchor assessment than it would be if sufficient adjustments had been made (more on this later).

Section Summary

This section juxtaposed the divergent perspectives of the normative and descriptive approaches to study decision making behavior. Though the human system has a seemingly limited information processing capability, human decision performance frequently comes close to the normative models. This surprisingly good performance, it was argued, is made possible by the use of simple decision strategies called heuristics. Three such heuristics (representativeness, availability, and anchoring and adjustment) proposed by Tversky and Kahneman (1974) were discussed. Though such heuristics enable humans to perform well even in complex information environments, their use can also lead to several biases. (For another perspective on the issues of biases, see Hogarth 1981).

It was indicated earlier that the anchoring and adjustment heuristic plays an important role in this dissertation's conceptualization. In order to further develop certain aspects of anchoring and adjustment, the next section focuses on the process details of this heuristic. Evidence supporting anchoring and adjustment processes is also presented. Insights obtained from examining the heuristic's process details will be then employed to propose a conceptualization of how buyers evaluate bundle offers.

PROCESS DETAILS OF ANCHORING AND ADJUSTMENT

The anchoring and adjustment heuristic was described above as a sequential decision process. Although a few examples were presented to illustrate the general nature of the heuristic, several pertinent questions remain unaddressed. For example, the heuristic implies that an anchor assessment is made first, followed by a series of adjustments. But how does the decision maker decide which specific assessment ought to serve the role of an anchor? Also, the heuristic entails adjustments. But what determines the magnitude and direction of the adjustments? To develop answers to questions of this nature, this section first focuses on the process details of the anchoring and adjustment heuristic. This is followed by a discussion of some empirical studies that have shown support for anchoring and adjustment processes. These insights are eventually incorporated in this dissertation's conceptual model of bundle evaluation.

Stages in Anchoring and Adjustment

Lopes' (1982) model of anchoring and adjustment provides a good description of the underlying processes involved in the heuristic (see Figure 5). In developing her model, Lopes proposed four stages that occur during the anchoring and adjustment process. These stages are now briefly described.

Scanning

During the scanning stage, information available in the judgment or decision task is briefly scanned. The purpose of this stage is not to acquire or understand details of the information. Instead, an attempt is made by the decision maker to orient himself/herself to the task at hand.

If several pieces of information are available for examination (as they typically are), a decision has to be made regarding the order in which the given information elements should be examined. For example, imagine that you are reviewing applications for graduate admission and information on 1) GMAT scores, 2) work experience, 3) educational background, and 4) recommendation letters is made available. During the scanning stage, as articulated by Lopes, you may prefer to look at the four aptitude-related information pieces in a certain order (e.g., first GMAT, followed by recommendation letters, etc.).

More formally, Lopes distinguishes between two types of information presentation formats: undifferentiated and differentiated. When infor-

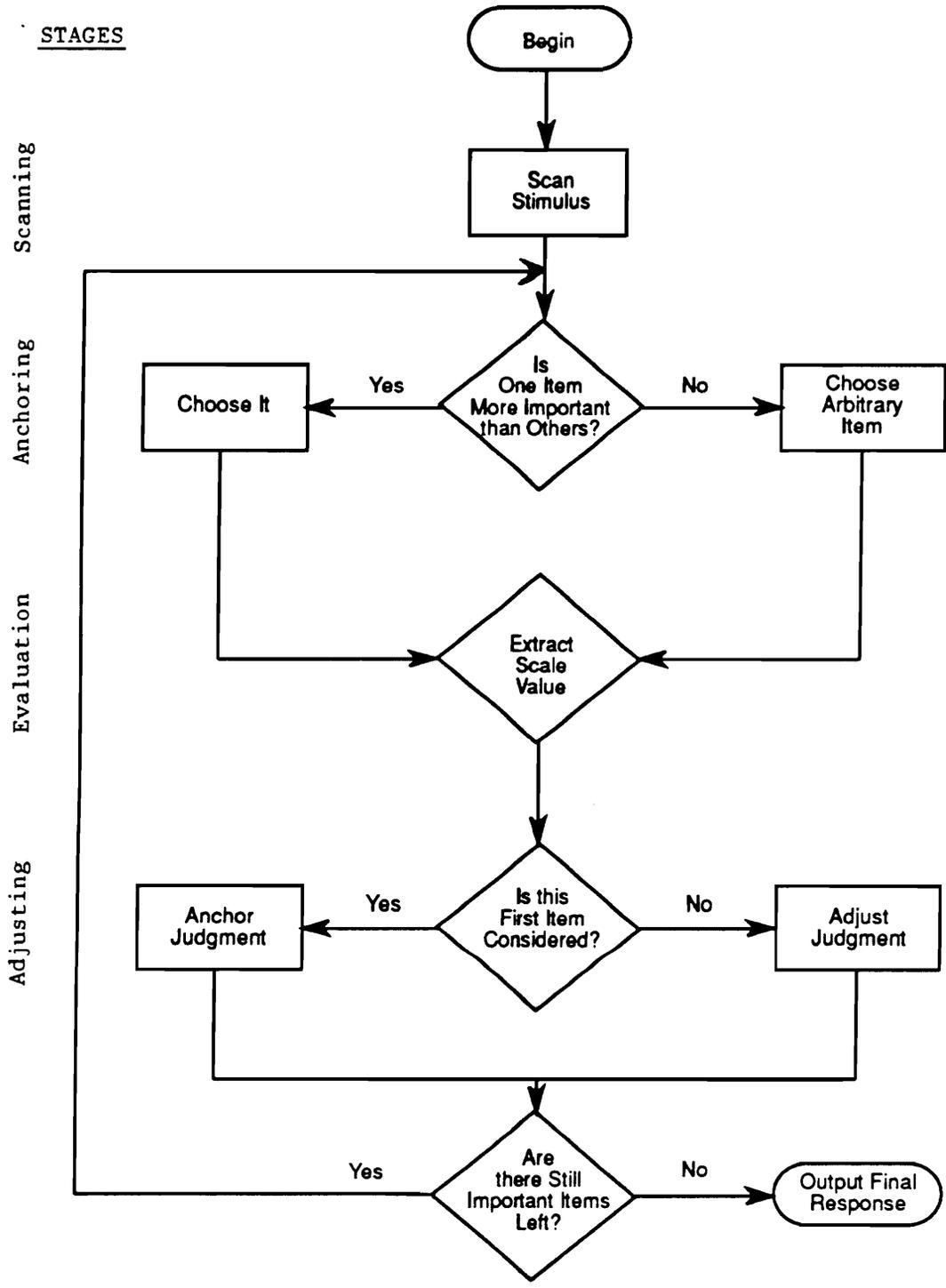


FIGURE 5. FLOW DIAGRAM OF THE SERIAL ADJUSTMENT PROCESS

mation is perceived to be undifferentiated, the decision maker scans the information as it meets the eye. Depending upon the information format, scanning may occur (for example) from left to right or top to bottom. Differentiated information, in contrast, is usually scanned in a sequence that may be quite different from the presentation format. While scanning such information, the decision maker is not guided by the presentation format but establishes his or her unique information acquisition strategy.

Anchoring

Lopes proposed that the scanning stage is followed by anchoring. During this stage, the decision maker focuses on one specific information element to initiate the evaluation process. The question is which information element will get precedence. Lopes proposes several factors that may be operative in this anchor selection process.

First, perceived importance of information can play an important role. That is, the decision maker may choose to initiate the evaluation process by focusing on an information element that is perceived to be important. Second, an anchor may be selected on the basis of its diagnosticity. The implicit assumption here is that information elements provide different degrees of diagnostic insight about a criterion outcome. For example, GMAT scores may be perceived as more indicative of potential success in graduate studies than educational background. Third, sometimes salience itself may determine the anchor's selection

(e.g., using an information element as an anchor simply because it was seen first). Finally, information that first comes to one's mind may also be used as an anchor.

Note that this stage pertains only to the anchor's selection and not its evaluation. For example, you may choose to use GMAT score to assess an applicant's aptitude for graduate studies; this would be referred to as anchor selection. However, evaluation of the GMAT score ("it is poor") is made subsequently and is not considered a part of the anchor selection stage. The evaluation stage is described next.

Evaluation

Here the information element selected as the anchor may be processed further to provide a starting point (i.e., an anchor assessment) for the judgment or decision task at hand. Basically, the purpose is to go from information to some form of an appropriate interpretation of that information.

Consider, once again, the situation where you are evaluating applications for graduate admission. Choosing to focus on a candidate's GMAT score indicates that the score is being used as an anchor. During the evaluation stage, the GMAT score is processed further to yield an interpretation that can aid the decision process. Lopes refers to this process of interpretation as extracting the anchor's scale value. What scale value should be extracted from the GMAT score in order to aid the decision process? Given that the admission applications are for graduate school,

a useful inference that can be drawn from the GMAT score could be the potential of success in graduate studies. Once the inference has been made, it serves as the anchor assessment to initiate the judgment or decision process.

In most circumstances, it will be necessary to process the anchor information to yield a useful starting point. The extent and type of processing will usually depend upon the nature of the judgment or decision task. However, there will also be situations where the anchor information itself suggests a useful starting point (i.e., anchor assessment). In such circumstances, little or no information processing may be necessitated. For example, consider the situation described earlier where your task was to predict what the Dow Jones Average will be in about three months' time. As was indicated earlier, the current Dow Jones Average may be employed as an anchor to initiate the prediction task. In this situation, it is not necessary to process the anchor information any further. The anchor information itself (e.g., 2270) will be used directly to initiate the prediction task.

Adjustment

In the process described until this point, three major activities have been completed: 1) information scanning, 2) anchor selection, and 3) anchor evaluation. Now the decision maker proceeds to examine and evaluate subsequent pieces of information. This examination and evaluation process is then used by the decision maker to adjust the initial anchor

assessment. This adjustment takes place in an incremental manner; as each additional piece of information is examined and evaluated, a "running score" of the assessment is maintained and adjusted.

Some of the points made above in the context of scanning and evaluation also apply to the adjustment stage. As mentioned earlier, the scanning order may not follow the information presentation format. Instead the decision maker may choose to examine the information in a manner that reflects his or her priorities or preferences. This selective treatment of information also continues during the adjustment stage. Regarding evaluation, recall that anchor information had to be processed before it could yield a useful starting point to initiate the judgment or decision task. Similarly, as the decision maker encounters more information after the anchor, there may be a need to process that information further before it can guide the adjustment process.

The decision maker continues to examine and evaluate information and make corresponding adjustments till the decision maker is satisfied that sufficient information has been processed. Lopes points out that the type of adjustment can take several forms. The basic purpose of the adjustments, of course, is to incorporate the impact of new information on assessments that have already been made.

Depending upon how the new information is interpreted or evaluated, existing assessments may be adjusted either upward or down. In tasks of an evaluative nature where a good/bad or a favorable/unfavorable type of assessment has to be made, Lopes indicates that adjustments approximate a sort of averaging process. That is, assessment after the adjustment lies

between the old assessment and the assessment implied by the new piece of information.

Another type of adjustment is identified by Lopes as serial fractionation. In this type of adjustment, the magnitude of adjustment is always a constant proportion of the existing assessment. The direction of the adjustment, however, can be either up or down.

Processing of Non-Numerical Information

The anchoring and adjustment model, as described above, may seem to imply that the decision maker should have access to some numerical information (i.e., numbers) in order to use such a heuristic. After all, it is quite intuitive to think of anchoring and subsequent adjustments to have numerical overtones ("Let's start with say 6 on a scale of 0 to 10 ..."). Lopes, however, argued very persuasively that humans can comfortably manipulate non-numerical information. For these reasons, Lopes contended that her anchoring and adjustment model applies equally well to situations where decision makers do not have numbers to initiate the judgment or decision process. As Lopes puts it, the anchoring and adjustment heuristic need not be numerically instantiated.

As an illustration of how an anchoring and adjustment strategy may be employed with no numerical overtones, consider Figure 6. The example shown in the figure is similar to the situation usually studied in impression formation research. Three adjectives describing a hypothetical person are shown to a subject who is required to examine and evaluate the

adjectives and form an impression about the hypothetical person. The figure shows the type of thoughts that may indicate an anchoring and adjustment strategy. The second column identifies stages of the anchoring and adjustment process as the subject proceeds with his/her impression formation task. The third column shows how impression is sequentially formed.

Summary. The discussion presented above focused on process details of the anchoring and adjustment heuristic. Lopes' (1982) model of this heuristic identifies four stages in the underlying process: 1) scanning, 2) anchoring, 3) evaluation, and 4) adjustment. The scanning stage orients the decision maker to the information available in a judgment or decision task. Anchor selection occurs during the anchoring stage. Perceived importance, saliency, and diagnosticity are some factors that can influence anchor selection. The anchor information is interpreted and/or evaluated during evaluation stage. Subsequently, during the adjustment stage, adjustments are made to the initial anchor assessment as the decision maker examines and evaluates more pieces of information. The magnitude and direction of the adjustments can take different forms and depend on the type of judgment/decision task. Finally, it should be noted that the anchoring and adjustment heuristic is suited for processing both numerical and non-numerical information. The next section reviews evidence in support of anchoring and adjustment. A model of bundle evaluation based on anchoring and adjustment notions is then developed.

THOUGHT	STAGE	VALUES
1. Let's see...gregarious, disorganized, imaginative...	Scanning	Impression = neutral
2. I'll start here with gregarious.	Anchor selection	
3. Ok. I really like gregarious people...	Valuation of anchor	Gregarious = very good
4. So that sounds like he'd be pretty good.	Anchoring	Impression = good +
5. Ok. What's next.	Stimulus selection	
6. Uh oh. Disorganized isn't too good.	Valuation of second item	Disorganized = not too good
7. That lowers the person quite a bit.	Adjustment for the second item	Impression = above average
8. Ok. Now imaginative...	Stimulus selection	
9. That's good usually...	Valuation of the third item	Imaginative = good
10. So it helps.	Adjustment for the third item	Impression = fairly good

Source: Lopes (1982)

FIGURE 6. ANCHORING AND ADJUSTMENT IN IMPRESSION FORMATION

Evidence Supporting the Anchoring and Adjustment Heuristic

Evidence supporting the anchoring and adjustment heuristic comes from a wide variety of sources. The purpose of this section is to present that evidence. For the sake of exposition, the evidence is discussed under two sub-headings: 1) non-probabilistic and 2) probabilistic studies. The essential difference in these two types of studies concerns the role of probability. In non-probabilistic studies, probability information is not presented explicitly to the subjects. Probabilistic studies, however, did require subjects to process probability information.

Non-Probabilistic Studies

Bias Caused by Anchor. The earliest empirical evidence indicating support for the anchoring and adjustment heuristic was reported by Tversky and Kahneman (1974). In one of the experiments conducted by the authors, two groups of subjects were required to guess the percentage of African countries represented in the United Nations. Each group was provided an arbitrary starting percentage estimate by spinning a "wheel of fortune." Subjects were then instructed to guess the percentage of African countries by indicating a number that was either more or less than the arbitrary estimate provided to them.

The median estimate of the first group that received an arbitrary starting percentage of 10 was 25. The corresponding estimate for the

second group (arbitrary starting percentage 65) was 45. Hence the arbitrary starting estimate (which normatively should have no effect) substantially influenced the subjects' final responses. Tversky and Kahneman reasoned that, in the absence of any additional information, subjects tended to use the arbitrary starting estimate as anchor estimate. Although both groups did make adjustments to the anchor estimate, the final response was nevertheless still biased towards the anchor estimate. The actual magnitude of this bias, however, was not indicated in the paper.

In another experiment, Tversky and Kahneman (1974) asked their subjects to complete a multiplication task under time pressure. One group of subjects were asked to estimate the end result of $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$. The second group estimated $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$. The median estimate of the first group was 2250, while the median response of the second group was 512. (The correct answer is 40,320.) The authors provided an anchoring and adjustment explanation for the obtained results. According to that explanation, both groups approached the estimation task by multiplying the first few numbers and then (under time pressure) adjusting upward. The group with the descending series ($8 \times 7 \times 6 \dots$) would thus obtain a larger initial estimate than the other group. As adjustments normally tend to be insufficient, the authors reasoned, the final response would be biased towards the anchor estimate. Hence, the descending series task would result in a higher estimate.

In an experiment quite similar to those reported above, Joyce and Biddle (1981) found that even experienced auditors are subject to bias

while using the anchoring and adjustment heuristic. Two groups of subjects were asked to estimate the degree of fraud usually encountered by the Big Eight accounting firms. Before they made their estimate, however, subjects in one group indicated agreement with one of these two statements:

Yes, more than 10 in each 1,000 Big Eight clients have significant executive-level management fraud.

No, fewer than 10 in each 1,000 Big Eight clients have significant executive level management fraud.

The second group responded to similar statements except that the phrase "10 in each 1000" was changed to "200 in each 1000."

Normatively, responding to statements of this nature should not influence the subjects' final estimate of fraud. However, consistent with the anchoring and adjustment heuristic, mean estimates of the two groups were statistically different. The first group (which had the phrase "10 in 1000" in its statements) estimated fraud to be 16.52 per 1000. The second group's mean estimate was 43.11 per 1000. These differences were explained by arguing that subjects anchored on the (normatively inappropriate) figure mentioned in the statements. The first group anchored on 10 per 1000, while the second group anchored on 200. Because final responses are usually biased in the direction of the anchor assessments, the second group's estimate of fraud was greater than the first group's.

Heuristic's General Purpose Nature. Anchoring and adjustment has also been used to explain how people go about predicting their spouses' preferences for new product concepts (Davis, Hoch, and Ragsdale 1986). Sub-

jects were shown 20 new product concepts. Then, for each product concept, they tried to predict their spouses' preferences. The theoretical argument was that subjects would use an anchoring and adjustment strategy to make such predictions. Also, the argument continued, one's own preference is most salient to an individual and also easily available in memory. Hence, subjects are most likely to use their own preferences as an anchor to initiate the prediction task. Starting with this anchor prediction, adjustments would subsequently be made to arrive at one's final prediction.

Results of the study indicated that the anchoring and adjustment model provided a good description of the prediction strategy used by subjects. The model explained about 54% of the variance in the subjects' predictions. However, it was also found that subjects', in general, fared poorly in predicting their spouses' preferences for new product concepts. The anchoring and adjustment model explained a poor 12% of the variance in the spouses' actual preferences.

The prediction task described above is one indication that the anchoring and adjustment heuristic is applicable in a wide variety of judgment and decision contexts. Further support for the heuristic's general-purpose nature comes from examining the algebraic models developed and tested in the context of information integration theory (Anderson 1981). This stream of research has shown that human judgment can be frequently expressed in the form of simple algebraic models. Furthermore, these algebraic models are known to take averaging, additive, or multiplicative forms.

For example, research on impression formation (see Anderson 1981) has sought to determine how people process personality information to form impressions. A common method employed in several of these studies involves showing a list of adjectives (e.g., gregarious, honest, pleasant) describing a hypothetical individual to a group of subjects. After examining the adjectives, subjects are asked to indicate their overall (favorable/unfavorable) impression about the hypothetical individual. It has been shown that the overall impression can be expressed as the average favorable or unfavorable nature of the individual adjectives.

Lopes (1982) points out the important distinction (and connection) between the algebraic models of human judgment and the process models of human judgment. She argues that although human judgment can be frequently expressed in algebraic form, it does not imply that humans form judgments algebraically. Instead, it appears that judgments are formed using some simple cognitive processes that happen to have algebraic representations. The anchoring and adjustment heuristic appears to be one such underlying process in several judgment tasks (Johnson and Puto 1987; Lopes 1982).

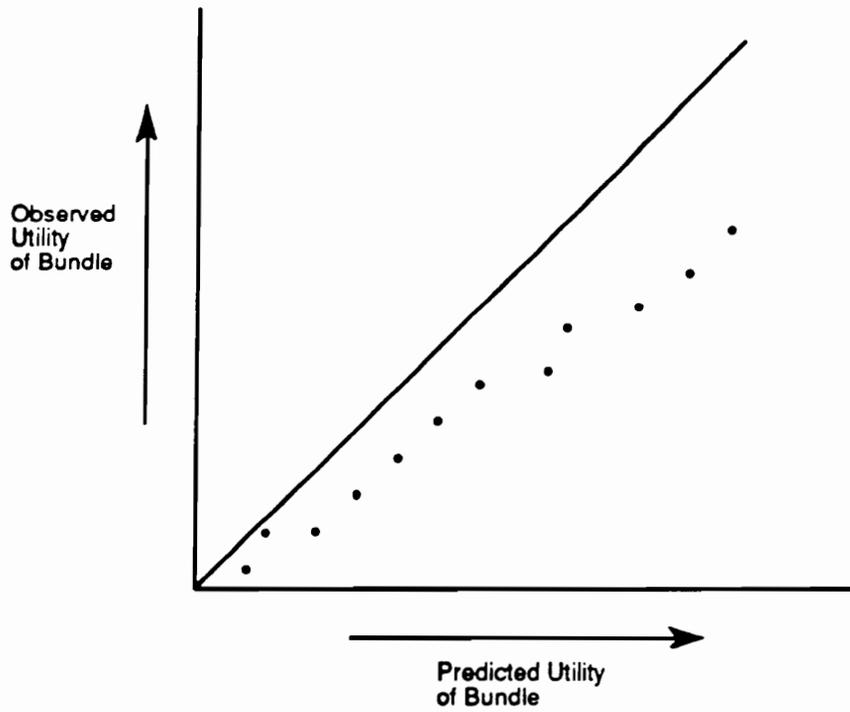
Product Evaluation. Shanteau and Phelps (1979) uncovered some interesting results that suggest the presence of an anchoring and adjustment strategy in making product evaluations. Their aim was to test empirically the so-called additivity of utility assumption. This assumption, frequently encountered in economic analyses, asserts that the utility of a group of goods is simply the sum of the individual goods' utilities. Shanteau and Phelps tested this assumption by measuring their subjects' preferences

for individual products as well as group of products. They found that given any two products A and B, utility (measured as degree of preference) of A and B together was consistently less than indicated by the additivity assumption. In other words, the authors demonstrated evidence for subadditivity of utility rather than additivity.

Figure 7 shows their subadditivity results graphically. The horizontal axis indicates that utilities predicted by the additivity assumption, whereas the vertical axis represents the observed utilities. The solid line drawn through the origin represents the trend suggested by the additivity assumption. The dotted line shows the results actually obtained in the empirical investigation. As the dotted line consistently lies below the solid line, it indicates that utilities (measured as degree of preference on a 0 to 100 scale) were combined by subjects in a subadditive manner.

Specifically, the study indicated that observed utility was (on average) about 25% less than the predicted utility. Shanteau and Phelps (1979) also reanalyzed the results of studies similar to theirs and found comparable degrees of subadditivity (8% to 29%). The reanalyzed studies dealt with a wide variety of situations, ranging from assessing extremity of psychiatric symptoms and traffic violations (Hicks and Campbell 1965) to indicating preference for gifts (Thurstone and Jones 1957).

Shanteau and Phelps (1979) found the prevalence of subadditive results quite intriguing and suggested several theoretical explanations for the so-called subadditivity phenomenon. Of these explanations, the authors argued that invoking anchoring and adjustment as the underlying



Source: Adapted from Shanteau and Phelps (1979)

FIGURE 7. SUBADDITIVITY OF UTILITY

evaluation strategy was the most plausible. According to this argument, subjects assess their degree of preference for a group of products (e.g., products A and B together) by using an anchoring and adjustment strategy. They first assess the degree of preference for one of the products and use this preference as a starting point--that is, as an anchor preference. Subsequently, when preference is also determined for the second product, (positive) adjustments are made to the initial anchor preference. Adjustments to the initial anchor preference hence yield the final response (degree of preference). As adjustments are usually insufficient while using the anchoring and adjustment heuristic, preference for a group of products is characterized by subadditivity.

Shanteau and Phelps (1979) acknowledged that their subadditivity results may look very much like the traditional diminishing marginal returns in economics. However, to show how their results are different, they argued that it is essential to make a distinction between value generation and value combination. Whereas value generation refers to assessing the incremental value of an additional commodity, value combination pertains to the integration of those incremental values. Value generation, they argued, is subject to diminishing marginal returns as suggested in economics. In the value combination stage, these diminishing returns (values) are combined in a subadditive manner. In a subsequent empirical test of this assertion, Shanteau and Troutman (1979) provided evidence in support of these arguments.

In conclusion, the distinction between diminishing marginal returns and subadditivity may be problematic, but Shanteau and his colleagues

provide several interesting perspectives on this issue. In the context of bundle evaluation, their anchoring and adjustment explanation also is thought provoking. Because the authors' analysis pertains to a group of products, it's relevance to bundling situations needs to be explored. Later in this chapter, these ideas will be pursued further to develop this dissertation's conceptualization. Before that, however, the next section presents further evidence supporting the anchoring and adjustment heuristic. This time the focus is on those studies which explicitly required their subjects to process probability information.

Probabilistic Studies

This dissertation's primary focus being on the evaluation of bundles (a non-probabilistic task), empirical evidence from probabilistic studies will be discussed only briefly. In discussing the probabilistic studies, the purpose is to illustrate the wide variety of judgment contexts in which the anchoring and adjustment heuristic is applicable.

Probability Assessments. To present the role that the anchoring and adjustment heuristic plays in probability assessments, consider the distinction between conjunctive and disjunctive events. To illustrate this distinction, imagine a box filled with balls that are (for example) half white and half red. Now suppose that you pick five balls randomly from the box. Selecting five red balls in succession is one example of a

conjunctive event, selecting at least two red balls (in a total of five selections) illustrates the nature of a disjunctive event.

A common finding in research on probability assessments is that people tend to overestimate the probability of conjunctive events and underestimate the probability of disjunctive events (Tversky and Kahneman 1974). Tversky and Kahneman argued that this under- and over-estimation can be explained in terms of the bias caused by the anchoring and adjustment heuristic. While making probability estimates of conjunctive and disjunctive events, people tend to start the estimation process by anchoring on the probability of a so-called elementary event. In the context of a conjunctive event involving the selection of five red balls in succession, for example, a single random selection of a red ball is an elementary event. Therefore, in estimating the probability of selecting five red balls in succession, a person might first focus on the following question: What is the probability that a random selection from the box is going to be red?

Hence estimating the probability of a conjunctive or disjunctive event begins with estimating the probability of a relevant elementary event. Subsequently, following the anchoring and adjustment heuristic, adjustments are made to the initial probability assessment of the elementary event. However, adjustments are typically insufficient and hence the final probability estimate tends to be biased towards the elementary events estimated probability. But how does this translate into over and under estimation of probability for conjunctive and disjunctive events respectively?

This bias occurs because the probability of a conjunctive event is always less than the probability of any one of its elementary events (e.g., probability of selecting five red balls in succession is less than the probability that a random selection will turn out to be red). Similarly, probability of a disjunctive event is always more than the corresponding elementary event's probability. Adjustments, in anchoring and adjustment, tend to be in the right direction (negative for conjunctive events and positive for disjunctive events). However, as indicated earlier, the magnitude of the adjustments is usually insufficient to arrive at the right answer. Because of these reasons, estimates of probability tend to be overestimated for conjunctive events and underestimated for events that are disjunctive. (See Joyce and Biddle (1981) for an empirical test of this assertion in the context of judgments made by experienced auditors.)

Using anchoring and adjustment arguments similar to the ones discussed above, Einhorn and Hogarth (1985) showed how people process probability information to make judgments of certainty and uncertainty. Judgment data, along with verbal protocols, indicated that people first anchor on specific probability information and then make adjustments for other relevant factors.

Finally, the anchoring and adjustment strategy has been used to explain judgment behavior in a wide variety of other probability-related tasks. Lopes (1982) showed that violations of Bayes' theorem occurred because the anchoring and adjustment heuristic sometimes leads to an inappropriate revision of probabilities. Also, it was shown that research

results on judging the worth of gambles (e.g., Shanteau 1974; Tversky 1967) could be readily explained in terms of an anchoring and adjustment process.

In sum, evidence obtained from non-probabilistic and probabilistic studies indicates that anchoring and adjustment strategies are frequently employed in a wide variety of judgment tasks. It was shown that use of this heuristic can lead to biased responses in both non-probabilistic and probabilistic tasks. Specifically, adjustments are usually insufficient and hence the final responses tend to be biased towards the anchor.

How Buyers Evaluate Bundles: Insights from Decision Research

This dissertation's goal, as indicated earlier, is to provide a theoretical account of the process used by buyers to evaluate bundle offers. With this emphasis on the evaluation process, questions of the following nature become relevant: How is information in a bundle offer examined by a buyer? In what order is the available information attended to? How is the acquired information processed and how does the evaluation process eventually lead to perceptions of value?

Before a statement can be made about how buyers process information while evaluating bundles, consider first the type of information that bundle offers present to buyers. Depending on how small or large the bundle is, this information can potentially be quite substantial. Consider, for purposes of illustration, a hypothetical pure bundling situation where a computer system is sold along with accessories. In the

context of this pure bundling offer, it is quite likely that a potential buyer may have to process information such as this:

- IBM compatible PC (640K RAM, Miniscribe 20MB hard disk)
- Name Brand monochrome monitor
- Epson printer (with graphics capability)
- Printer stand (strong structural design)

As can be seen in this example, the bundle offer is characterized by a relatively large amount of information. In a mixed bundling version of the above situation, sale price information about the bundle items may also be provided. Generally speaking, this is quite typical of many bundle offers. The question is how buyers will process this information. Also, is there any specific evaluative process that is suggested by the decision research reviewed above?

In order to answer this question, refer once again to the bundle offer described above. In order to evaluate the whole bundle, it appears essential that the buyer will have to examine and evaluate parts of the bundle. For example, in order to determine how good or bad the computer bundle is, the buyer may have to make evaluative assessments about some or all of the computer bundle's items. Because these assessments will be made in some order, the evaluation task appears to have a sequential structure. For evaluation tasks which can be decomposed into this type of a sequential "step-by-step" structure, anchoring and adjustment is a useful heuristic because it puts few demands on short-term memory (Lopes 1982). In addition, the heuristic allows larger amounts of information

to be processed iteratively simply be recycling through the process of 1) scanning, 2) anchoring, 3) evaluation, and 4) adjusting.

In conclusion it can be argued that, given the appropriateness of anchoring and adjustment for sequential evaluation tasks, this heuristic could provide a good description of how buyers evaluate items in a bundle offer. Note that the literature cited earlier in support of the anchoring and adjustment heuristic pertains primarily to the processing of attributes (e.g., assessing a graduate school applicant on the basis of attributes such as GMAT score, work experience, and quality of reference letters). In the context of bundle evaluation, the implicit argument is that the anchoring and adjustment heuristic is also appropriate for evaluating items in a bundle (e.g., assessing a computer bundle on the basis of its items: computer, monitor, printer, and printer stand). This analogical extension from the processing of attributes to the processing of items in a bundle appears reasonable because human judgment processes are usually general purpose--that is, characteristics of the same judgment process can often be found in different tasks (Johnson and Puto 1987; Lopes 1982).

Note that the anchoring and adjustment assertion is consistent with a similar conclusion reached by Shanteau and Phelps (1979). However, their conclusion was based on reasoning slightly different from the one stated above. As described earlier in this chapter, the authors' argument was that their study's subadditivity of utility results (implying that a bundle is frequently perceived to be less than the sum of its parts) could be best explained by proposing an anchoring and adjustment type of eval-

uation process. According to this argument, the observed subadditivity of utility is a result of insufficient adjustments in the anchoring and adjustment process.

The sequential nature of the bundle evaluation task and Shanteu and Phelp's subadditivity results therefore suggest that the underlying process in bundle evaluation could be anchoring and adjustment. In addition, the literature review presented above indicates that the anchoring and adjustment heuristic may be operative in a wide variety of judgment tasks. For these several reasons, this dissertation's primary thesis is that buyers evaluate bundle offers using an anchoring and adjustment evaluation strategy. Details of this strategy are now presented in the context of bundle evaluation.

Anchoring and Adjustment in Bundle Evaluation

Starting from the premise that buyers evaluate a bundle using an anchoring and adjustment strategy, this section develops the underlying process details of such a strategy. In this regard Lopes' (1982) general model of anchoring and adjustment discussed earlier can be readily adapted to the bundling context. Recall that Lopes' model had four major stages: 1) scanning, 2) anchoring, 3) evaluation, and 4) adjustment. Details of these stages are discussed in the context of bundle evaluation (see Figure 8). For the purpose of exposition, reference will continue to be made to the computer example presented above.

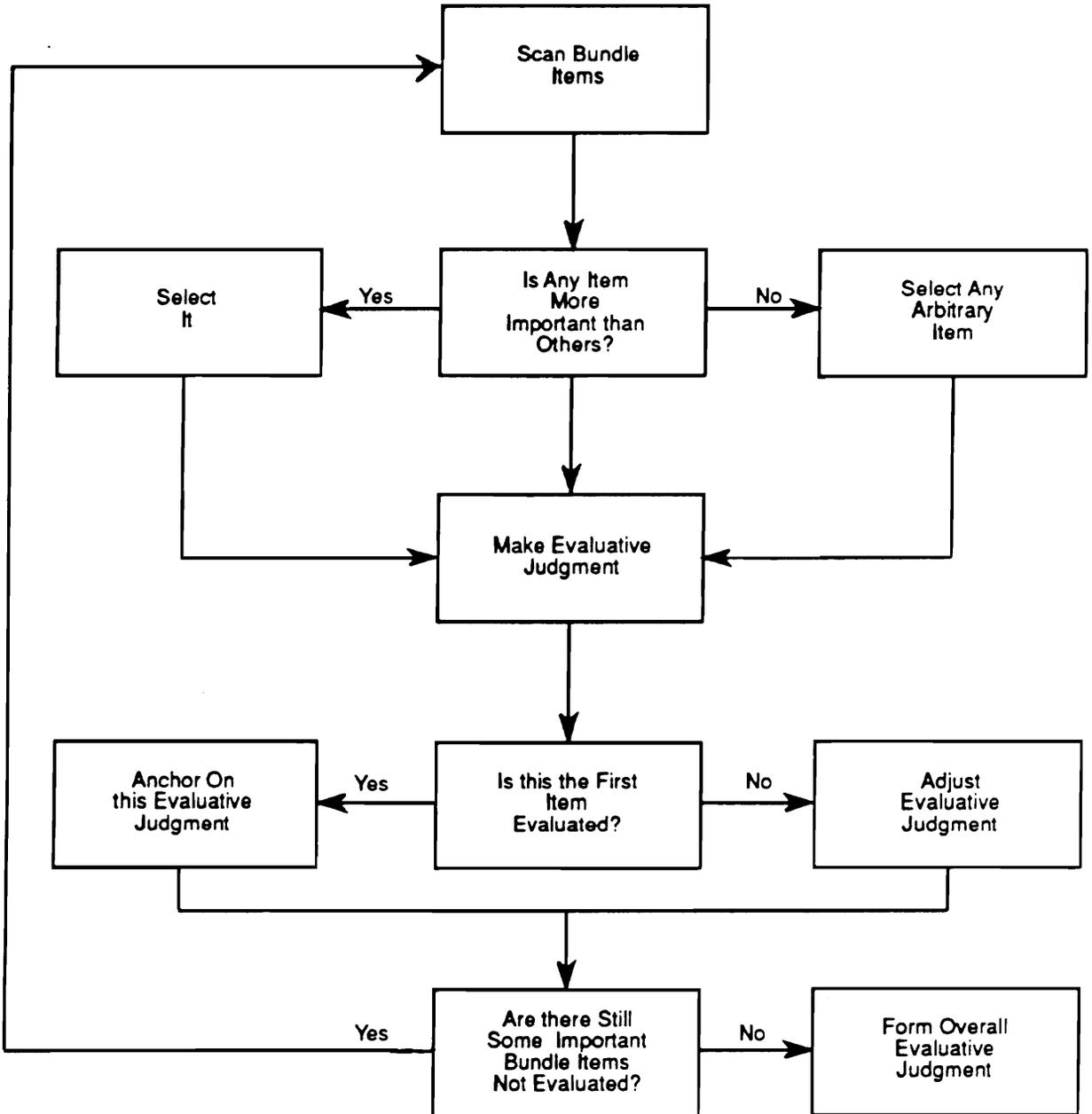


FIGURE 8. ANCHORING AND ADJUSTMENT MODEL OF BUNDLE EVALUATION

Scanning. In Lopes' general model, the purpose of this stage was to orient the decision maker to the available information. It was also indicated that the sequence of information acquisition can be influenced by the type of information. Specifically, information perceived to be undifferentiated is usually examined the way it's presented (e.g., top to bottom, left to right). This is because undifferentiated information elements, by definition, are perceived to be equally important to the evaluation task. Hence there is usually no incentive as such to scan the information in a specific sequence that is different from the presentation format. Differentiated information, on the other hand, is perceived to have different degrees of importance to the evaluation task. Information of this nature is therefore processed with a certain degree of selectivity; information perceived to be more important, salient, or diagnostic normally is examined first.

A similar scanning process can be expected during the initial stages of bundle evaluation. Depending on the type of bundling situation, information presented in a bundle offer can be either undifferentiated or differentiated. In the computer example presented above, it is quite likely that most buyers will perceive the information to be differentiated--the computer, printer, and printer stand will probably have different degrees of perceived importance. Most buyers may want to consider the computer first, followed by the printer and then the printer stand.

Anchoring. After the scanning stage has sufficiently oriented the buyer to the bundle items, s/he begins the evaluation process by focusing on one specific bundle item. Usually the bundle item to focus on would have been suggested by the scanning stage. In any case, bundle items perceived to be more important, salient, or diagnostic are likely to be focused on first during the anchoring stage.

Evaluation. During this stage, information about the anchor item is evaluated to yield an anchor evaluation. It is during this stage that the buyer's preferences and tastes play a major role. For example, two buyers may choose to anchor on the computer first but may begin the judgment process with very different initial evaluations. Whereas one buyer may find the 20MB hard disk to be an excellent feature, others may have no use for it. (Issues unique to the evaluation of price information are discussed momentarily.)

Adjustment. Evaluation of the anchor yields a starting point to evaluate the whole bundle. For example, evaluation of the computer bundle described above could begin by a positive evaluation of the anchor ("the computer looks really neat"). Once the anchor evaluation is made, the buyer proceeds to examine and evaluate other bundle items. Just as during the scanning stage, bundle items will be examined and evaluated in decreasing order of perceived importance, saliency, or diagnosticity. As each subsequent bundle item is examined, the existing evaluation is adjusted.

Regarding evaluation, this adjustment may be either positive, negative, or sometimes even zero. The direction and magnitude of adjustment will be determined by comparing the existing evaluation with the evaluation of subsequent items. In the computer example mentioned above, a poor anchor evaluation ("IBM clones are not reliable") may be followed by a superior assessment of the printer ("I've heard great things about Epson printers"). In this situation, the poor initial evaluation may be adjusted up to reflect Epson's superior assessment. Following this serial adjustment process, all subsequent bundle items are examined and evaluated. When the buyer is satisfied that sufficient information has been examined and evaluated, the evaluation process is terminated.

The Model. Using the ideas presented above, Figure 8 shows how buyers may evaluate bundles using the anchoring and adjustment heuristic. The figure is self-explanatory and is adapted directly from Lopes' (1982) general model of anchoring and adjustment.

As shown in the figure, the evaluation process begins by first scanning the bundle items. Based on perceived importance, saliency, or diagnosticity, the buyer first focuses on one bundle item. Assessment of this item yields the anchor evaluation. As subsequent bundle items are examined and evaluated, the initial anchor assessment is sequentially adjusted. These adjustments eventually result in the final evaluative judgment.

Assimilation-Contrast Effects in Bundle Evaluation

According to the Gestalt concept of outstandingness, some objects are more outstanding than others in that they have a greater ability to attract and retain one's attention. In the context of a product line, for example, the most expensive and least expensive products are said to be more outstanding than those between these two extremes (Monroe 1990, p. 304). Because they are more outstanding, evaluation of such products in a product line can influence perceptions of the entire product line (Petroshius and Monroe 1987).

A similar influence can be expected in the context of bundle evaluation. Typically the bundle offer will consist of several different products being sold together. If one or more of these bundle items is more outstanding than the others (as is quite likely), the gestalt concept of outstandingness suggests that evaluation of the more salient bundle item may influence evaluations of other bundle items.

Hovland and Sherif's (1961) assimilation-contrast theory may provide clues to the nature of this influence. This theory proposes that new stimuli are perceived relative to a latitude of acceptance; stimuli are either assimilated into the latitude of acceptance or contrasted away. In the context of bundle evaluation, this theory suggests that non-anchor items will be evaluated relative to the anchor evaluation. Assimilation effects, if they occur, will bias the evaluation of non-anchor items to-
wards the anchor evaluation; contrast effects will bias the evaluations away from the anchor evaluation.

Incorporating the Role of Price

In the theoretical development presented above no explicit reference has been made about the role of an important variable: price. Any attempt to understand how buyers evaluate bundles has to address the role of price for two primary reasons.

First, even in the context of single products, price is known to play a complex role in the evaluative processes used by buyers (Monroe 1973). Pure bundling, as defined earlier, involves the transaction of two or more products for a single price. Because multiple products are transacted for a single price, the evaluative role of price can be potentially even more complex than in the single-product situations. Hence a comprehensive theoretical account of how buyers evaluate bundle offers needs to focus explicitly on the role of price.

Second, from a managerial perspective, it is useful to know not only the processes used by buyers to evaluate bundles but also the price buyers will be willing to pay. Insights into issues of this nature can be obtained only if the role of price is addressed specifically in the theoretical account.

To incorporate the role of price in the conceptualization, refer once again to the computer bundle described earlier. For simplicity, that bundle is shown below again with the important difference that the bundle price is also indicated.

- IBM compatible PC (640K RAM, Miniscribe 20MB hard disk)
- Name Brand monochrome monitor

- Epson printer (with graphics capability)
- Printer stand (strong structural design)

PRICE: \$ 999

With the price information now included in the bundle description, the question is how it is going to be processed. The evaluation of non-price information is quite straight forward in that buyers, guided by their preferences, will interpret the available information. In the computer bundle, for example, a low opinion of Miniscribe hard disks will probably lower the evaluation of the IBM clone computer and the overall evaluation of the computer bundle. In other words, evaluation of the bundle's non-price information is the result of matching ones preferences with the bundle item's characteristics.

The unique nature of the price stimulus, however, suggests that it may be evaluated somewhat differently. In the computer bundle shown above, for example, what will a buyer make of the \$999 price? Obviously, some natural questions of concern may be: Is \$999 a good price? Is it too high? Too low? All these questions suggest that the evaluation of price information needs a point of comparison. For example, if the \$999 price is indeed good, it is good compared to what? In other words, buyers have no simple preferences for price.

The reviewed decision literature, unfortunately, provides no useful answers to questions of this nature. To help answer some of these questions and to eventually incorporate the role of price explicitly in the anchor and adjustment conceptualization, the next section will review some pertinent research on the role of price in product evaluation.

THE ROLE OF PRICE IN BUNDLE EVALUATION

This section focuses on how the price information is processed when a buyer examines and evaluates a bundle offer. The primary conceptual theme developed here is that price 1) serves as a valuable source of information and 2) plays an important role in the formation of value perceptions.

Dual Roles of Price: Information and Value

To motivate the discussion of the behavioral approaches presented below, consider first the role of price as developed in traditional economic theory. Marshall's (1948) demand theory, sharing the characteristic of economic analyses in general, begins with several assumptions about individual buyer behavior. One such assumption is the so-called perfect information assumption, according to which buyers have perfect information about all products in the market. That is, they have full knowledge about the products and their characteristics. Also, buyers are assumed to know perfectly their own preferences and tastes. Purchase behavior is then modeled by imposing an income constraint and arguing that each individual buyer will seek to maximize his or her utility.

In a theoretical framework such as this, price is implicitly assumed to play a relatively minor role. Specifically, because of the income constraint, buyers are assumed to think of price only in terms of monetary sacrifice. However, starting with Scitovszky (1945), several researchers

have argued for a significantly expanded role for the price variable. Furthermore, assumptions of Marshallian demand theory have found poor empirical support. In contrast to the theory's perfect information assumption, for example, buyers' information processing limitations have been well documented (Jacoby, Speller, and Kohn 1974; Malhotra 1982; Summers 1974; Wilkie 1974). Also, some of demand theory's key assertions have been violated (e.g., Giffen goods for which demand and price are positively related).

Unrealistic assumptions and violations of key theoretical assertions are just some of demand theory's shortcomings. More importantly the theory's analytical framework makes almost no mention of the actual processes used by individual buyers to evaluate commercial transactions. Although Nagle (1984) argues that economic analyses are not meant to explain individual-level processes, that does not diminish demand theory's shortcomings. Recognizing that important insights can be obtained by focusing specifically on individual behavior, recent developments in pricing research have a strong behavioral orientation.

Price-Perceived Quality Inferences. As indicated above, economic theory construes price primarily as an index of monetary sacrifice. However, Scitovzky's (1945) conceptual arguments and empirical evidence collected during the 50s and 60s (e.g., Leavitt 1952; Tull, Boring, and Gonsior 1964; Gabor and Granger 1966) seemed to indicate the price is frequently used as a cue to infer a product's quality. Many early studies investigating the so-called price-perceived quality relationship were single cue

studies; price was the only cue provided to the subjects. These studies were subsequently followed by multi-cue studies in which price was provided along with other product-related information. As it turned out, the price-perceived quality relationship was not as strong in the multi-cue studies as compared to the single-cue studies. However, the collective evidence did indicate quite clearly that the role of price was more complex than an index of monetary sacrifice.

Monroe and Krishnan's (1985) model (see Figure 9) incorporates these dual roles of price: an index of monetary sacrifice and a cue about product quality. As shown in the figure, price may be used to make judgments of monetary sacrifice as well as product quality. Perception of value, it was hypothesized, is the end result of combining the negative impact of monetary sacrifice and the positive impact of perceived product quality. This conceptualization is consistent with the notion of an acceptable price range--when price falls outside this range, the monetary sacrifice of the transaction value exceeds the perceptions of quality and the price is not considered acceptable.

In subsequent tests and extensions of the Monroe and Krishnan model, good empirical support was reported for the basic conceptualization (Dodds 1985; Rao and Monroe 1986). In the past few years, however, several extensions and modifications have been made to the essential ideas contained in this conceptualization. Before these recent developments and their implications for bundle evaluation can be presented, it is necessary to introduce the concept of reference prices.

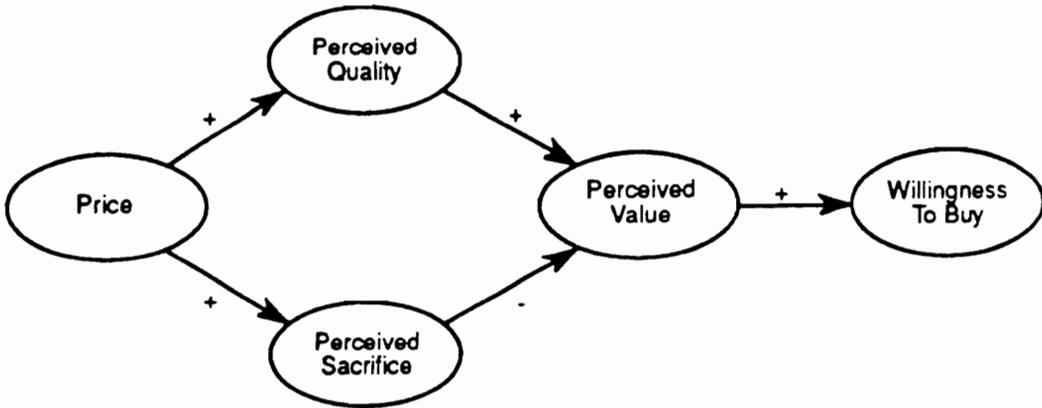


FIGURE 9. MONROE AND KRISHNAN MODEL

Reference Prices and the Formation of Value Perceptions

The purpose of this section is to develop ideas related to the use of price information in the formation of value perceptions. In the context of single-product offers, research on the formation of value perceptions has devoted considerable attention to the notion of the reference prices (Blair and Landon 1981; Lichtenstein and Bearden, 1989; Liefeld and Heslop 1985; Urbany, Bearden, and Weilbaker 1988; Winer 1987). Given the importance of this concept and its applicability to bundle offers, the next section provides a brief review of some pertinent research regarding reference prices. The discussion on reference prices provides an appropriate conceptual backdrop to Thaler's mental accounting model. Finally, insights from these discussions are used in addressing the issue of how value perceptions are formed in the context of bundle offers.

Reference Prices

There is a growing body of research which indicates that value perceptions are formed as a result of comparing the selling price of a commercial transaction to some type of an internal price standard (see references cited above). The basic idea that buyers typically compare the stated price of a product with a standard is in fact quite old and can be traced to Emery's (1970) notion of a standard or normal price. Developing Emery's ideas further, Monroe (1973) stated that the selling price of a product is usually compared with the internal standard represented

by the notion of the standard or normal price. He further pointed out that the standard or normal price may be an expected price, the last price paid or the average price of similar products. Also, it is not necessary for the standard price to be equivalent to the actual price of any specific product.

Given the relatively broad definition of a reference price as an internal standard, several alternative operationalizations have been proposed for the concept (Winer 1987). Winer presents some operationalizations mentioned in the literature such as "fair" price, price frequently charged, price last paid, reservation price, and price of the brand usually purchased. Instead of speculating on which operationalization best represents the concept, Winer suggests that the concept of a reference price is a multidimensional construct and each operationalization perhaps captures some aspect of the concept's conceptual domain.

Several theories pertaining to human perception in general are consistent with the concept of reference prices (Monroe 1971, 1973; Winer 1987; also see Klein and Oglethorpe 1987). According to the Weber-Fechner law of psychophysics, equal proportional changes in a stimulus result in equal changes in the response to the stimulus. Implicit in this law is the notion of comparison--changes in a stimulus are perceived relative to the present magnitude of the stimulus. Helson's (1964) adaptation level theory also reflects this common theme of comparison when it asserts that response to a particular stimulus depends upon the stimuli that immediately preceded that stimulus. In this theoretical account, an organism

is assumed to adapt at a certain level when exposed to a certain range of stimuli. When the organism is subsequently exposed to a new stimulus, that stimulus is perceived relative to the stimulus level the organism had adapted to.

In a similar vein, Hovland and Sherif's (1961) assimilation-contrast theory proposes that a new stimulus is perceived relative to a latitude of acceptance. The latitude of acceptance, in this context, serves as a sort of zone of comparison; new stimuli are either assimilated into the latitude of acceptance or contrasted away. And finally, Kahneman and Tversky's (1979) prospect theory explicitly incorporates the notion of a reference point in its conceptual development. In short, therefore, several theories support the central idea that the human perceptual system functions as a comparison device and that perception is usually relative to a point of comparison. Because reference prices serve as an internal standard of comparison, they are consistent with the theoretical accounts presented above.

Using the important ideas of reference prices and comparison processes, Thaler (1980, 1985) has proposed a theoretical account to explain how value perceptions are made in the context of commercial transactions. This theoretical account is now briefly described below and then subsequently employed to explain the formation of value perceptions in bundle offers.

Thaler's Mental Accounting Ideas

To present Thaler's essential arguments, a few preliminary definitions are needed. Thaler made a distinction between three quantities that can be expressed in dollar metric: value equivalent, reference price, and actual price. Generally speaking, value equivalent of a product is construed as a measure of its monetary worth. Specifically, if a person's value equivalent for a product is X dollars, then (by definition) the person would be indifferent between receiving X dollars or the product as a gift. Reference price of a product, in this conceptualization, is defined as the buyer's estimate of its fair price. Finally, actual price is simply the price at which a product is offered for sale.

Using these definitions, Thaler proposed two types of value perceptions that add up to constitute the overall perception of value for a commercial transaction. Acquisition utility and transaction utility, the two types of utilities identified by Thaler, were hypothesized to be a result of two comparison processes. Acquisition utility "depends on the value of the good received relative to the outlay," while transaction utility "depends solely on the perceived merits of the deal" (Thaler 1985; p. 205).⁵

To present this argument analytically, consider the following nomenclature:

⁵ Monroe and Chapman (1987) showed that this theoretical account is consistent with an extended version of the Monroe and Krishnan (1985) model. However, they used the term value in place of Thaler's utility.

P_V = value equivalent of a product
 P_r = reference price of a product
 P = actual price of a product
AV = acquisition value
TV = transaction value.

Then,

$$AV = V(P_V - P)$$
$$TV = V(-P_r: -P)$$

where the operator $V ()$ represents prospect theory's value function. Hence acquisition value is based upon a comparison of the sale price with the price the buyer is willing to pay for the utility. Transaction value, as modeled above, is based upon the comparison of the sale price with the buyer's internal reference price. Also,

$$\text{Perceived Value} = AV + TV.$$

Hence negative values of AV and/or TV will result in a reduction of perceived value; positive values will cause an enhancement. AV will be positive when P_V exceeds P (e.g., when \$20 is paid for a product that is valued at \$35); for situations in which $P_V < P$, AV will be negative. When P_r exceeds P , TV will be positive (e.g., when a product that is perceived to normally sell for \$50 is bought for \$40); TV is negative when $P_r < P$.

Empirical Support. Several empirical investigations have supported the essential argument that value perceptions are formed as a result of a comparison process. Specifically, buyers are assumed to compare the selling price indicated in a commercial transaction and compare it with an internal standard called the reference price (see Urbany, Bearden, and

Weilbaker 1988 for a process model of how external reference prices influence buyers' internal price standards).

If perceptions of value do indeed form as a result of comparing the stated price with the reference price, then any selling strategy that somehow inflates a buyer's reference price should lead to increased perceptions of value. Blair and Landon (1981) found that increasing the external reference price leads to increased perceptions of savings. However, results of several studies indicate that a seller's attempt to inflate the internal reference price are frequently not believed (Liefeld and Heslop 1985; Mobley, Bearden, and Teel 1988; Urbany, Bearden, and Weilbaker 1988). However, even in those situations where the seller-indicated prices are perceived by buyers to be exaggerated, there is some increase in perceptions of value (Urbany, Bearden, and Weilbaker 1988).

There is also evidence that buyers' internal reference price in a given purchase situation can be influenced by the context in which the purchase takes place (Lichtenstein and Bearden 1989). Two such contextual factors identified by the authors are: consistency and distinctiveness. Essentially the authors argued that a seller's claims of higher reference prices are not believed as much if the seller was known to frequently make such claims (high consistency). Also, claims of higher reference prices are less likely to be believed if several sellers make those claims (low distinctiveness).

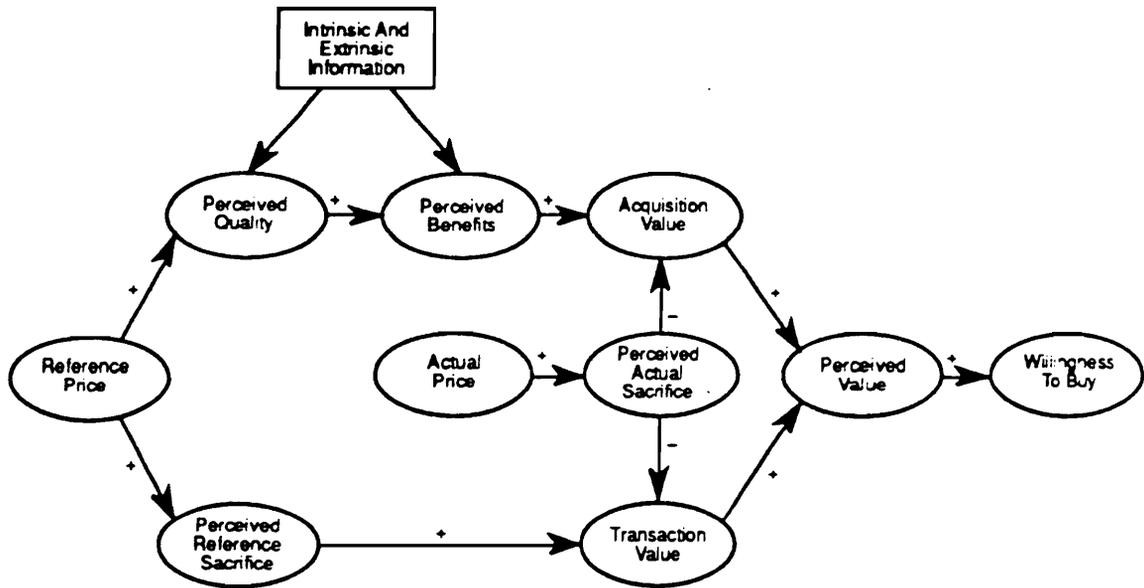
Results of the studies reported above constitute at least some tentative support for the concept of reference prices and their role in the

formation of value perceptions. These insights are now used in the next section to present an extended conceptualization of price and non-price effects in product evaluation. This extended conceptualization is then used in conjunction with the anchoring and adjustment ideas developed earlier to propose a conceptual model of bundle evaluation.

Extended Conceptualization of Price and Non-Price Effects

The arguments and evidence presented above focus on two broad issues: 1) the role of price in inferences about product quality, and 2) the role of reference prices in the formation of value perceptions. The extended model presented in Figure 10 integrates several ideas related to the role of price and non-price information in bundle evaluation. Constructs shown in the model are now defined.

1. Reference Price: the price buyers consider as the most likely price for the product being evaluated.
2. Perceived Quality: buyers' overall assessment of excellence in terms of performance regarding the product being evaluated.
3. Perceived Reference Sacrifice: buyers' perceived disutility of the monetary loss associated with the product's reference price.
4. Perceived Benefits: degree to which the product is perceived to perform a desired function, satisfy a need, solve a problem, and/or provide pleasure.
5. Actual Price: price at which the product is offered for sale.
6. Perceived Actual Sacrifice: buyers' perceived disutility of the monetary loss associated with the product's actual price.
7. Acquisition Value: buyers' perceived benefits of the product relative to its actual price.



Adapted from: Grewal (1989); Monroe and Chapman (1987)

FIGURE 10. THE ROLE OF PRICE AND NON-PRICE INFORMATION IN PRODUCT EVALUATION

8. Transaction Value: buyers' perception of savings associated with purchasing the product at its actual price.
9. Perceived Value: buyers' overall evaluation associated with purchasing the product at its actual price.
10. Willingness to Buy: buyers' behavioral disposition to purchase the product.

As shown in the figure, the reference price of the product is used to make inferences about product quality. In addition, the magnitude of the reference price also serves as an index of perceived reference sacrifice. The figure makes a distinction between perceptions of quality and perceptions of benefits, reflecting Zeithaml's (1988) argument that these two constructs need to be separated. Perceived benefits, in turn, are influenced by two types of non-price information: extrinsic and intrinsic. Based on the dichotomy of intrinsic and extrinsic cues (Grewal 1989; Olson 1977; Olson and Jacoby 1972; Zeithaml 1988), intrinsic information involves the physical composition of a product and cannot be changed without changing the product (e.g., flavor of a beverage, processing speed of a computer). Extrinsic information, by definition, is external to or outside the product. This type of information is related to the product but is not a part of the physical product itself (Zeithaml 1988).

The actual selling price of a product serves as an index of monetary sacrifice. This perception of sacrifice, as shown in Figure 10, influences perceptions of acquisition and transaction value; these values, in turn, influence perceptions of value and willingness to buy.

CONCEPTUAL MODELS OF BUNDLE EVALUATION

In this section, two conceptual models focusing on the evaluation of bundles are proposed: 1) a model of the bundle's acquisition value and 2) a model of the bundle's transaction value. The importance of the constructs acquisition value and transaction value was documented in the conceptual arguments presented above. The two models developed in this section represent an integration of ideas presented up to this point in the dissertation's conceptual development.

Model of Bundle's Acquisition Value

Conceptually, acquisition value was defined in an earlier section as "the value of the good received compared to the outlay" (Thaler 1985, p. 205), though Thaler used the term utility instead of value. In other words, this perception of value represents a comparison of what is perceived to be obtained in a transaction with what is given up. In a transaction involving the purchase of a bundle, two or more items are exchanged for a certain monetary amount. Therefore, the model of acquisition developed below focuses on two aspects of the evaluation process: 1) the processing of non-price information about the bundle items to assess the worth of what is received, and 2) the processing of price information to assess the sacrifice it represents. These two aspects of the evaluation process are now described.

Influence of Non-price Information

The upper portion of Figure 11 shows how the anchoring and adjustment process influences perceptions of bundle quality and benefits. The essential argument is that items constituting the bundle are examined and evaluated using an anchoring and adjustment process. Details of the process were presented in earlier sections of this chapter.

Briefly, the proposed process is sequential in nature and entails anchoring on a bundle item that is perceived to be either the most important, salient, or diagnostic of bundle worth. Once the anchor item is evaluated, that evaluation then serves as an initial evaluation for the whole bundle--that is, as a starting point. As other bundle items are subsequently examined and evaluated, incremental adjustments are made to the initial anchor evaluation. These incremental adjustments, as argued earlier, have the characteristics of a weighted averaging process. This process of incremental adjustments continues until the buyer is satisfied that sufficient item-related information has been examined and evaluated.

Influence of Price Information

The relationships shown in the lower section of Figure 11 focus on the effects of price information on various perceptions about the bundle. This part of the model is similar to the one shown in Figure 10 which integrates the role of price and non-price information in product evaluation. The major difference between the two figures is that the constructs shown in Figure 11 pertain to a bundle consisting of two or more

Influence of Non-Price Information

Influence of Price Information

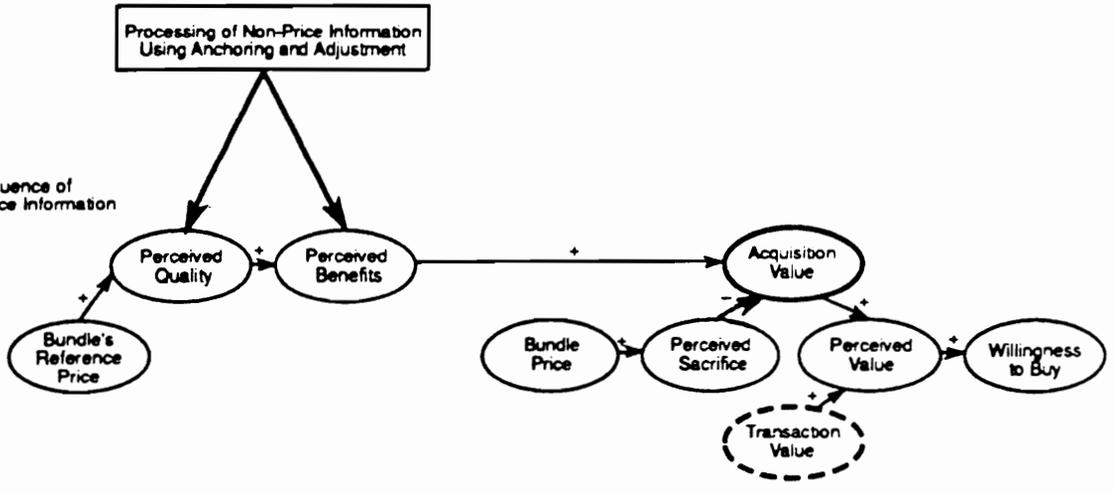


FIGURE 11. CONCEPTUAL MODEL OF BUNDLE'S ACQUISITION VALUE

products. Definitions of these constructs, based on or adapted from Chapman (1987), Grewal (1989), and Zeithaml (1988), are now presented.

1. Bundle's Reference Price: the price buyers consider as the most likely price for the bundle being evaluated.
2. Perceived Quality: buyers' overall assessment of excellence in terms of performance of all the bundle items considered together.
3. Perceived Benefits: degree to which the bundle is perceived to perform a desired function, satisfy a need, solve a problem, and/or provide pleasure.
4. Perceived Sacrifice: buyers' perceived disutility of the monetary loss associated with the bundle price.
5. Acquisition Value: buyers' perceived benefits of the bundle relative to the bundle's perceived sacrifice.
6. Perceived Value: buyers' overall evaluation of the bundle offer.
7. Willingness to Buy: buyers' behavioral disposition to purchase the bundle.

As shown in Figure 11, the bundle's reference price is used to make inferences about bundle quality. The specific nature of such inferences will of course depend on the type of price information presented in the bundle offer. A pure bundling situation that presents only the overall bundle price (e.g., products A and B selling for the overall bundle price of \$100) conceals the prices of individual bundle items--the buyer does not directly know the prices being charged for the individual products A and B. In a mixed bundling situation, however, prices on the individual items are also provided along with the overall bundle price.

In the mixed bundling situation, the nature of price-perceived quality inferences is quite straightforward. Essentially it is expected that when the individual bundle items are being examined, price information of the items may be used to make price-perceived quality inferences.

Such price-perceived quality inferences may then be compared with quality inferences based on the non-price information. If the two inferences are consistent, uncertainty about the items' quality may be reduced. In contrast, inconsistent inferences may increase the uncertainty regarding the items' quality.

Although price-perceived quality inferences can also occur in pure bundling contexts, the nature of these inferences can be slightly different from that described above for a mixed bundling situation. These differences may occur because the type of price information presented in the two bundling situations is different. In the pure bundling case, if the only price information provided to the buyer is about the overall bundle (instead of about the individual items), price-perceived quality inferences (if any) may have to be made using this information. The concept of the acceptable price range was developed above for the case of single products. If buyers have acceptable price ranges for the individual items in a bundle, then (if the buyer so desires) an acceptable price range can also be estimated for a bundle.

Consider, for example, a bundle (consisting of products A and B) being offered at a price of \$100. If a buyer's acceptable price range for A is \$60-\$80 and \$30-\$40 for product B, then the acceptable price range for the complete bundle may fall somewhere between \$90 ($60+30$) to \$120 ($80+40$). If adding products A and B in a bundle either enhances or diminishes their individual acceptable price ranges, then the acceptable price range of the bundle could of course be quite different from the \$90 to \$120 range indicated above. The essential argument being presented here

is that, while evaluating a bundle in a pure bundling context, a buyer may make price-perceived quality inferences (about the bundle) by comparing the bundle's reference price with the bundle's acceptable price range.

For example, if the bundle's reference price is perceived to be below the bundle's acceptable price range, then it may be concluded that the quality of the bundle's items is not good. Such inferences, good or bad, may then be compared with quality inferences based on the non-price information pertaining to the bundle items. The upper section of the model shows how the anchoring and adjustment process (using non-price information) influences perceptions of bundle quality and benefits.

As shown in the model (Figure 17), perceptions of quality positively influence perceptions of benefits obtained from the bundle. The positive influence of perceived benefits and the negative influence of perceived sacrifice jointly determine acquisition value. Acquisition value and transaction value (shown with dashed lines) jointly determine the perceived value of the bundle; details of how transaction value is formed will be presented momentarily when the model of transaction value is developed. Finally, perceptions of value have a positive influence on willingness to buy the bundle.

Model of Bundle's Transaction Value

In the model of bundle's acquisition value (Figure 11) reference was made to the role of transaction value, the perception of savings in a

transaction. However, details of how transaction value is formed in a bundling situation were not developed. In this section, the focus will be on these details.

Conceptual Development

In an attempt to enhance sales of both individual items and bundles, sellers often offer savings on items and additional savings on bundles (i.e., savings over and beyond those on the items). For example, consider the savings offered on the individual items and the bundle in the following offer:⁶

Item	Regular Price	Sale Price
A	\$100	\$90
B	\$ 50	\$40
	-----	-----
	\$150	\$130

Or Buy both A and B for \$120

A fundamental question that needs to be addressed is how buyers' total transaction value (i.e., perceived savings in the bundle offer) is formed in this environment of savings. Four framing possibilities can be enumerated: transaction value 1) is influenced only by the additional savings offered on the bundle ($\$130 - \$120 = \$10$), 2) is influenced only

⁶ In some sale situations, sellers may even indicate a bundle's regular price. In this conceptual development, however, the effect of a bundle's regular price is not modeled.

by savings offered on the items ($\$150 - \$130 = \$20$), 3) is influenced by additional savings offered on the bundle and savings offered on the items ($\$10 + \$20 = \$30$), or 4) is influenced neither by perceived additional savings offered on the bundle nor by savings offered on the items; instead, savings in a bundle offer are framed as a comparison of the bundle price and the sum of the items' reference prices ($\$150 - \$120 = \$30$). For the sake of brevity, these four framing possibilities will be referred to as frames in the discussion presented below.

Which, if any, of these four frames is theoretically more plausible? Two observations made by Thaler (1985) appear to support the third frame described above. First, Thaler (1985) has argued that "people try to frame outcomes in whatever way makes them happiest" (p. 202). Hence frames 3 and 4, by incorporating more savings, lead to a higher transaction value and may therefore be the preferred methods of framing savings in the bundle offer. Second, Thaler has also argued that segregation of multiple gains instead of integration (i.e., perceiving multiple gains separately rather than jointly) leads to higher perceptions of overall gain and may therefore be the preferred method of framing multiple gains. Perceiving savings in a bundle offer as 1) additional savings offered on the bundle and 2) savings offered on the items (frame 3) is analogous to segregation, while frame 4 implies the integration of gains. According to Thaler (1985), frame 3 may therefore be preferred by buyers.

The Model

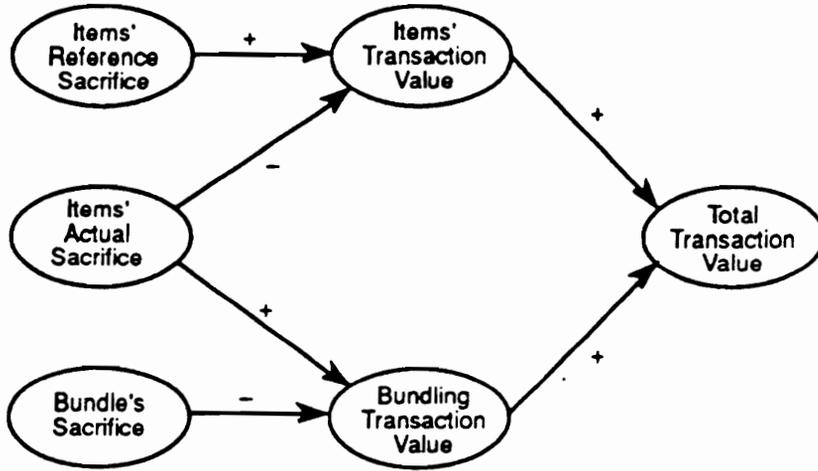
Following these arguments, the model shown in Figure 12 is based on the premise that transaction value in a bundle offer is influenced by 1) perceived savings offered on the items and 2) perceived additional savings offered on the bundle. Before the hypothesized relationships are described, definitions of the six constructs are presented.

1. Items' Reference Sacrifice: The perception of monetary loss associated with the total amount required to purchase all the bundle items separately at their regular prices.
2. Items' Actual Sacrifice: The perception of monetary loss associated with the total amount required to purchase all the bundle items separately at their sale prices.
3. Bundle's Sacrifice: The perception of monetary loss associated with the amount required to purchase the bundle at the offer price.

Three additional constructs are now defined which relate to the perceptions of savings.

4. Items' Transaction Value: The perception of savings associated with the amount required to purchase all the bundle items separately in the offer.
5. Bundling Transaction Value: The perception of savings associated with bundle items as a set versus purchasing the bundle items separately.
6. Total Transaction Value: The perception of savings associated with purchasing the bundle of items as a set.

Given these definitions, the hypothesized relationships can now be described. First, consider the influences on items' transaction value. The model posits that items' actual sacrifice, relative to items' reference sacrifice, determines items' transaction value; items' reference sacrifice serves the role of a reference point and hence positively influences items' transaction value. Similarly, bundle's sacrifice relative



Note: 1. Signs (+ or -) of the hypothesized relationships are as shown.

FIGURE 12. CONCEPTUAL MODEL OF BUNDLE'S TRANSACTION VALUE

to items' actual sacrifice determines bundling transaction value; items' actual sacrifice is the reference point in this situation. Total transaction value, jointly determined by items' transaction value and bundling transaction value, is positively influenced by both. However, to buyers intending to purchase the bundle, additional savings offered on the bundle may be more salient than savings offered on the items. Hence, the influence of bundling transaction value (on total transaction value) may be greater than that of items' transaction value.

Section Summary

Two conceptual models were developed in this section: 1) the model of acquisition value and 2) the model of transaction value. The model of acquisition value focused on the effects of both price and non-price information in the context of bundle evaluation. Specifically, it was proposed that buyers evaluate bundle offers using an anchoring and adjustment process. The model of transaction value is based on the premise that perceptions of overall savings in a bundle offer are influenced by 1) perceived savings on the items and 2) perceived additional savings on the bundle.

EVALUATION OF BUNDLES: THEORETICAL PROPOSITIONS

Theoretical arguments presented above indicate that buyers will evaluate a bundle offer using an anchoring and adjustment strategy. Issues

unique to the role of price information were also discussed. This section now uses arguments and issues presented in earlier sections to articulate a few propositions. The propositions are presented separately for 1) the model of acquisition value and 2) the model of transaction value.

Model of Bundle's Acquisition Value

General Process. An important argument developed in this chapter is that buyers evaluate bundle offers using an anchoring and adjustment process. Four stages of this process were described in the conceptual development: 1) scanning, 2) anchoring, 3) evaluation, and 4) adjustment.

P1: Buyers will evaluate the items of a bundle using an anchoring and adjustment strategy.

P2: The anchoring and adjustment strategy will have four identifiable stages: 1) scanning, 2) anchoring, 3) evaluation, and 4) adjustment.

P3: The anchoring and adjustment strategy will entail 1) making an initial evaluative judgment and 2) subsequently adjusting this assessment as more bundle items are examined and evaluated.

Information Scanning. A distinction was made earlier between two types of bundle information: differentiated and undifferentiated. When bundle items constituting a bundle are perceived to be differentially indicative of how good or bad the bundle is, the items are said to be differentiated. In contrast, undifferentiated bundle items are not perceived to be differentially indicative of how good or bad the bundle is.

It was noted that during the scanning stage of the anchoring and adjustment process, differentiated bundle items may be examined with a

certain degree of selectivity. Usually items perceived to be more important, salient, or diagnostic (of a bundle's worth) will be examined first. Undifferentiated items, on the other hand, may be processed with little or no degree of selectivity. In such situations, the sequence of examination will usually follow the sequence in which information is presented.

P4: The sequence in which the bundle items are attended to during the scanning stage will depend on whether the items are perceived by the buyer as differentiated or undifferentiated.

P5: If the bundle items are perceived to be differentiated, items perceived to be more important, salient, or diagnostic (of bundle worth) will be scanned earlier by buyers.

P6: If the bundle items are perceived to be undifferentiated, items will be scanned in a sequence that follows the sequence in which they are presented to the buyers.

Anchoring/Adjustment. After the scanning stage has sufficiently oriented the buyers to the bundle information, buyers initiate the evaluation process by examining and evaluating the anchor and other bundle items.

P7: Buyers will initiate the evaluation process by first evaluating that bundle item that is perceived to be most important, salient, or diagnostic of bundle worth. Remaining bundle items will be subsequently evaluated in the decreasing order of perceived importance, salience, or diagnosticity.

Lopes (1982) has shown that, in general, anchoring and adjustment processes are characterized by primacy. This implies that evaluations made earlier (e.g., the anchor evaluation) have a greater influence than subsequent evaluations on the overall evaluation. Another way to express this is that adjustments made during anchoring and adjustment will be biased toward the anchor evaluation.

P8: While evaluating a bundle, the anchoring and adjustment heuristic will result in primacy in that items evaluated earlier will have greater influence than subsequent items on the overall bundle evaluation.

P9: While evaluating a bundle, the anchoring and adjustment heuristic will be characterized by insufficient adjustments in that the overall bundle evaluation will be biased towards the anchor evaluation.

Assimilation-Contrast Effects. According to the Gestalt principle of outstandingness, some objects attract more attention than others. In the context of bundle offers, evaluation of the anchor item serves as a reference to evaluate other items in the bundle.

P10: Buyers' evaluation of items in a bundle will be made relative to the anchor evaluation; the consequent assimilation-contrast effects may bias the non-anchor items' evaluations.

Effect on Quality/Benefits Perceptions. As shown in the upper portion of the conceptual model (Figure 11), the anchoring and adjustment process is used by buyers to form perceptions of bundle quality and perceptions of benefits obtainable from the bundle.

P11: Buyers use an anchoring and adjustment process to form perceptions of bundle quality and benefits.

Influence of Price Information

The constructs and the relationships between them are shown in Figure 11. Arguments supporting these relationships have already been presented in earlier sections. The propositions shown below reflect these relationships; *ceteris paribus* is assumed.

P12: There is a positive relationship between buyers' bundle reference price and perceptions of bundle quality.

P13: There is a positive relationship between buyers' perceived bundle quality and perceptions of benefits obtainable from the bundle.

P14: There is a positive relationship between buyers' perceived bundle benefits and acquisition value.

P15: There is a positive relationship between bundle price and buyers' perceptions of sacrifice.

P16: There is a positive relationship between buyers' acquisition value and perceived value of a bundle.

P17: There is a positive relationship between buyers' transaction value and perceived value of a bundle.

P18: There is a positive relationship between buyers' perceived value of a bundle and willingness to buy the bundle.

Model of Bundle's Transaction Value

The following propositions are based on the conceptual model shown in Figure 12; *ceteris paribus* is assumed for each proposition.

P19: Items' reference sacrifice will positively influence items' transaction value.

P20: Items' actual sacrifice will negatively influence items' transaction value.

P21: Items' actual sacrifice will positively influence bundling transaction value.

P22: Bundle's sacrifice will negatively influence bundling transaction value.

P23: Items' transaction value and bundling transaction value will positively influence the bundle's total transaction value; however, the influence of bundling transaction value will be greater than that of items' transaction value.

CHAPTER SUMMARY

Bundling was defined as the practice of selling two or more products together at a single price. In a pure bundling strategy, the individual products are not offered individually by the seller. Although several variations of a bundling strategy (mixed-joint, mixed leader, add-on) can be created, this dissertation's focus is on pure bundling and mixed-joint bundling. Specifically, this dissertation seeks to understand the process used by buyers to evaluate bundles and how that process eventually leads to perceptions of value.

This chapter began by reviewing the economics literature on bundling. Research interest in bundling spans a period of almost three decades and several insights have been provided about the phenomenon. Guided primarily by a desire to analyze seller profitability issues and public policy implications, the economics literature focuses almost exclusively on the aggregate market. Some of the sellers' motivations (for bundling) identified in the literature are: 1) increased profits through implicit price discrimination, 2) increased profits by sorting customers on the basis of their reservation prices, 3) greater efficiency created by limiting buyer search, and 4) reductions in production, transportation, and storage costs.

The literature on bundling has three major shortcomings. First, a majority of the literature is analytical and has little empirical content. In fact, only a few empirical investigations could be identified that focussed specifically on the question of bundle evaluation. Second, the

predominantly analytical literature makes several simplifying assumptions. These assumptions remain empirically unvalidated. However, there is evidence that several analytical results based on the economics literature are sensitive to violations of the underlying assumptions. A third shortcoming of the literature is its inadequate emphasis on individual buyer behavior. Questions related to the evaluation of bundles by individuals, though important from a marketing and consumer research perspective, have received inadequate research attention.

In order to focus specifically on the evaluative processes of buyers in the context of bundle evaluation, this chapter provided a broad overview of the decision research literature. The distinction between normative and descriptive approaches was described. The important idea emerging from this review was that humans make frequent use of simple procedures called heuristics to approach judgment and decision tasks.

Details of one such heuristic, anchoring and adjustment, were then presented. By examining the information structure of bundle offers, it was concluded that buyers are likely to use an anchoring and adjustment strategy to evaluate bundle offers. To provide a theoretical explanation of how price information would be processed during bundle evaluation, relevant developments in pricing research were reviewed. Finally, insights from the decision and pricing research were integrated to develop two conceptual models of bundle evaluation: 1) model of bundle's acquisition value and 2) model of bundle's transaction value. Based on these models, several propositions were articulated.

CHAPTER III

METHODOLOGY AND PRETESTING (EXPERIMENT 1)

OVERVIEW

The purpose of this chapter is to present the methodology used to test the anchoring and adjustment conceptualization developed in Chapter II. Results of the empirical tests will be presented in Chapter IV. Subsequently, Chapters V and VI will present the design and results of experiment 2 which tests the model of transaction value.

This chapter is organized in three major sections. First, a brief overview of the conceptualization developed in Chapter II is presented, summarizing the essential conceptual ideas and the hypothesized relationships to be tested in this research effort. Second, the operational hypotheses tested in this research effort are presented. Finally, methodological details of the experiment and changes made on the basis of pretests are discussed.

ANCHORING AND ADJUSTMENT: A RECAPITULATION

The conceptualization developed in Chapter II was motivated by two primary objectives: 1) provide an explanation of how buyers may examine

and evaluate the price and non-price information presented in a bundle offer, and 2) examine the effect of alternative price formats on the evaluation of bundles. Two conceptual models were developed to address these issues: 1) model of bundle's acquisition value, and 2) model of bundle's transaction value.

The conceptual model of bundle's acquisition value focuses on the influence of both non-price and price information (see Figure 11). The experiment described in this chapter pertains to the influence of non-price information. Specifically, this experiment tests the hypothesis that buyers evaluate a bundle of items using an anchoring and adjustment process. (The model of bundle's transaction value was tested in experiment 2, discussed later in Chapters V and VI.)

Regarding the underlying process used by buyers to examine and evaluate bundle offers, the conceptualization posits a heuristic called anchoring and adjustment that may be used by humans in judgment and evaluation tasks. Essentially, this heuristic implies that a bundle of products will be evaluated sequentially, starting with evaluation of the bundle item that is perceived to be most important. This initial evaluation then serves as an anchor--that is, as a reference--to evaluate the complete bundle. As more bundle items are examined sequentially, the initial anchor evaluation will be revised to accommodate the new information. This revision resembles an averaging process.

HYPOTHESES

As indicated above, the conceptualization proposes that buyers use an anchoring and adjustment and adjustment process to form an overall evaluation of the bundle items. Five hypotheses stemming from this proposition and tested in the first experiment are presented below.

Anchoring and Adjustment. The hypotheses regarding the underlying evaluative process to be tested in this research are:

H1: Buyers will form an overall evaluation of a set of bundle items in a bundle offer by using an anchoring and adjustment process that entails 1) making an initial evaluative assessment and 2) subsequently adjusting this assessment as more bundle items are examined and evaluated.

H2: As buyers examine a bundle offer, bundle items perceived to be more important will be examined prior to those items perceived to be less important.

H3: During the anchoring and adjustment process, the nature of adjustments will resemble averaging; consequently, the overall evaluation of a bundle's items will be a weighted average of the individual items' evaluations.

Influence of Anchor Evaluation on Other Items. Because the anchor bundle item is examined prior to other items in the bundle, evaluation of the anchor serves as a reference against which other items are evaluated. The framing effects discussed in Chapter II suggest that the anchor evaluation may influence the evaluation of other items in the bundle (hypothesis 4 below) The specific nature of the influence will depend on whether an item's evaluation is assimilated or contrasted with the anchor evaluation. This argument suggests two alternative hypotheses (5a and 5b)

H4: Buyers will use the initial anchor evaluation to anchor subsequent evaluations of the bundle's other items.

H5a: If the evaluation of a bundle item is perceived to be similar to the evaluation of the anchor item, then that item's evaluation will be biased towards the anchor item's evaluation, *ceteris paribus*.

H5b: If the evaluation of a bundle item is perceived to be different from the evaluation of the anchor item, then that item's evaluation will be biased away from the anchor item's evaluation, ceteris paribus.

EXPERIMENT 1: METHODOLOGY AND PRETESTING

As indicated earlier, the primary objective of this experiment was to provide an empirical test of the hypothesis regarding the underlying process buyers use to evaluate a bundle of products. Specifically, this hypothesis posits that the underlying evaluative process will exhibit characteristics of the anchoring and adjustment heuristic. This section provides details of the experiment used to test this hypothesis.

Need for a Computer-Assisted Experiment

The hypotheses related to the anchoring and adjustment process suggest an underlying evaluative process that is not directly observable. The strategy adopted in the experiment is consistent with the traditional S-O-R (stimulus-organism-response) model where O refers to the invisible underlying process. In empirical investigations that fall in the general tradition of the S-O-R model, the invisible underlying process is typically inferred from an analysis of changes in R when S is manipulated in some systematic way. A similar strategy was adopted in the experiment described below.

Although the underlying process is not directly visible, the use of computer software can enable an investigator to record at least some as-

pects of the process. These measures are usually referred to as unobtrusive measures because they are obtained without overtly sensitizing subjects. Obtrusive measures, on the other hand, typically make subjects aware of the measurement process. This awareness, in turn, may sometimes even change the underlying process. Obtrusive measures, therefore, may present some errors in providing direct measures of an underlying process.

Given these concerns, it was decided that use of a computer software would be appropriate in the context of this empirical investigation. Specifically, the choice of software was based on the primary criterion that it should provide unobtrusive measures of the order in which bundle items in a pure bundling offer are examined. As will be recalled, this process-related concern is important in the context of the hypotheses presented earlier. A software package called Ci2 (Sawtooth Software Inc. 1987) was selected because it rated satisfactorily on the criterion mentioned above. It may be relevant to present some details of this software before the actual experiment is described.

Ci2 is basically an electronic questionnaire. It resembles a traditional paper-pencil questionnaire in that it enables an investigator to elicit responses from a subject/respondent to a series of questions. The questions are displayed on a computer screen and responses have to be keyed in from a keyboard. Despite this obvious similarity with a paper-pencil questionnaire, Ci2 has several interactive capabilities that are not possible (or cumbersome to implement) in the traditional method. The use of these capabilities will be illustrated below when the actual experiment is described.

Experimental Design

A 3(bundle context) X 2(anchor context) between-subjects design was used to investigate the process used by buyers to evaluate a bundle of products in a pure bundling situation (see Figure 13). In order to understand the nature of the two manipulated factors in this experimental design, consider three hypothetical products A, B, and C. Regarding the specific characteristics of these products, a more elaborate discussion will be presented later in the section "Stimulus Material". For now it should be noted that A, B, and C were selected such that, on average, the a priori perceived importance of the three products in evaluating the whole bundle would be: $A > B > C$. Based on pretests, the following bundles were used in this experiment: 1) Computer System consisting of a personal computer (A), dot matrix printer (B), and a 3-shelf printer stand (C); and 2) Bedroom Package consisting of a queen-size bed (A), a 5-drawer chest (B), and a 2-drawer night stand (C).

With the general nature of A, B, and C thus explained, the two experimental factors can be now described. The factor bundle context refers to different types of evaluation scenarios created by offering 1) A, B, C separately, 2) A and B as a bundle and C individually and 3) A, B, and C as a bundle. Consequently, subjects in different treatment cells of the experimental design (see Figure 13) made the following evaluative judgments:

Bundle Context

Evaluations Made

		BUNDLE CONTEXT		
		A,B,C	(A+B),C	(A+B+C)
ANCHOR CONTEXT	Excellent	1	2	3
	Poor	4	5	6

FIGURE 13. EXPERIMENTAL DESIGN 1: TESTING THE ANCHORING AND ADJUSTMENT HYPOTHESIS

- A, B, and C (cells 1,4) Items A, B, and C were presented as individual products and evaluated as such
- (A+B), C (cells 2, 5) Items A and B were presented and evaluated as bundle. Evaluations of the individual items A and B were also made after the bundle evaluation. Subsequently, item C was presented and evaluated as an accessory that is sold along with the bundle (A+B).
- (A + B + C) (cells 3, 6) Items A, B, and C were presented and evaluated as a bundle. Evaluations of the individual items were also made.

These three scenarios provided the three levels of the bundle context factor and permit an empirical testing of the anchoring and adjustment hypotheses.

The second experimental factor, anchor context, had two levels: excellent and poor. This factor refers to how good or bad the anchor's description was manipulated to be. Anchor context was manipulated by making descriptions (and hence perceptions) of the anchor either excellent or poor. Descriptions of other bundle items were manipulated to suggest a moderate-quality level (i.e., between excellent and poor) in all experimental conditions so that the anchoring and adjustment's averaging influence could be empirically tested.

Dependent Measures: Definitions

Four dependent measures were obtained from each subject after the evaluation process had been completed (details of the experimental tasks are described in a later section). These measures are now defined.

1. Perceived Bundle Quality: A buyer's overall assessment of excellence of all bundle items considered together as a set.
2. Perceived Item Quality: A buyer's assessment of excellence of each item in the bundle.
3. Relative Saliency of Bundle Components: A buyer's perception of how important a bundle item is in relation to other bundle items while evaluating the overall bundle.
4. Scanning Order: The order in which a bundle items were examined as subjects proceeded with the evaluation process.

The last measure was recorded by the software as a subject selected and examined bundle items one at a time.

Four pretests were conducted to make decisions about the operational details of this experiment. Pretest 1 selected appropriate products to be used as stimuli. Pretests 2 and 3 developed descriptions of the selected products and scales for measures of perceived quality. Finally, pretest 4 developed and tested the electronic questionnaire that was used in this experiment. Results of these pretests are now discussed.

Results of the Pretests

Four pretests were conducted to operationalize the methodology used in this empirical investigation. In describing the pretests, emphasis will be placed on demonstrating the primary insights that were obtained in each pretest, and how these insights were incorporated in the actual conduct of the first experiment.

Pretest 1

Objective. The purpose of this pretest was to select product bundles that could be used as stimuli in the experiment. Based on informal conversations with students, six different bundle offers were selected for formal testing in this pretest. The three criteria that guided the selection of these bundles were: 1) subjects should have sufficient familiarity with and knowledge of the products contained in the bundles, 2) items in a bundle should be perceived as differentially important for forming an overall evaluation of the bundle, and 3) one item in each bundle clearly should be considered more important than the other items in that bundle.

The following bundles were selected for this pretest:

Bundle Offer	Items in the Bundle
1. Photography Kit	35mm Camera, Zoom Lens, Tripod Stand
2. Computer System	Computer, Dot Matrix Printer, Software
3. Luggage Set	Pullman, Carryon, Tote
4. Livingroom Set	Sofa, Loveseat, Coffee Table
5. Fall/Winter Ensemble	Leather Jacket, Sweater, Shirt
6. Bedroom Set	Bed, Chest, Nightstand

Instrument. The instrument developed for this pretest is shown in Appendix A. The cover page explained that as part of an on-going market research project, the researchers were "interested in the opinions of students such as yourself." The instrument was divided into seven major sections. Each of the first six sections dealt with one of the six bundle offers described above. The bundle offer and its items were clearly identified at the beginning of each section and were followed by scales pertaining to the two variables of interest: 1) relevance of the shown products (items

1-5) and 2) perceived knowledge about the products (items 6-9). These measures were based on the scale development work reported by Grewal (1989) and Zaichkowsky (1985). In the task immediately following the the measures of relevance and perceived knowledge, respondents were asked to distribute 100 points between the the items of each bundle to indicate the relative importance to them of each item in the bundle. Finally, estimates of the average retail prices of the items were obtained.

Seventy students enrolled in undergraduate business courses participated in this pretest.

Relevance and Knowledge. Reliability and mean scores of the summed relevance and perceived knowledge scales are shown in Table 1. Reliability was satisfactory for all bundles ($\alpha > 0.8$). For the knowledge scale with four 7-point items (range 4-28), mid-point 16 was considered appropriate for identifying low and high scores. The midpoint of the relevance scale (five 7-point items; range 5-35) was 20. As shown in the table, the photography kit and the luggage set were low on the knowledge scale. The relevance measure for the photography kit was also low.

Relative Saliency of the Bundle Items. The importance points for each item provided one measure of relative saliency. A second measure, relative expensiveness, was developed by expressing (for each subject) the price of each item as a percentage of the summed prices of all the items in the bundle. In Table 2, the measure of relative saliency based on points is shown as relative importance. The second measure based on prices is labeled as relative expensiveness. The mean values shown in the table are based on the average of these values across respondents.

TABLE 1
PRETEST 1: MEASURES OF RELEVANCE AND KNOWLEDGE

Bundle	Relevance ¹			Knowledge ²		
	Mean	SD	α	Mean	SD	α
1. Photography Kit	18.0	7.2	0.95	14.9	5.2	0.90
2. Computer System	28.2	5.7	0.96	19.9	4.7	0.90
3. Luggage Set	20.7	6.8	0.96	16.9	5.4	0.93
4. Livingroom Furniture	25.2	7.0	0.97	20.7	4.6	0.84
5. Clothes Ensemble	29.2	5.3	0.98	23.8	3.5	0.88
6. Bedroom Furniture	27.8	6.4	0.98	21.9	3.9	0.82

¹Means and standard deviations (SD) are based on the sum of a 5-item/7-point rating scale; N = 70.

²Means and standard deviations (SD) are based on the sum of a 4-item/7-point rating scale; N = 70.

TABLE 2
PRETEST 1: MEASURES OF RELATIVE SALIENCE

Means and Standard Deviations² of:

<u>Bundle and its items</u>	<u>Relative Importance</u>	<u>Relative Expensiveness²</u>	<u>Retail Price (\$)</u>
A. Photography Kit:			
35mm Camera	62.3 (15.4)	55.0 (10.0)	226 (101)
Zoom Lens	27.1 (13.2)	28.1 (8.7)	121 (79)
Tripod	10.5 (6.6)	16.8 (6.8)	67 (42)
B. Computer System:			
Computer	54.2 (13.6)	70.3 (10.7)	1443 (769)
Printer	20.6 (9.1)	20.2 (7.2)	378 (210)
Software	25.8 (11.4)	9.5 (6.9)	160 (113)
C. Luggage Set:			
Pullman	35.1 (17.3)	43.9 (11.2)	97 (51)
Carryon	37.2 (14.4)	30.7 (9.4)	65 (31)
Tote	28.1 (14.0)	25.3 (7.6)	55 (30)
D. Living Room Furniture:			
Sofa	53.3 (13.4)	50.8 (7.2)	637 (362)
Love Seat	23.4 (11.2)	32.5 (6.2)	388 (165)
Coffee Table	23.6 (9.3)	16.7 (6.6)	202 (130)
E. Clothes Ensemble:			
Leather Jacket	34.7 (22.0)	75.0 (5.9)	266 (11)
Sweater	33.2 (13.9)	15.7 (4.2)	54 (23)
Shirt	32.3 (17.6)	9.3 (2.5)	31 (12)
F. Bedroom Furniture:			
Bed	63.2 (13.7)	48.6 (10.8)	402 (312)
Chest	23.4 (8.9)	35.0 (9.1)	280 (213)
Night-Stand	13.3 (7.8)	16.4 (5.9)	134 (136)

¹Means and standard deviations are based on N = 70. Standard deviations are shown in parentheses.

²Subject-stated retail price expressed as a % of the total bundle retail price.

Recall that one objective of this pretest was to identify those bundles that had one dominant item in terms of perceived importance. Based on this criterion, three bundles (the luggage set, the living room furniture, and the clothes ensemble) were clearly not appropriate because the importance points were divided almost equally across the three items in each bundle (see Table 2).

Another way of identifying inappropriate bundles is to rank order the salience measures for each subject and then determine a statistic that measures the consistency of this rank ordering across subjects. Clearly, a low degree of consistency would indicate that the rank ordering across subjects was not the same. One statistic that measures such a degree of consistency is Kendall's W. The statistic W is bound between 0 and 1; lower values close to 0 indicate a lack of consistency in the rank ordering across subjects.

In Table 3, the statistic W is reported for the six bundles. Looking under the column for relative importance, the low values for the luggage set, livingroom furniture, and clothes ensemble suggested that these bundles may not be appropriate. Note that this decision is in agreement with the one made above based on the mean values of the salience measure.

Decisions Based on Pretest 1. Examining the relevance and knowledge measures suggested that the photography kit and the luggage set should not be pursued further. Additionally, the luggage set, livingroom furniture, and clothes ensemble did not fare well on the relative salience measure. These eliminations left the computer system and the bedroom furniture as suitable bundles for further consideration. However, the

TABLE 3
PRETEST 1: CONSISTENCY OF RELATIVE SALIENCE ACROSS SUBJECTS

Bundle	Measure of Relative Salience:					
	<u>Relative Importance</u>			<u>Relative Expensiveness</u>		
	<u>W</u> ¹	<u>$\chi^2(2)$</u>	<u>p</u>	<u>W</u>	<u>$\chi^2(2)$</u>	<u>p</u>
1. Photography Kit	.90	126.6	.00	.78	109.3	.00
2. Computer System	.67	94.2	.00	.91	126.6	.00
3. Luggage Set	.09	12.9	.01	.42	56.6	.01
4. Livingroom Furniture	.58	81.4	.00	.93	131.3	.00
5. Clothes Ensemble	.01	2.0	.36	.97	136.6	.00
6. Bedroom Furniture	.85	120.3	.00	.77	109.1	.00

¹Kendall's W; larger values close to 1.0 indicate greater degree of consistency; based on N = 70.

salience values for the items in the computer system (see Table 2) showed that the software and the printer received almost equal importance points. Because bundles with differentially salient items were desirable for this investigation, the software item was replaced by a printer stand in the next pretest.

Pretest 2

Objective. Having selected the product bundles to use in the experiment, the next step was to develop suitable descriptions for items in these bundles. Recall that the experimental design (see Figure 13) calls for manipulating the anchor item's description over two levels: excellent and poor. For all other non-anchor items, moderate evaluations were needed. The purpose of this pretest was to test the appropriateness of the descriptions developed for these items to match the desired manipulations.

Instrument. The instrument employed in this pretest is shown in Appendix B. The cover page informed the respondents that they would be shown descriptions of some products and then asked questions about the products. Additionally, it was indicated that the descriptions had been taken from Consumer Reports.

The first two sections of the instrument were designed to obtain measures of relative salience for the two bundles selected on the basis of pretest 1: the computer system and the bedroom furniture bundle. Sections 3 through 10 then presented descriptions of the items and asked subjects to respond to a set of measurement scales. The four scale items

following the description were designed to measure the perceived quality of the item shown in that section (see Appendix B for details of the four items). Each section of the questionnaire pertained to one product.

Twenty seven students from pretest¹ participated in this pretest.

Effectiveness of the Product Descriptions. Prior to examining the effectiveness of the descriptions, reliability of the 4-item measure of perceived quality was found to be satisfactory ($\alpha > 0.8$; see Table 4).

Table 5 shows the summed score of the 4-item perceived quality measure averaged across subjects. Each item being a 7-point rating scale, a rating of 4 (the mid point) on all items would give a summed score of 16. Consistent scoring on the extremes of this scale would give summed scores of 8 and 28. Hence, ideally, the moderate-quality description should have been in the vicinity of 16. Descriptions of poor and excellent quality should have yielded values close to 4 and 28 respectively. Looking at the numbers in Table 5, it appears that the extreme manipulations (i.e., poor and excellent) worked well. However, the scores for the non-anchor items all tended to be lower than 16. More importantly, the relatively large standard deviations suggested that the descriptions of these products were perceived with a substantial degree of ambiguity.

Relative Salience of Bundle Items. As a replication of the relative salience measures obtained in pretest 1, these measures were analyzed again with the data collected in this pretest. Table 6 shows that the general pattern of salience values for the various items in the two bundles was the same as that found in pretest 1. Specifically, the anchor items (bed and the computer) were clearly perceived to be dominant as

TABLE 4
PRETEST 2: RELIABILITY OF THE PERCEIVED QUALITY MEASURE

<u>Items</u>	<u>Cronbach's Alpha¹</u>
A. 1. Computer (excellent)	0.85
2. Computer (poor)	0.84
3. Dot Matrix Printer	0.95
4. Printer Stand	0.88
<hr/>	
B. 5. Bed (excellent)	0.81
6. Bed (poor)	0.93
7. Chest	0.95
8. Night Stand	0.94
<hr/>	

¹Based on a 4-item/7-point rating scale, N = 27.

TABLE 5
PRETEST 2: MANIPULATION CHECKS OF PERCEIVED QUALITY

<u>Item</u>	<u>Perceived Quality</u> ¹			
	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>SD</u>
A. Computer (poor)	4.0	16.0	9.3	3.2
Computer (excellent)	22.0	28.0	25.7	2.0
Printer	4.0	24.0	13.4	5.3
Printer Stand	4.0	22.0	11.6	4.0
<hr/>				
B. Bed (poor)	4.0	21.0	6.7	3.8
Bed (excellent)	21.0	28.0	26.4	1.8
Chest	4.0	24.0	13.8	5.9
Night Stand	4.0	23.0	12.1	5.2

¹Based on a 4-item/7-point rating scale; N = 27

TABLE 6
PRETEST 2: MEASURES OF RELATIVE SALIENCE

<u>Bundle and its items</u>	<u>Relative Importance</u>		<u>Relative Expensiveness¹</u>	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
A. Computer Bundle				
Computer	63.6	15.9	77.4	7.3
Printer	28.4	13.0	18.9	6.4
Printer Stand	7.0	4.9	3.6	2.2
<hr/>				
B. Bedroom Bundle				
Bed	63.0	16.8	51.0	11.0
Chest	22.7	10.2	33.6	9.0
Night Stand	14.3	10.0	15.3	4.7

NOTE: Means and standard deviations based on N = 27

¹Subject-stated retail price expressed as a % of the total bundle retail price.

suggested by their relatively large salience measures. The items second and third in perceived importance also seemed to be clearly defined.

Another way of looking at the relative salience information is to do some analysis at the individual level. To explore the degree of consistency, it may be instructive to see how the rank ordering of the salience measure varied across respondents. Table 7 shows the variation in this rank ordering. In panel A of the table, it is clear that for a large percentage (96.4) of the respondents the computer was ranked first using relative importance as the salience measure; only for a mere 3.6% respondents was the computer ranked second. Similarly, the printer was ranked second for a large percentage of the respondents, and the printer stand ranked third for most respondents. The same pattern of salience measures was observed in for the items in the bedroom bundle. Finally, it may also be noted that Kendall's W values for the three items in each bundle were also high (as in pretest 1). Based on these analyses, it was concluded that relative salience of the items in each bundle was as intended.

Decisions Based on Pretest 2. It was decided that descriptions of the non-anchor items (i.e., printer, printer stand, chest, and nightstand) had to be made less negative and less ambiguous. Appropriate changes were made in the descriptions of these items and tested in pretest 3.

TABLE 7
PRETEST 2: RANKING OF RELATIVE
IMPORTANCE AND RELATIVE EXPENSIVENESS

<u>Bundle and its items</u>	Ranking ¹					
	Relative Importance			Relative Expensiveness		
	<u>1</u>	<u>2</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>3</u>
A. Computer Bundle						
Computer	96.4	3.6	0.0	100	0.0	0.0
Printer	7.1	92.9	0.0	0.0	100	0.0
Printer Stand	0.0	14.3	85.7	0.0	3.6	96.4
<hr/>						
B. Bedroom Bundle						
Bed	96.4	0.0	3.6	85.7	14.3	0.0
Chest	3.6	85.7	10.7	21.4	78.6	0.0
Night Stand	3.6	25.0	71.4	3.6	7.1	89.3

¹% times Relative Importance and Relative Expensiveness were ranked 1, 2, or 3 (1 = most important/expensive, 3 = least important/expensive).

Pretest 3

The changed descriptions used in this pretest are shown in Appendices C and D; the instrument remained unchanged from the previous pretest. Analyses to assess relative salience were conducted again. However, because the general pattern of salience measures remained largely unchanged from the previous two pretests, these analyses will not be reported here. The primary objective of this pretest was to see if the changes made in the description of the non-anchor items did make a difference.

The summed evaluation scores for the items are shown in Table 8. The results were mixed. First of all, the problem of description ambiguity found in pretest 2 was successfully reduced in this pretest; the standard deviations declined from about 5 to about 2.5 for all the non-anchor items. However, attempts to make descriptions of the non-anchor items less negative were unsuccessful.

In debriefing sessions, several respondents complained that responding to four seemingly equivalent statements for each bundle was very frustrating. To reduce the possibility of respondent fatigue in the actual experiment, item 3 was dropped from the measure of perceived quality because the impact on Cronbach alphas was lowest for this item. Reliability of the resultant 3-item measure was found to be satisfactory for all the bundles ($\alpha > 0.8$).

TABLE 8
PRETEST 3: MANIPULATION
CHECKS OF PERCEIVED QUALITY

Bundle and <u>its items</u>	Perceived Quality ¹			
	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>SD</u>
A. Computer Bundle				
Computer (poor)	3.0	13.0	7.4	3.1
Computer (excellent)	14.0	21.0	19.0	2.1
Printer	8.0	18.8	12.3	2.3
Printer Stand	6.0	15.0	11.5	2.7
<hr/>				
B. Bedroom Bundle				
Bed (poor)	3.0	14.0	5.3	2.3
Bed (excellent)	13.0	21.0	19.0	2.0
Chest	8.0	17.0	10.8	1.9
Night Stand	3.0	15.0	11.3	3.0

¹Based on a 3-item/7-point rating scale; N = 26.

Pretest 4

With the appropriate bundles selected and descriptions of their items developed, the electronic questionnaire software (Ci2) was used to create electronic questionnaires for each of the six treatment cells of the experimental design. The purpose of this final pretest was to make sure that the instructions seen by respondents on the computer screen were clear and easily understood. No aggregate analyses were conducted, but the nine respondents who participated in this pretest were thoroughly debriefed.

Based on these debriefing sessions, some minor changes in instructions were made in the electronic questionnaires. Specifically, it was found that the experimental task (evaluating a bundle of items) was misunderstood by some subjects. These subjects believed they had to evaluate only the individual items and not the bundle as a whole. Instructions were added to communicate the experimental task more clearly to the subjects.

Summary of Pretests

There were two primary objectives of the pretesting reported in this section: 1) identify suitable bundles that subjects were familiar with and knowledgeable about, and 2) determine if the relative salience of the items in the bundles was sufficiently different from each other (with one clear anchor item), and 3) develop descriptions of each item such that extreme manipulations (poor and excellent) could be obtained for the an-

chor items and moderate manipulations for the non-anchor items. Pretest 1 identified a computer system and bedroom bundle as suitable stimuli. The second pretest tested the descriptions of the items. Pretest 3 made changes in descriptions of the non-anchor items to make them less ambiguous. Finally, pretest 4 tested the electronic questionnaires in different treatment cells of the experimental design, leading to minor adjustments in the instrument used.

Operationalization of Variables

In pretests 2 and 3, multiple items were developed to measure perceived quality of the products. The specific nature of the scale items was, of course, influenced by the types of products included in the bundle offers. More details about how perceived quality and other variables were operationalized in the actual experiment are now presented.

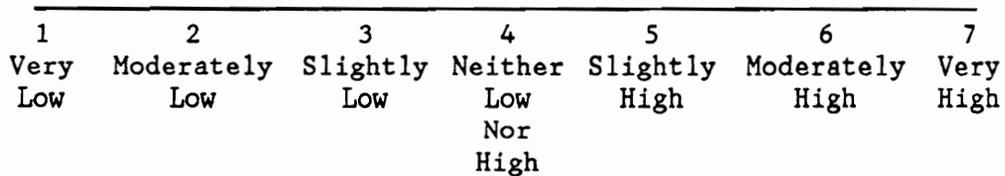
Perceived Quality. Perceived Quality was measured using the following three items (with _____ substituted by either the item or the bundle name):

- 1. The durability of _____ is:
- 2. The dependability of _____ is:
- 3. The quality of _____ is:

For each item, a 7-point rating scale was used with appropriate semantic anchors: 1 = very low, 7 = very high. All scale points had a semantic anchor. The items shown above were used for the computer bundle: personal computer, printer, and printer stand. For the bedroom bundle (bed, chest, and night stand) the items were identical except that in item 2 the word

Using the arrow keys, move the box along the scale to indicate your opinion about:

The DURABILITY of the 2-DRAWER NIGHT STAND



Press ENTER when finished

FIGURE 14. INSTRUCTIONS FOR MEASURES OF PERCEIVED QUALITY

"dependability" was replaced by "workmanship." An example of the durability item is shown in panel A of Figure 14.

Relative Saliency of Bundle Components. This measure was operationalized in three different ways.

1. Rank Ordering: Subjects rank ordered the bundle items in terms of perceived importance. Instructions used to identify the most important item in the bedroom bundle (in cells 3 and 6 of the design) are shown in Figure 15. Instructions for cells 2 and 5 of the design were identical except that only two items were presented and rank ordered.

2. Point Distribution: Subjects distributed 100 points between the items of the bundle they were evaluating. Instructions seen by subjects in cells 3 and 6 of the design are shown in panel B of Figure 15. Similar instructions were employed for the bedroom bundle. Instructions for cells 2 and 5 (where bundles with 2 items were evaluated) were identical except that points were divided between two bundle items instead of three.

3. Relative Expensiveness: Subjects were asked to estimate the average retail price of each item in the bundle they evaluated. Specific instructions seen by subjects for the computer bundle (in cells 3 and 6) are shown in panel C of Figure 15. Instructions in cells 2 and 5 (where bundles with 2 items were evaluated) were identical except that only two items were displayed instead of three. The measure, relative expensiveness, was developed for each subject by expressing the price of each item as a percentage of the total bundle price.

CHAPTER SUMMARY

This chapter developed the methodology used in this research to test empirically the hypotheses presented in Chapter II. The present chapter began with a brief review of the anchoring and adjustment conceptualization articulated in Chapter II. It was pointed out that investigations conducted in this dissertation had two primary objectives: 1) provide a strong empirical test of the anchoring and adjustment hypothesis and 2)

A. Rank Ordering

In this questionnaire, you were asked to form your OVERALL IMPRESSION about a COMPUTER PACKAGE consisting of the following three items:

- 1 PERSONAL COMPUTER
- 2 DOT MATRIX PRINTER
- 3 3-SHELF PRINTER STAND

Which one of these three items was most important to you for forming your OVERALL IMPRESSION about this COMPUTER PACKAGE?

(Press 1, 2, or 3 to indicate the item)

B. Distribution of Points

Now distribute 100 points between the items given below to indicate the RELATIVE IMPORTANCE to you of each item in forming your OVERALL IMPRESSION about the COMPUTER PACKAGE. The greater the relative importance of an item, the more points it should receive.

Type the points for each item and press ENTER. The ENTER key will take you through the list of items until your points total 100.

Package Items

Type Points Here & Press ENTER
After Each Item

3-SHELF PRINTER STAND

PERSONAL COMPUTER

DOT MATRIX PRINTER

....continued

FIGURE 15. INSTRUCTIONS FOR MEASURES OF RELATIVE SALIENCE

C. Average Retail Prices

In the space below, write your estimate of the AVERAGE RETAIL PRICE (in Dollars) of the following items:

Type the price for each item and press ENTER. The ENTER key will take you through the list of items until you are finished.

Items	Type Price Here & Press ENTER After Each Item (Dollars only; No Cents)
3-SHELF PRINTER STAND	
PERSONAL COMPUTER	
DOT MATRIX PRINTER	

FIGURE 15 (continued). INSTRUCTIONS FOR MEASURES OF RELATIVE SALIENCE

investigate the effect of alternative price formats on perceptions of savings in a bundle offer.

Against the backdrop of these objectives, anchoring and adjustment hypotheses to be tested in this research were enumerated. After presenting the methodological details of experiment 2, results of four pretests and their impact on the operational details of the actual experiment, were discussed. It was argued that the hypotheses pertaining to the role of both price and non-price information were too numerous and complex to be adequately tested in one experiment. For this reason, two separate experiments were conducted. Experiment 1, discussed in this chapter, focuses primarily on the (anchoring and adjustment) process used by buyers to evaluate a bundle of items. Experiment 2, the subject of Chapters V and VI, explores the effect of alternative price formats on perceptions of savings in a bundle offer.

CHAPTER IV

DATA ANALYSIS AND RESULTS OF EXPERIMENT 1

OVERVIEW

This chapter presents the results of Experiment 1 that tested the proposition that buyers use an anchoring and adjustment process when evaluating a bundle of items. The discussion presented in the following pages is organized as follows. First, procedural details of the experiment focusing on the 1) cover story, 2) stimulus material, 3) sequence of tasks in the experiment, and 4) subjects are presented. Discussion of these issues is followed by the results of preliminary analyses pertaining to the reliability of measures and the effectiveness of manipulations. Finally, results of analyses conducted to test the hypotheses are presented.

PROCEDURAL DETAILS

This section discusses the procedures followed to conduct the experiment. Specifically, this section presents information on: 1) the cover story, 2) stimulus materials used in the experiment, and 3) sequence of tasks, and 4) subjects who participated in the experiment.

Cover Story

The purpose of the cover story was to provide a plausible context in which subjects could examine and evaluate a bundle of products. Specifically, a "good" story should permit strong manipulations of the relevant factors in the experimental design without making the scenarios appear unlikely or unrealistic. Recall that the experimental design discussed earlier (see Figure 13) entails the manipulation of two factors: bundle context and anchor context. Anchor context is manipulated over two levels (excellent and poor). Hence subjects in cells 1, 2, and 3 would have, on average, an excellent anchor evaluation and a moderate evaluation of the remaining bundle items. Subjects in the cells where the anchor context was poor (cells 4, 5, and 6) would form a poor anchor evaluation.

To obtain strong manipulations, it was necessary to make the anchor evaluation either excellent or poor. A convenient way to present information about bundles could be in the form of a hypothetical advertisement, but it could have created problems because advertisements rarely present information that is severely critical.

To make the anchor evaluation poor in a believable manner, subjects were told that the provided information had been obtained from an impartial publication such as Consumer Reports. Because this experiment was conducted using computers, the cover story presented the experimental task as a computerized version of Consumer Reports. This cover story had the following advantages: 1) it made it possible to present very negative information about a bundle item without making the scenario appear unre-

alistic, and 2) it provided a justification (to the subjects) for the use of computers. Hence, subjects were informed that they were participating in a market research study whose purpose was to "determine if computers can be used to provide information from Consumer Reports to consumers such as yourself." During the debriefing sessions, subjects were informed about the true purpose of the research.

Stimulus Material

In the experimental design, three products A, B, and C were presented (for evaluation) to the subjects either individually or as a bundle offer in a pure bundling situation. The factor bundle context had three levels and presented information in three alternative ways: 1) A, B, and C presented as individual items, 2) A and B presented as a bundle and C individually, and 3) A, B, and C presented together as a bundle. These specific alternative scenarios were selected because they permit an empirical test of whether the overall evaluation of a bundle results from an averaging process. The second factor of the experimental design, anchor context, had to be manipulated over two levels of anchor evaluation: excellent and poor. To avoid possible confounds, no price information was provided.⁷ Descriptions of the items employed in different cells of the experimental design are shown in Appendices C and D.

⁷ As shown in the lower section of the model of bundle's acquisition value (Figure 11), perceptions of bundle quality and benefits are influenced both by the anchoring and adjustment process and by the bundle reference price. To isolate the effect of the anchoring and

Sequence of Tasks

Introduction and Warm-up. The computer-administered questionnaire began with a brief statement about the purpose of the study. This was followed by two warm-up tasks designed to familiarize the subjects with the operation of the computer keyboard. The first warm-up task was designed to instruct subjects about the use of the rating scale (see Figure 16). In the second warm-up task (Figure 17; panel A1 followed by A2 and then A3), subjects practised selecting and examining information about the university campus.⁸

Information Presentation and Evaluation. After the introduction and warm-up, the nature of the computer-assisted questionnaire depended on which experimental cell a subject was assigned to. Figure 18 shows the sequence in which different tasks were completed by subjects in cells 1 and 4 of the design. The sequence of tasks for subjects in the other four cells is shown in Figure 19.

In cells 2, 3, 5, and 6 subjects selected and examined items in a bundle one at a time. Figure 20 shows how the software made it possible

adjustment process from the price effects, it was considered appropriate not to provide any price information as part of the stimulus. Subjects, therefore, made evaluations only on the basis of the manipulated product descriptions. Investigating the influence of price information was the objective of experiment 2 discussed later in Chapters V and VI.

⁸ This task was completed only in cells 2, 3, 5, and 6 of the design where subjects evaluated bundles. Subjects in cells 1 and 4 evaluated only individual items. Therefore, a practice task (for selecting items from a bundle) was considered unnecessary.

PRACTICE EXERCISE (1)

Using the arrow keys, move the box along the scale to indicate your opinion about:

The SUMMERS in Blacksburg

1	2	3	4	5	6	7
Very Cool	Moderately Cool	Slightly Cool	Neither Cool Nor Hot	Slightly Hot	Moderately Hot	Very Hot

NOTE: You can move box to a number or to somewhere in-between two numbers on the scale

Press ENTER when finished

FIGURE 16. WARM-UP EXERCISE #1

A1.

PRACTICE EXERCISE (2)

Assume you were new to Virginia Tech and wanted to know more about the University Campus. Suppose, now, that this computer has information on the following topics:

LIBRARY FACILITIES

TOWN OF BLACKSBURG

STUDENT LIFE

(Press any key to continue)

A2.

We will now demonstrate how you can use the keyboard to see the information on all these topics--one topic at a time.

Lets say you first wanted more information on STUDENT LIFE.

(Press any key to continue)

A3.

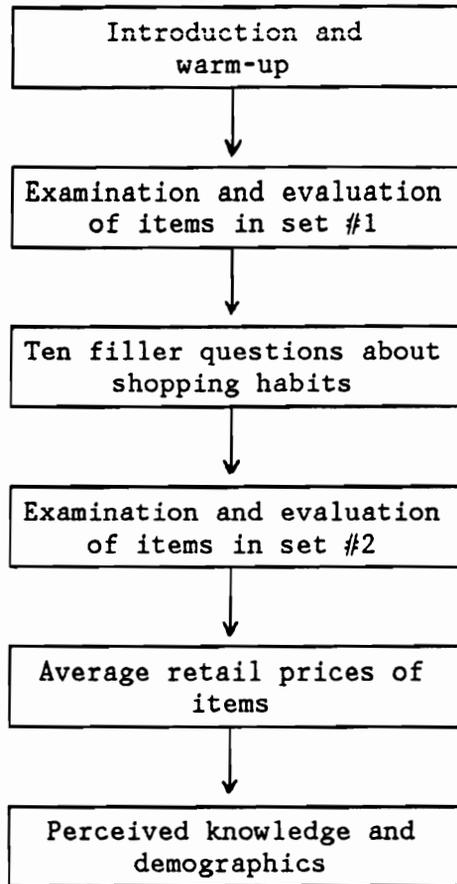
To help you select the topic of your choice, you will see instructions such as:

Press the key of your choice:

- 1 for information on the LIBRARY FACILITIES
- 2 for information on the TOWN OF BLACKSBURG
- 3 for information on STUDENT LIFE

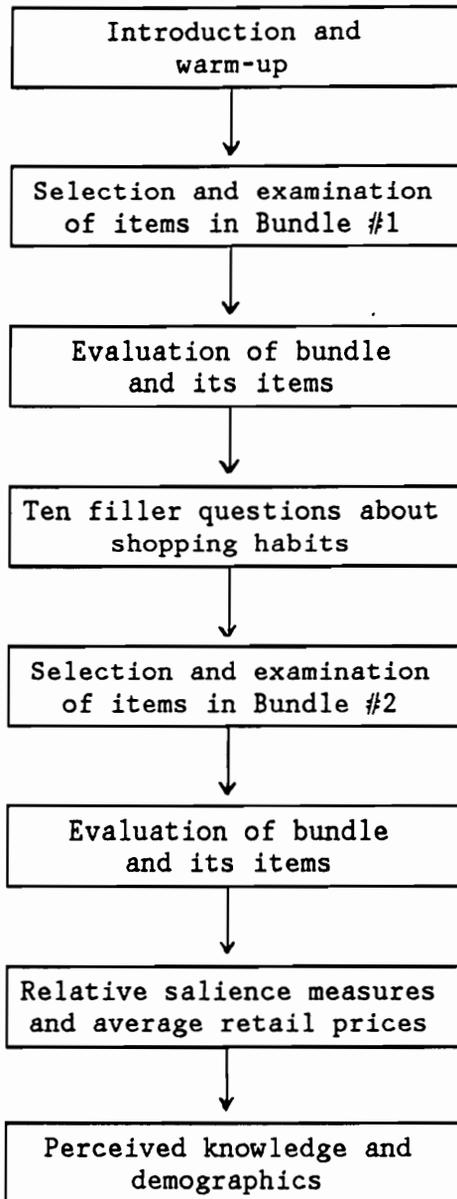
(Now, for practice, press 3 to select STUDENT LIFE)

FIGURE 17. WARM-UP EXERCISE #2



NOTE: 1. The two sets of items were: 1) Printer, Bed, Printer Stand, and 2) Chest, Personal Computer, and Night Stand. The presentation order of set #1 and set #2 was counterbalanced across subjects.

FIGURE 18. SEQUENCE OF TASKS IN CELLS 1 AND 4 OF THE EXPERIMENTAL DESIGN



NOTE: 1. The computer system and bedroom package were the two bundles employed as stimuli. Their order of presentation was counterbalanced across subjects.

FIGURE 19. SEQUENCE OF TASKS IN CELLS 2, 3, 5, AND 6 OF THE EXPERIMENTAL DESIGN

for subjects to select and examine items in any order of their choice, with the order of item presentation randomized by the software. When an item was selected by a subject for examination, the software would present a description of that item. After examining information on that item, subjects would return to the item-selection screen shown in Figure 20. This procedure would continue until the subjects indicated (by pressing X) that they that they were finished. After the subjects pressed X, they were asked to evaluate the overall bundle, followed by evaluations of the individual items.

Subjects

Students as Subjects. Ever since Ferber (1977) admonished the widespread use of students as subjects in consumer and marketing research experiments, various aspects of this controversial issue have been debated quite vigorously by several researchers (Calder, Phillips, and Tybout 1981, 1982, 1983; Lynch 1982, 1983; McGrath and Brinberg 1983). Some of the conclusions emerging from this debate can be summarized as follows.

First, the notion of generalizing results of an experiment should imply the extension of theoretical conclusions not only over populations but also over different settings and methods. In addition, generalizability of results usually cannot be established in the context of one empirical investigation; it usually results by putting together the results of several studies.

You have to form your OVERALL IMPRESSION about the COMPUTER PACKAGE shown below by looking up information on its 3 items--one item at a time.

***** IMPORTANT *****

You should look up information on these 3 items in the order you would actually do so in a Computer Store to form your OVERALL IMPRESSION about this COMPUTER PACKAGE

- 1 PERSONAL COMPUTER
- 2 DOT MATRIX PRINTER
- 3 3-SHELF PRINTER STAND

To look up information on an item, simply press its number.

You can look up information on an item as many times as you wish to (Press X when you have examined all items and formed your OVERALL IMPRESSION)

-
- NOTE: 1. The order of presentation of the three items was randomized across subjects by the software.
2. In cells 2 and 5, only two items were presented instead of the three shown here.

FIGURE 20. INSTRUCTIONS FOR THE EXAMINATION OF ITEMS IN CELLS 2, 3, 5, AND 6 OF THE EXPERIMENTAL DESIGN

The second important conclusion implies that the use of students as subjects is not poor research practice per se. In fact, Calder et al. present arguments that the use of student subjects is justified when the primary concern of an investigator is theory testing. In this context, the homogeneity of students on several behavioral dimensions usually facilitates theory testing by reducing "noise" in the data and thus increasing the power of statistical tests.

And, finally, the third conclusion is that it is necessary to incorporate what Lynch (1982, 1983) refers to as the background variables. His essential argument is that if these background variables are not included in a design and they happen to interact with the factors being manipulated in the experiment, incomplete or false interpretations of the experimental results can be made. Regarding the selection of subjects, this implies that the experimental stimuli and tasks should be relevant to the subject population.

The primary concern of this experiment was to test empirically the theoretical assertion that a bundle of products in a pure bundling situation will be evaluated using an anchoring and adjustment heuristic. With this emphasis on internal validity, a student sample appeared to be appropriate for the purposes of this investigation. However, it is acknowledged that the exclusion of relevant background variables (e.g., knowledge) may limit the generalizability of empirical findings.

Sample Characteristics and Case Deletion. One hundred and eighty undergraduate students enrolled in business courses in the College of Business at Virginia Tech, Blacksburg, Virginia, participated in this experiment.

A lottery of \$100 was offered as an incentive to participate. In addition, some subjects were also offered extra credit for participating in the study.

To ensure equal cell sizes (for a balanced design), each subject's data collected at each session were examined to identify incomplete responses or any other problems with the data that may justify a subject's removal from the sample. The objective of this screening was to have the opportunity to replace discarded subjects in a cell with additional subjects in the next data collection session. Preliminary examination of this nature revealed no problems. Unfortunately, long after the data collection had been completed, 27 subjects had to be eventually discarded-- 20 had participated in an earlier pretest of the experiment and 7 subjects had, intentionally or unintentionally, not followed directions. A total of 153 usable responses were available for the final analyses. Results reported in the next chapter are therefore based on the analysis of a weakly unbalanced design (sizes of cells 1-6: 30, 22, 23, 30, 23, 25).

Using the method recommended by Rosenthal and Rosnow (1984) and the tables provided in Cohen (1977), power values were computed. For a total sample size of 150, power of the various effects is as follows (assuming a medium effect size with $f=0.25$):

Anchor context (main effect) = 0.85
Bundle context (main effect) = 0.77
Interaction = 0.77

The corresponding power values with a sample size of 180 would have been:

Anchor context (main effect) = 0.92
Bundle context (main effect) = 0.85
Interaction = 0.85

The average age of the subjects was 21.4 years. Of these 46.4% were marketing majors, the rest being non-marketing majors. Males and females accounted for 47.1% and 52.9% of the sample respectively. 40.2% of the subjects were juniors, the balance being seniors. Subjects took an average of 17.9 minutes (SD = 4.0) to complete their assigned experimental tasks.

PRELIMINARY ANALYSES

Before the data were analyzed for the specific purpose of testing the various hypotheses, several preliminary analyses were conducted. These analyses were designed to test the reliability of measures used in this investigation and also to conduct manipulation checks on variables of interest. The results of these preliminary analyses are now reported.

Reliability

The primary dependent variable of interest in this investigation was perceived quality of the overall bundle and of the individual items in the bundle. Recall that a 3-item measure was used to measure this dependent variable. Perceived knowledge about bundle items was also measured. Table 9 presents the reliability of these variables for the two bundles used as stimuli in this experiment. Panel A of the table provides information on the computer system while panel B pertains to the bedroom

TABLE 9
RELIABILITY OF THE PERCEIVED
QUALITY AND KNOWLEDGE MEASURES

Bundle and <u>its items</u>	Alpha	<u>Inter-item Correlations</u>		
		<u>Min.</u>	<u>Max.</u>	<u>Mean</u>
A. Computer Bundle	.95	.85	.90	.87
Computer	.96	.89	.93	.91
Printer	.87	.60	.75	.70
Printer Stand	.86	.66	.68	.67
<hr/>				
B. Bedroom Bundle	.94	.80	.89	.85
Bed	.99	.96	.97	.97
Chest	.89	.69	.77	.73
Night Stand	.91	.74	.82	.77
<hr/>				
C. Knowledge about the computer bundle Items	.81	.39	.66	.52
<hr/>				
D. Knowledge about the bedroom bundle Items	.82	.37	.63	.54
<hr/>				

bundle. Panels C and D pertain to the perceived knowledge measure for the two bundles.

Examining the Cronbach's alpha values of all bundles and their individual items indicated satisfactory reliability, with most values being greater than 0.85. Besides the alpha values, the inter-item correlation values are also reported. The magnitude of these correlation values serves as a useful diagnostic tool to identify potentially problematic items; low values of correlation between two items usually suggest that at least one of them may need further examination. The values reported in Table 9, however, are consistently high with the means being greater than 0.65.

Reliability of the knowledge scale was satisfactory too ($\alpha > 0.80$), though inter-item correlations tended to be low. Nevertheless, they were considered acceptable for the purpose of this investigation.

Manipulation Checks

Recall that the experimental design (shown in Figure 13) required bundles with items that were perceived to be different in terms of their relative salience. Specifically, one of the items should have been clearly predominant. In addition, descriptions of the items had to be developed such that the predominant item would either be perceived as excellent (in cells 1, 2, and 3) or poor (in cells 4, 5, and 6). Description of the non-anchor items had to be manipulated to be moderate (i.e., between the extremes represented by poor and excellent). As described earlier, manipulations of

this nature were required to test the averaging influence of the hypothesized anchoring and adjustment process.

Relative Saliency of Bundle Items

Recall that subjects in cells 2 and 5 of the experimental design evaluated bundles with only two items (computer bundle: computer and printer; bedroom bundle: bed and chest). The bundles evaluated in cells 3 and 6, however, had three items (computer bundle: computer, printer, and printer stand; bedroom bundle: bed, chest, and night stand). In each of these cells, subjects 1) distributed 100 points (on the basis of perceived importance) between the items of each bundle they evaluated and 2) estimated the average retail price of the items. These two pieces of information were used to develop two measures of relative saliency: 1) relative importance (points received by an item in a bundle), and 2) relative expensiveness (average retail price of an item expressed as a percentage of the total bundle price). Additionally, subjects ranked the items in the bundles in terms of perceived importance.

Table 10 shows these two measures for bundles in cells 2 and 5 of the design. In panel A, the computer received 59.6 points as compared to 40.4 points received by the printer. The relative expensiveness measure for the computer bundle also suggests that the computer was perceived to be the most salient item in the bundle. The same pattern of values are shown in panel B for the bedroom bundle.

TABLE 10
MEASURES OF RELATIVE SALIENCE FOR BUNDLES WITH
TWO ITEMS (CELLS 2 AND 5 OF THE DESIGN)

<u>Bundle and its items</u>	<u>Relative Importance</u>		<u>Relative Expensiveness¹</u>	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
A. Computer Bundle				
Computer	59.6	20.1	80.6	10.1
Printer	40.4	20.1	19.4	10.1
<hr/>				
B. Bedroom Bundle				
Bed	61.0	13.0	68.5	11.0
Chest	39.0	13.0	31.5	11.0
<hr/>				

¹Subject-stated retail price expressed as a % of the total bundle retail price

In cells 3 and 6 the relative salience measures for the various items were also as intended (see Table 11). In both the computer and the bedroom bundles, the anchor items (computer and bed) received more than half of the total points. Compared to the relative importance measure, the relative expensiveness measure tended to reflect the dominance of the anchor items even more. However, the general pattern of the two measures of salience was the same.

The aggregate results reported above clearly suggest that the items in the two bundles were perceived to be differentially salient. But how well do these results hold up at the level of the individual? In other words, for what percentage of the subjects was the rank ordering of relative salience measures as needed for the experiment? Table 12 presents this individual-level analysis for subjects in cells 2 and 5 (where the bundle had 2 items). For example, in panel A under the column labeled "Relative Importance," the percentage figures provide further support for the assertion that items were perceived to be differentially salient; the computer was ranked more salient by 73.3% of the subjects in cells 2 and 5. Results under the other two columns also exhibit the same characteristics. The same pattern of results also held for the bedroom bundle shown in panel B of the table.

Whereas Table 12 pertains to cells 2 and 5, Table 13 presents the corresponding statistics for cells 3 and 6 (where the bundle had 3 items). Again looking in panel A under the column labeled "Relative Importance", the computer is clearly ranked most salient followed (in decreasing order) by the printer and the printer stand. Values in panel B of the table

TABLE 11
MEASURES OF RELATIVE SALIENCE FOR
BUNDLES WITH THREE ITEMS
(CELLS 3 AND 6 OF THE DESIGN)

<u>Bundle and its items</u>	<u>Relative Importance</u>		<u>Relative Expensiveness¹</u>	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
A. Computer Bundle				
Computer	53.7	14.8	75.8	7.2
Printer	31.2	12.5	19.9	6.1
Printer Stand	15.1	14.5	4.3	3.0
<hr/>				
B. Bedroom Bundle				
Bed	51.7	9.0	61.2	10.0
Chest	29.6	7.2	27.4	8.7
Night Stand	18.7	7.1	11.3	3.8

¹Subject-stated retail price expressed as a % of the total bundle retail price.

TABLE 12
 RANKING OF RELATIVE IMPORTANCE AND
 RELATIVE EXPENSIVENESS FOR BUNDLES WITH
 TWO ITEMS (CELLS 2 AND 5 OF THE DESIGN)

Bundle and its items	Ranking ¹					
	Relative Importance ² (points)		Relative Importance ³ (ranking)		Relative Expensiveness ⁴	
	<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>
A. Computer Bundle						
Computer	73.3%	26.7%	84.4%	15.6%	100.0%	0.0%
Printer	26.7	73.3	15.6	84.4	0.0	100.0
B. Bedroom Bundle						
Bed	84.4	15.6	86.7	13.3	100.0	0.0
Chest	15.6	84.4	13.3	86.7	0.0	100.0

¹% times Relative Importance and Relative Expensiveness were ranked 1 or 2 (1 = most important/expensive; 2 = least important/expensive)

²based on importance points

³based on ranking

⁴based on subject-stated retail price expressed as a % of the total bundle retail price

TABLE 13
RANKING OF RELATIVE IMPORTANCE AND
RELATIVE EXPENSIVENESS FOR BUNDLES WITH
THREE ITEMS (CELLS 3 AND 6 OF THE DESIGN)

Bundle and its items	Relative Importance ² (points)			Relative Importance ³ (ranking)			Relative Expensiveness ⁴		
	1	2	3	1	2	3	1	2	3
A. Computer Bundle									
Computer	77.1%	22.9%	0.0%	97.9%	2.1%	0.0%	100.0%	0.0%	0.0%
Printer	22.9	77.1	0.0	6.3	93.8	0.0	0.0	100.0	0.0
Printer Stand	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	100.0%
B. Bedroom Bundle									
Bed	81.3	18.8	0.0	95.8	2.1	2.1	93.8	6.3	0.0
Chest	19.7	81.3	0.0	4.2	89.6	6.2	6.3	93.8	0.0
Night Stand	0.0	0.0	100.0	0.0	8.3	91.7	0.0	0.0	100.0

¹% times Relative Importance and Relative Expensiveness are ranked 1, 2, or 3 (1 = most important/expensive; 3 = least important/expensive)

²based on importance points

³based on ranking

⁴based on subject-stated retail price expressed as a % of the total bundle retail price

suggest that the bed is perceived to be the most salient item, followed (in decreasing order of importance) by the chest and the night stand.

And, finally, what is the degree of consistency (across subjects) with which the various items in a bundle were ranked in terms of their relative salience measure? The statistic Kendall's W, computed for each of the three relative salience measures, provides a numerical measure of this consistency. The values of W ranged from a low of 0.47 to a high of 1.0. In general, high values of W were obtained, indicating that rank ordering of the relative salience measure of items in the two bundles was not significantly different across subjects.

Perceived Quality of Bundle Items

Recall that the experimental factor anchor context had two levels: poor and excellent. These two levels determined whether the anchor item's description was manipulated to be perceived as either poor or excellent. In all cells of the experimental design, the non-anchor items' descriptions were manipulated to suggest a moderate-quality level. The purpose of the manipulation checks was to ensure that the descriptions of the anchor and non-anchor items were indeed perceived as intended.

Table 14 presents the mean values of the perceived quality measure for the items. The poor manipulation resulted in a mean score of 1.77 for the bed and 2.08 for the computer. The low and high scores for each bundle were also statistically different (computer: $t(151) = 34.88$, $p = .00$; bed: $t(151) = 51.90$, $p = .00$). The mean scores for the other non-

TABLE 14
MANIPULATION CHECKS OF PERCEIVED QUALITY

<u>Bundle and its items</u>	<u>Perceived Quality</u> ¹	
	<u>Mean</u>	<u>SD</u>
A. Computer Bundle		
Computer (poor)	2.08	0.83
Computer (excellent)	6.18	0.60
Printer	4.15	0.89
Printer Stand	3.78	0.89
<hr/>		
B. Bedroom Bundle		
Bed (poor)	1.77	0.67
Bed (excellent)	6.57	0.45
Chest	3.30	0.82
Night Stand	3.80	0.89

¹Based on a 3-item/7-point rating scale

anchor items ranged from 3.3 to 4.5; on a 7-point rating scale (with 4 as the mid-point), a moderate manipulation should fall in the mid-section of the scale. Mean scores of the non-anchor items were indeed as intended.

Randomization Checks and Potential Confounds

Several randomization checks were conducted to isolate potential rival hypotheses. Subjects who participated in this experiment were selected from a pool that was considered to be largely homogeneous along the dimensions relevant to this research (e.g., knowledge about the stimuli). Additionally, subjects were assigned randomly to the six treatment cells of the experimental design to ensure the randomization (across cells) of the non-theoretical variables. Analyses to test the randomization are now reported.

Randomization across cells was ascertained for the following non-theoretical variables: sex, major (marketing or non-marketing), class standing (junior or senior), and age of the subject. Analyses indicated that the randomization procedures were largely successful (sex: Chi-Square (5)= 5.78, $p = 0.33$; major : Chi-Square (5)= 63.14, $p = 0.00$; class standing: Chi-Square (3) = 2.74, $p = 0.43$).⁹ Analysis of variance with age as the dependent variable found that the two main effects and the

⁹ Inadvertently, data on the class standing of the subjects in cells 1 and 4 was lost during analysis. Hence, Chi-Square for this variable is reported for subjects only in the remaining four cells. Marketing and non-marketing majors were, obviously, not successfully randomized across cells. This issue is discussed shortly.

interaction were non-significant (anchor context: $F(1,147) = 0.79$, $p = 0.38$; bundle context (2, 147) = 0.89, $p = 0.41$; interaction: $F(2,147) = 0.28$, $p = 0.28$).

In addition to checking whether the randomization procedures had worked, the mean scores of the evaluations (of bundles and items) were compared for different values of the potentially confounding variables mentioned above. The results of comparing these mean scores are reported in Table 15. First note that marketing and non-marketing majors did not have significantly different evaluations. This is reassuring because, as reported in the above paragraph, marketing and non-marketing majors were not successfully randomized across the treatment cells (Chi-Square (5) = 63.14, $p = .00$).

As can also be seen from the table, subjects' class standing, and perceived knowledge about the items, did not significantly affect the various evaluations they made. However, several evaluations were significantly different for males and females. Further analyses of males and females indicated that females, in general, tended to have lower evaluations than the males. However, even if some (unexplained) evaluation differences may exist between men and women, randomization of males and females across the treatment cells was successful (Chi-Square (5) = 5.78, $p = .33$) and therefore should not lead to any systematic contamination of the results.

TABLE 15
CHECKING FOR POTENTIAL CONFOUNDING INFLUENCES

P-values¹

<u>Item</u>	<u>Sex</u> <u>(Male/Female)</u>	<u>Major</u> <u>(Marketing/</u> <u>Non-Marketing)</u>	<u>Class</u> <u>(Junior/Senior)</u>	<u>Knowledge</u> <u>(Low/High)¹</u>
Computer Bundle	0.06	0.88	0.88	0.70
Computer	0.09	0.85	0.36	0.56
Printer	0.01	0.02	0.03	0.07
Printer Stand	0.38	0.73	0.72	0.11
Bedroom Bundle	0.02	0.64	0.64	0.92
Bed	0.05	0.92	0.58	0.23
Chest	0.01	0.32	0.14	0.54
Night Stand	0.71	0.69	0.84	0.17

Note: Differences in the overall computer and bedroom bundle evaluations are based on responses in cells 2, 3, 5, and 6 of the experimental design. Cells 1 and 4 are not included because overall bundle evaluations were not made in these cells. The p-values for individual items are based on the full sample (i.e., all cells of the experimental design).

¹Based on median split

Summary of Preliminary Analyses

The purpose of this section was to present the results of the preliminary analyses that were conducted. These analyses pertained to 1) reliability of the measures, and 2) manipulation checks. Reliability of all measures were found to be satisfactory. Two types of manipulation checks were performed: 1) assessing the relative salience of the bundle items, and 2) assessing the effectiveness of the product descriptions. Both aggregate and individual-level analyses indicated that the relative salience of the items was as intended--the items were perceived to be differentially salient and had one dominant item. Analyses of the perceived quality measure found that the "poor" and "excellent" manipulations of the anchor items (bed and computer) were in the intended directions, and that they were statistically different. The descriptions of the non-anchor items were successfully manipulated to suggest moderate quality. Chi-Square tests indicated that non-theoretical variables (e.g., sex, major) were successfully randomized across the treatment cells.

TESTING THE ANCHORING AND ADJUSTMENT HYPOTHESES

The anchoring and adjustment conceptualization developed in Chapter II pertains to two important propositions. First, evaluation of a bundle using anchoring and adjustment begins with the selection and evaluation of the most important item. All or some of the remaining items are then examined and evaluated in the order of decreasing importance. This proposition related to the examination and evaluation of bundle items was

articulated in H1 and H2. The second important proposition developed earlier pertains to the nature of information integration. In the context of forming overall evaluations based on the sequential evaluation of individual items, it was argued that one consequence of the anchoring and adjustment process is averaging; that is, the overall evaluation was predicted to be a weighted average of the individual items' evaluations (H3). And, finally, it was also argued that the evaluation of the most important item (termed the anchor evaluation) would influence evaluations of the other items in a bundle (H4, H5a, H5b). In this section, these hypotheses are formally tested.

Order of Bundle Items' Examination (H1, H2)

Predictions. The experimental factor bundle context had three levels represented earlier as: 1) A, B, C, 2) (A +B), C, and 3) (A + B + C); A, B, and C are the individual items contained in any one bundle. Hence these three levels of this experimental factor provided several different evaluative contexts. Starting with the premise that items perceived to be more important are examined and evaluated first (H1, H2), what specific predictions can be made at different levels of the factor bundle context?

As overall bundle evaluations were made only in those cells where the factor bundle context is either (A+B), C or (A+B+C), predictions about the order of bundle items' examination are relevant only in these evaluation situations (i.e., cells 2, 3, 5, and 6; see Figure 13). If the relative salience of item A is the greatest and followed (in decreasing

order) by items B and C, the following predictions can be made: 1) when the evaluated bundle is (A+B), item A should be examined prior to item B, and 2) when the evaluated bundle is (A+B+C), item A should be examined first, followed in order by the examination of items B and C.

Results. To test these predictions, the order in which bundle items were examined by subjects was analysed in cells 2, 5, 3, and 6 of the experimental design. Panels A and B of Table 16 show the order in which bundle items were examined by subjects; panel A pertains to the bundles with two items (cells 2 and 5 of the design), whereas panel B presents information on bundles with three items (cells 3 and 6 of the design). For evaluations of the computer system, the computer was examined first by 88.6% of the subjects, while 11.4% of the subjects examined the printer first (see Table 16, panel A). The corresponding figures for the bed and chest (in the bedroom furniture bundle) were 81.8% and 18.2%, respectively. By random chance alone, each of these items in the bundles could have been chosen only by 50% of the subjects. Spearman's rank order correlations between perceived importance of bundle items and their order of examination were as follows: computer bundle (0.58, $p = .00$); bedroom bundle (0.67, $p = .00$). It was therefore concluded that subjects did not examine the bundle items randomly; instead, important items tended to be examined prior to the less important items.

Panel B of Table 16 shows that the same pattern of information acquisition was followed by subjects in cells 3 and 6 where the bundles had three items. For example, during the evaluation of the computer bundle, the computer was examined first by 82.9% of the subjects. The printer and

TABLE 16
ORDER IN WHICH ITEMS WERE EXAMINED BY SUBJECTS

A. Bundles With Two Items

<u>Bundle and its items</u>	<u>Order of Examination</u> <u>(% of subjects)</u>	
	<u>1</u>	<u>2</u>
Computer Bundle		
Computer	88.6%	11.4%
Printer	11.4	88.6
Bedroom Bundle		
Bed	81.8	18.2
Chest	18.2	81.8

B. Bundles With Three Items

<u>Bundle and its items</u>	<u>Order of Examination</u> <u>(% of subjects)</u>		
	<u>1</u>	<u>2</u>	<u>3</u>
Computer Bundle			
Computer	82.9%	7.3%	9.8%
Printer	7.3	82.9	9.8
Printer Stand	9.8	9.8	80.5
Bedroom Bundle			
Bed	84.8	8.7	6.5
Chest	6.5	71.7	21.7
Night Stand	8.7	19.5	71.7

printer stand were examined second and third in sequence on 82.9% and 80.5% of the occasions. Numbers for the bedroom bundle also exhibit the same characteristics. Note that, for the situation where a bundle had three items, the random-chance probability of being chosen first, second, or third is 33.33%. Spearman's rank order correlation between perceived importance of bundle items and their order of examination was 0.75 ($p = .00$) for items in both the computer bundle and the bedroom bundle.

To determine the degree of agreement across subjects regarding the order in which bundle items were examined, Kendall's W was computed using items' order of examination as the dependent variable. Kendall's W ranged from 0.40 to 0.58 and χ^2 s corresponding to the W s were significant ($p = .00$), suggesting that there was agreement across subjects.

Conclusion. Based on the evidence reported above, it was concluded that items of the bundle items were not examined randomly, but in the decreasing order of their perceived importance. This evidence supports hypotheses 1 and 2 that bundle items will be examined in the decreasing order of perceived importance.

Nature of Overall Bundle Evaluations (H3)

In the conceptual arguments presented in Chapter II, the anchoring and adjustment process was characterized in great detail. In the context of evaluating a bundle of items, this process can be summarized as follows: 1) an initial evaluation is made based usually on the item that is perceived to be most important, 2) remaining items are sequentially

examined and evaluated and the initial bundle evaluation is adjusted to reflect these subsequent evaluations. One important consequence of this adjustment process is that the overall evaluation tends to become a weighted average of the evaluations of the individual items (H3). This section discusses the results of different approaches that were used to test this hypothesis.

Comparison of Anchor and Bundle Evaluations

Predictions. If the averaging argument holds, what specific predictions can be made about the relationship between the evaluations of the anchor (i.e., the most important item) and the overall bundle evaluation? Referring to the experimental design (Figure 13), it can be seen that the anchor description in cells 1, 2, and 3 was manipulated to be "excellent"; in cells 4, 5, and 6 the description was "poor." Recall that subjects in cells 1 and 4 did not make overall bundle evaluations. Instead, they examined and evaluated items individually.

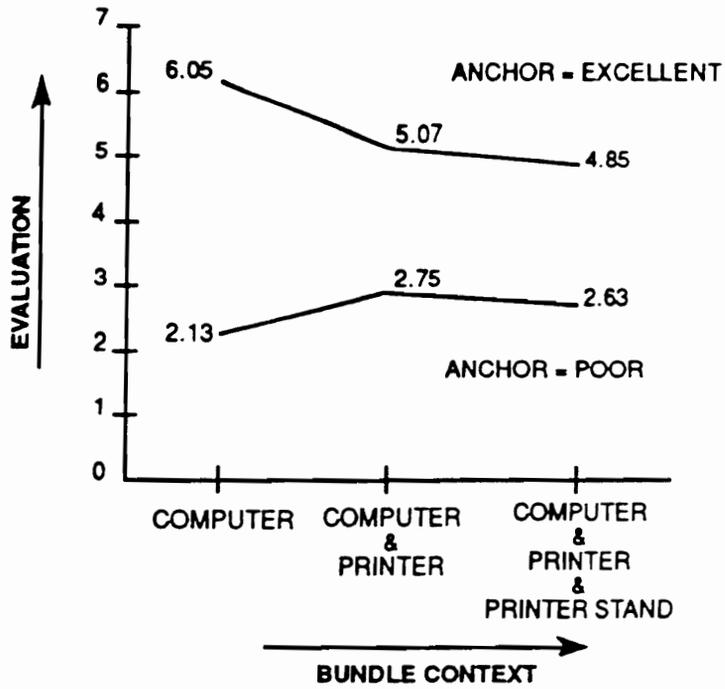
Hence, the following data from the six cells of the experimental design was available for analysis: 1) evaluations of the anchor items (computer and bed) in cells 1 and 4, 2) evaluations of 2-item bundles in cells 2 and 5 (computer system: computer and printer; bedroom bundle: bed and chest), and 3) evaluations of 3-item bundles in cells 3 and 6 (computer system: computer, printer, printer stand; bedroom bundle: bed, chest, nightstand). If bundle evaluations are weighted averages of the individual item evaluations, an "excellent" anchor combined with "moder-

ate" other items should pull up the overall bundle evaluation (cells 1, 2, 3). In contrast, a "poor" anchor combined with the same "moderate" other items should reduce the overall evaluations of the bundle (cells 4, 5, 6).

Aggregate Results. Panels A and B of Figure 21 show that predictions based on the averaging hypothesis are supported. In panel A, data for the computer bundle are reported. On the horizontal axis, the three evaluation contexts pertaining to the three levels of the experimental factor bundle context are shown. The upper curve captures the downward averaging trend in cells 1, 2 and 3. The lower curve shows how averaging pulls up the bundle evaluation in cells 4, 5, and 6. However, the rate of decrease in the upper curve and the rate of increase in the lower curve appears to diminish almost completely as the bundle size increases from two items to three. This result may be attributed to the fact that the third item was not perceived as very important in relation to the other two items in the bundle. The pattern of results for the bedroom bundle shown in panel B is very similar to the results for the computer bundle.

Individual-level Results. The hypothesized averaging influence appears to hold at the aggregate level. But is there evidence that an averaging process occurs at the level of the individual? The specific predictions are: 1) in cells 2 and 3 bundle evaluation < anchor evaluation, and 2) in cells 4 and 5 bundle evaluation > anchor evaluation. Table 17 shows the percentage of subjects in various cells of the experimental design whose behavior was (and was not) consistent with the averaging hypothesis.

A. COMPUTER BUNDLE



B. BEDROOM BUNDLE

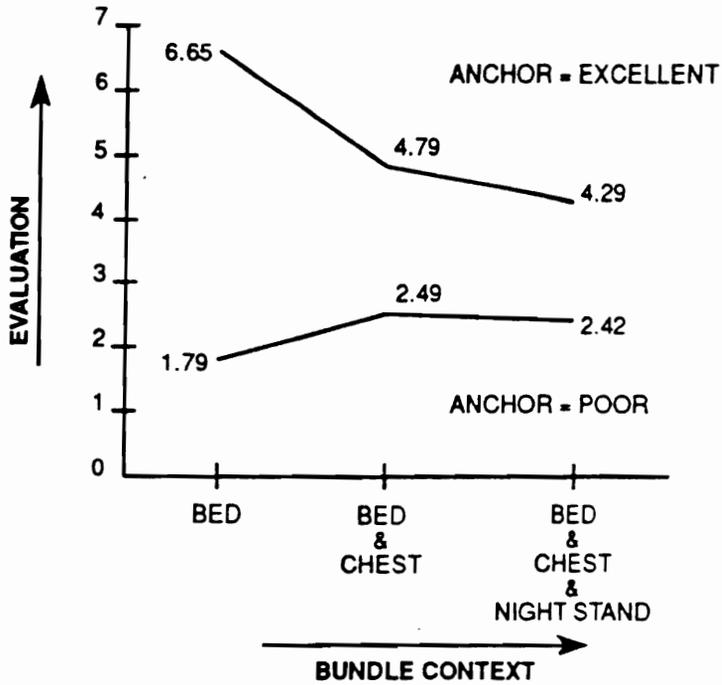


FIGURE 21. MEAN PLOTS FOR THE COMPUTER AND BEDROOM BUNDLES

TABLE 17
INDIVIDUAL-LEVEL ANALYSIS OF THE
RELATIONSHIP BETWEEN OVERALL BUNDLE
EVALUATION AND ANCHOR EVALUATION

<u>Relationship</u>	<u>% Occurrence in Cell #</u>			
	<u>2</u> (Anchor=Excellent)	<u>3</u>	<u>5</u> (Anchor=Poor)	<u>6</u>
1. Bundle evaluation <u>greater</u> than anchor evaluation:				
Computer Bundle	0.0	4.3	69.6	76.0
Bedroom Bundle	0.0	0.0	87.0	88.0
2. Bundle evaluation <u>less</u> than anchor evaluation:				
Computer Bundle	100.0	95.7	21.7	20.0
Bedroom Bundle	100.0	100.0	13.0	4.0
3. Bundle evaluation <u>equal</u> to anchor evaluation				
Computer Bundle	0.0	0.0	8.7	4.0
Bedroom Bundle	0.0	0.0	0.0	8.0

Looking down under the columns for cells 2 and 3, a majority of the subjects rated (as predicted) the bundle evaluation less than the anchor evaluation. In cells 5 and 6, the pattern of results was opposite as expected. However, results in cells 5 and 6 were not as strongly supportive as those in cells 2 and 3. It appears that the detrimental effect of moderate items on good anchors (perceived as "loss") is more than their enhancing effect on poor anchors (perceived as "gain"). These results are consistent with the notion that the impact of losses is greater than the impact of perceived gains (Kahneman and Tversky 1979; see also Klein and Oglethorpe 1987).

Analysis of Variance Approach

Predictions. Another way of testing the averaging hypothesis at the aggregate level is to look at the trends in Figure 21 from an analysis of variance point of view. As shown in this figure, the incremental influence of adding more items to an anchor item depends on the evaluation of the anchor item. If the anchor is perceived to be "excellent", adding "moderate" items pulls down the bundle evaluation. The effect is the very opposite when the anchor evaluation is "poor." From an analysis of variance perspective, this suggests a strong interaction effect between the two factors of the experimental design.

Results. The analysis of variance results presented in Table 18 show that the predicted interaction effect is supported ($p = .000$, effect size η^2 is 0.20 for the computer bundle and 0.52 for the bedroom bundle). A key

assumption made in an analysis of variance is homogeneity of variance, implying that the variance of the dependent variable is statistically the same in all the cells. For balanced designs, results are robust against violations of this assumption. However, for unbalanced designs, violations of the homogeneity assumption can lead to erroneous conclusions based on the analysis of variance results. As the present design was weakly unbalanced, this assumption was explicitly tested. The Bartlett-Box tests shown in panels A and B of the table were not significant, implying that the variance of the dependent variables in the cells was statistically homogeneous. Hence, conclusions based on the reported analysis of variance results are not erroneous.

Given the interaction effect between anchor context and bundle context, simple effects were also analyzed and are reported in Table 19. At each level of the factor anchor context, tests of a linear trend were significant at the .05 level. Duncan's multiple range tests showed several inter-cell differences as expected. However, it appears that addition of the third item had only a marginal to no influence in both bundles.

Regression Approach

Statistical Test Employed. The assertion of hypothesis 3, that the overall evaluation of a bundle is a weighted average of its individual items' evaluations was also tested using a regression approach. To illustrate how this approach was used, consider the computer bundle in cells 2 and 5 which had the following two items: personal computer and printer.

TABLE 18
RESULTS OF THE ANALYSIS OF VARIANCE

A. Computer Bundle

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>p</u>	<u>(eta)²</u>
Anchor	300.19	1	300.19	443.0	.000	0.75
Context	3.22	2	1.61	2.38	.096	0.03
Anchor x Context	25.10	2	12.55	18.52	.000	0.20
Error	99.61	147	0.68			

Homogeneity of Variance Test:

Bartlett - Box $F(5,26814) = 1.34, p = .245$

B. Bedroom Bundle

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>p</u>	<u>(eta)²</u>
Anchor	339.93	1	339.93	770.38	.000	.84
Context	21.12	2	10.56	23.93	.000	.25
Anchor x Context	71.61	2	35.81	81.15	.000	.52
Error	64.86	147	0.44			

Homogeneity of Variance Test:

Bartlett-Box $F(5,26814) = 1.47, p = 0.198$

TABLE 19
TESTS OF SIMPLE EFFECTS

<u>Bundle</u>	<u>Anchor Context</u>	<u>Contrast Test for Linear Trend</u>	<u>Pairs of Cells Different Based on Duncan's Test¹</u>
Computer Bundle	Excellent	t(72) = -6.26, p = .00	(1,2); (1,3)
	Poor	t(75) = 2.01, p < .05	(4,5)
Bedroom Bundle	Excellent	t(72) = -13.45, p = .00	(1,2); (1,3); (2,3)
	Poor	t(75) = 3.36, p = .00	(4,5); (4,6)

¹Duncan's multiple range test is reported at the .05 level

Because the overall evaluation of the computer bundle is hypothesized to be influenced by evaluations of the individual items:

$$E_o = aE_{cm} + bE_{pt}, \text{ where}$$

E_o = overall evaluation of the computer bundle,

E_{cm} = evaluation of the personal computer, and

E_{pt} = evaluation of the printer.

If the weighted-average argument is valid, a and b in the above equation should sum to 1.0. Substituting $a = 1-b$ yields another algebraic form:

$$E_o - E_{cm} = b(E_{pt} - E_{cm})$$

Let's refer to the first formulation as model 1 and the second formulation as model 2. Then testing these two models as competing regression equations can serve as a test of the weighted average hypothesis. Chatterjee and Price (1977, pp. 66-68) suggest the following test of the hypothesis that $a + b = 1$:

$$F(n_1, n_2) = \frac{(R_1^2 - R_2^2)/n_1}{(1 - R_1^2)/n_2}$$

where

R_i^2 = square of the multiple R for model i, $i = 1, 2$ and

n_1 = (# of parameters estimated in model 1) - (# of parameters estimated in model 2)

n_2 = (# of observations) - (# of parameters to be estimated in model 1)

If the F statistic turns out to be significant, it implies that the hypothesis $a + b = 1$ is not supported. Intuitively, this F test measures

the spread between the R^2 s of the two models. As $R_1^2 - R_2^2$ becomes large, the implication is that the constraint $a + b = 1$ is too restrictive and reduces the fit of the regression model. In contrast if the F test is not significant, the hypothesis $a + b = 1$ is supported.

Although the arguments presented above are in the context of a 2-item bundle, the model formulation and the statistical test extends in a similar way to bundles with three items (for cells 3 and 6). The following nomenclature is used in Tables 20-23 which are discussed below:

E_O = overall evaluation of the bundle of items,

E_{cm} = evaluation of the personal computer,

E_{pt} = evaluation of the printer,

E_{ps} = evaluation of the printer stand,

E_{bd} = evaluation of the bed,

E_{ch} = evaluation of the chest, and

E_{ns} = evaluation of the nightstand.

Tests of the Weighted-Average Hypothesis. Table 20 presents regression estimates of two models for the 2-item computer bundle. Panel A has the results for the unrestricted model; panel B has the corresponding estimates for the restricted model. As can be observed, imposing the restriction $a + b = 1$ leads to a reduction in R^2 from .76 to .70. The F statistic to test the hypothesis $a + b = 1$ will be discussed shortly. Results of similar regression runs for the other bundles used in this experiment are reported in Table 21 (2-item bedroom bundle), Table 22

TABLE 20
REGRESSION ANALYSIS OF THE COMPUTER
BUNDLE WITH TWO ITEMS

A. MODEL #1 (full; $a + b \neq 1$)

Equation: $E_o = K + aE_{cm} + bE_{pt}$

<u>Source</u>	<u>SS</u>	<u>MS</u>	<u>DF</u>	<u>F(2,42)</u>	<u>p</u>
Regression	70.71	35.36	2	68.85	.000
Error	21.56	0.51	42		

$R^2 = 0.7663$

<u>Coefficient</u>	<u>Estimate</u>	<u>t</u>	<u>p</u>
b	0.37	3.40	.001
a	0.55	11.33	.000
(K)	0.13	0.27	.787

B. MODEL #2 (restricted; $a + b = 1$)

Equation: $E_o - E_{cm} = K + b(E_{pt} - E_{cm})$

<u>Source</u>	<u>SS</u>	<u>MS</u>	<u>DF</u>	<u>F(1,42)</u>	<u>p</u>
Regression	52.07	52.07	1	102.69	.000
Error	21.80	0.51	43		

$R^2 = 0.7049$

<u>Coefficient</u>	<u>Estimate</u>	<u>t</u>	<u>p</u>
b	0.44	10.13	.000
(K)	-0.19	-1.80	.078

TABLE 21
REGRESSION ANALYSIS OF THE BEDROOM
BUNDLE WITH TWO ITEMS

A. MODEL #1 (full; $a + b \neq 1$)

Equation: $E_o = K + aE_{bd} + bE_{ch}$

<u>Source</u>	<u>SS</u>	<u>MS</u>	<u>DF</u>	<u>F(2,42)</u>	<u>p</u>
Regression	71.55	35.78	2	133.55	.000
Error	11.25	0.27	42		

$R^2 = 0.8641$

<u>Coefficient</u>	<u>Estimate</u>	<u>t</u>	<u>p</u>
b	0.50	4.83	.000
a	0.50	15.98	.000
(K)	-0.17	-0.44	.666

B. MODEL #2 (restricted; $a + b = 1$)

Equation: $E_o - E_{bd} = K + b(E_{ch} - E_{bd})$

<u>Source</u>	<u>SS</u>	<u>MS</u>	<u>DF</u>	<u>F(1,42)</u>	<u>p</u>
Regression	77.06	77.06	1	294.50	.000
Error	11.25	11.25	43		

$R^2 = 0.8726$

<u>Coefficient</u>	<u>Estimate</u>	<u>t</u>	<u>p</u>
b	0.50	17.16	.000
(K)	-0.16	-1.95	.058

TABLE 22
REGRESSION ANALYSIS OF THE COMPUTER
BUNDLE WITH THREE ITEMS

A. MODEL #1 (full; $a + b + c \neq 1$)

Equation: $E_o = K + aE_{cm} + bE_{pt} + cE_{ps}$

<u>Source</u>	<u>SS</u>	<u>MS</u>	<u>DF</u>	<u>F(3,44)</u>	<u>p</u>
Regression	67.02	22.34	3	42.86	.000
Error	22.73	0.52	44		

$R^2 = 0.7451$

<u>Coefficient</u>	<u>Estimate</u>	<u>t</u>	<u>p</u>
c	.10	0.75	.456
b	.33	2.45	.018
a	.51	9.19	.000
(K)	.01	0.01	.991

B. MODEL #2 (restricted; $a + b + c = 1$)

Equation: $E_o - E_{cm} = K + b(E_{pt} - E_{cm}) + c(E_{ps} - E_{cm})$

<u>Source</u>	<u>SS</u>	<u>MS</u>	<u>DF</u>	<u>F(2,45)</u>	<u>p</u>
Regression	60.56	30.28	2	59.18	.000
Error	23.02	0.51	45		

$R^2 = 0.7245$

<u>Coefficient</u>	<u>Estimate</u>	<u>t</u>	<u>p</u>
c	0.14	1.32	.195
b	0.35	2.76	.008
(K)	-0.23	-2.06	.046

(3-item computer bundle), and Table 23 (3-item bedroom bundle).¹⁰ Results from Tables 20-23 are summarized in Tables 24a and 24b. The F statistic to test the weighted-average hypothesis ($a + b = 1$; $a + b + c = 1$) are reported for each bundle in the last column of the table. Recall that large (positive) values of F lead to a rejection of the weighted average hypothesis. Examining the F values indicates that this hypothesis was rejected ($p < .005$) only for one bundle (computer and printer). For all other bundles, the weighted-average hypothesis was supported at $p < .05$. This implies that, for bundles employed as stimulus in this experiment, overall evaluation of the bundles was a weighted average of the bundle items' evaluations.

Comparison of Importance and Evaluative Weights. Recall that two measures of relative salience were obtained from each subject for the bundle items they evaluated. These measures were relative importance (in which subjects distributed 100 points between the items) and relative expensiveness (operationalized as the subject-stated retail price of an item expressed as a percentage of the total bundle retail price). In the regression analyses reported above, the coefficients (a, b, and c) of the independent variables also capture the sensitivity of the overall bundle evaluation to the individual items' evaluations; larger coefficients imply greater sensitivity. Did subjects, in the aggregate, have insight into

¹⁰ It should be noted that, in model 2 of Tables 22 and 23, correlations between the independent variables were quite high (0.93 and 0.94 respectively). Because multicollinearity can often lead to unstable regression coefficients, the results reported here for 3-item bundles should be viewed with caution.

TABLE 23
REGRESSION ANALYSIS OF THE BEDROOM
BUNDLE WITH THREE ITEMS

A. MODEL #1 (full; $a + b + c \neq 1$)

Equation: $E_o = K + aE_{bd} + bE_{ch} + cE_{ns}$

<u>Source</u>	<u>SS</u>	<u>MS</u>	<u>DF</u>	<u>F(3,44)</u>	<u>p</u>
Regression	53.47	17.82	3	70.48	.000
Error	11.13	0.26	44		

$R^2 = 0.8278$

<u>Coefficient</u>	<u>Estimate</u>	<u>t</u>	<u>p</u>
c	0.14	1.41	.164
b	0.42	4.44	.001
a	0.39	12.87	.000
(K)	-0.03	-0.07	.942

B. MODEL #2 (restricted; $a + b + c = 1$)

Equation: $E_o - E_{bd} = K + b(E_{ch} - E_{bd}) + c(E_{ns} - E_{bd})$

<u>Source</u>	<u>SS</u>	<u>MS</u>	<u>DF</u>	<u>F(2,45)</u>	<u>p</u>
Regression	109.87	54.94	2	221.17	.000
Error	11.18	0.25	45		

$R^2 = 0.9077$

<u>Coefficient</u>	<u>Estimate</u>	<u>t</u>	<u>p</u>
c	0.15	2.52	.049
b	0.45	5.33	.000
(K)	-0.19	-2.38	.022

TABLE 24a
COMPARISON OF ALTERNATIVE MODELS

<u>2-item Bundles</u>	<u>Fitted Regression Equation</u>	<u>F(n₁, n₂)¹</u>
A. Computer and Printer		
Model 1 (full):	$E_o = 0.13 + 0.55 E_{cm} + 0.37 E_{pt}$ $R^2 = 0.7663$	$F(1, 42) = 11.03^*$
Model 2 (restricted):	$E_o = -0.19 + 0.56 E_{cm} + 0.44 E_{pt}$ $R^2 = 0.7049$	
<hr/>		
B. Bed and Chest		
Model 1 (full):	$E_o = -0.17 + 0.50 E_{bd} + 0.50 E_{ch}$ $R^2 = 0.8641$	$F(1, 42) = -2.63$
Model 2 (restricted):	$E_o = -0.16 + 0.50 E_{bd} + 0.50 E_{ch}$ $R^2 = 0.8726$	

* $p < 0.005$

$${}^1F(n_1, n_2) = \frac{(R_1^2 - R_2^2)/n_1}{(1 - R_1^2)/n_2}, \text{ where}$$

R_i^2 = square of multiple R for model i

n_1 = (# of parameters to be estimated in model 1) - (# of parameters to be estimated in model 2)

n_2 = (# of observations) - (# of parameters to be estimated model 1)

TABLE 24b
COMPARISON OF ALTERNATIVE MODELS

<u>3-item Bundles</u>	<u>Fitted Regression Equation</u>	<u>F(n₁, n₂)¹</u>
A. Computer, Printer and Printer Stand		
Model 1 (full):	$E_o = 0.01 + 0.51 E_{cm} + 0.33 E_{pt} + 0.10 E_{ps}$ $R^2 = 0.7451$	$F(1,44) = 3.56$
Model 2 (restricted):	$E_o = -0.23 + 0.51 E_{cm} + 0.35 E_{pt} + 0.14 E_{ps}$ $R^2 = 0.7245$	
<hr/>		
B. Bed, Chest, and Night Stand		
Model 1 (full):	$E_o = -0.03 + 0.39 E_{bd} + 0.42 E_{ch} + 0.14 E_{ns}$ $R^2 = 0.8278$	$F(1,44) = -20.42$
Model 2 (restricted):	$E_o = -0.19 + 0.39 E_{bd} + 0.45 E_{ch} + 0.16 E_{ns}$ $R^2 = 0.9077$	

* $p < 0.005$

$${}^1F(n_1, n_2) = \frac{(R_1^2 - R_2^2)/n_1}{(1 - R_1^2)/n_2}, \text{ where}$$

R_i^2 = square of multiple R for model i

n_1 = (# of parameters to be estimated in model 1) - (# of parameters to be estimated in model 2)

n_2 = (# of observations) - (# of parameters to be estimated model 1)

their own evaluation processes? This question was addressed by comparing the regression weights for items in a bundle with the aggregate relative salience measures for that item.

Results of this analysis are shown in Table 25. In terms of rank ordering, the evaluative weights were the same across all columns of the table. However, it was observed that regression weights for the most important item in each bundle (i.e., the anchor) were always less than the corresponding relative salience measures (namely, relative importance and relative expensiveness). The relative importance weights, as compared to the relative expensiveness weights, seemed to have a better correspondence with the regression weights.

Influence of Anchor on Evaluation of other Items (H4, H5a, H5b)

Predictions. Because of its greater relative salience, the anchor was hypothesized to be the first item to be examined and evaluated (H1 and H2). As a consequence, it was argued, the anchor item would serve as a reference against which the other items in the bundle are evaluated and would influence their evaluations (H4). The resultant assimilation or contrast effects could pull a bundle item's evaluation either away or toward the anchor evaluation (H5a and H5b). Because the anchor description was manipulated to be either excellent (in cells 1, 2, 3) or poor (in cells 4, 5, 6) and the non-anchor items were manipulated to be of moderate quality in all cells, contrast effects were expected in this research.

TABLE 25
COMPARISON OF EVALUATIVE WEIGHTS

A. Bundle With Two Items

<u>Item</u>	<u>Regression Weight¹</u>	<u>Relative Importance Weight</u>	<u>Relative Expensiveness Weight</u>	<u>Composite Weight²</u>
Computer	0.55	0.60	0.81	0.70
Printer	0.37	0.40	0.19	0.30
<hr/>				
Bed	0.50	0.61	0.69	0.65
Chest	0.50	0.39	0.31	0.35

B. Bundle With Three Items

Computer	0.51	0.54	0.76	0.65
Printer	0.33	0.31	0.20	0.26
Printer Stand	0.10	0.15	0.04	0.09
<hr/>				
Bed	0.39	0.52	0.61	0.56
Chest	0.42	0.30	0.27	0.29
Night Stand	0.14	0.18	0.11	0.15

¹Based on the full model (sum of regression coefficients \neq 1)

²Computed as mean of the relative importance and relative expensiveness weights.

The net result of this contrast effect would be: 1) when the anchor item was manipulated to be excellent (in cells 2 and 3), the moderate evaluations of the non-anchor items would be biased toward the negative side of the evaluation scale, and 2) when the anchor item was manipulated to be poor (in cells 5 and 6), the moderate evaluations of the non-anchor items would be biased toward the positive side of the evaluation scale. Taken together, 1) and 2) imply that though identical descriptions of the non-anchor items were seen by all subjects, their mean evaluations in cells 4 and 6 (anchor = poor) would be better than those in cells 2 and 3 (anchor = excellent). Results of testing this hypothesis are now reported.

Results. The evidence supporting these arguments was, at best, weak (see Table 26). Of the four non-anchor items, H5a was supported only for one (printer stand). Evaluation of this item was 3.99 when the anchor was poor, compared to 3.42 when the anchor was excellent. Obviously, the two different anchor evaluations tended to push the non-anchor items' assessments (manipulated to be moderate) in opposite directions along the evaluation scale. However, the hypothesis was statistically supported only for one bundle item (printer).

The evidence, obviously, is poor. Though only one (out of four) differences turned out to be statistically significant, effect size (d) ranged from small to medium (printer: 0.07; printer stand: 0.67; chest: 0.10; nightstand: 0.22). These effect sizes are still substantial given the fact that the evaluations of the non-anchor items were based on descriptions that made a liberal use of adjectives and phrases such as

TABLE 26
INFLUENCE OF ANCHOR ON THE EVALUATION
OF OTHER ITEMS OF A BUNDLE

<u>Bundle and its non-anchor items</u>	<u>Means and Standard Deviations¹</u>		<u>t(91)</u>	<u>p</u>
	<u>Excellent</u>	<u>Anchor</u> <u>Poor</u>		
A. Computer Bundle				
Printer	4.00 (.89)	3.94 (1.0)	0.31	.76
Printer Stand	3.42 (.86)	3.99 (.90)	-3.13	.00
<hr/>				
B. Bedroom Bundle				
Chest	3.19 (.78)	3.27 (.84)	-0.47	.64
Night Stand	3.62 (.89)	3.81 (.85)	-1.05	.30
<hr/>				

¹Standard deviations are shown in parentheses.

mediocre, average, and in-between good and bad. Hence these small-to-medium effect sizes suggest that this potentially interesting hypothesis should be explored further in future research efforts.¹¹

Summary of Results

This section tested hypotheses based on the central idea that the process buyers use to evaluate a bundle of items exhibits characteristics of an anchoring and adjustment process. Hypotheses pertaining to three broad issues were tested: 1) order of information acquisition (H1, H2), 2) integration of information during the evaluation of bundle offers (H3), and 3) influence of the anchor item on the evaluation of other items in a bundle (H4, H5a, H5b).

Tests of H1 and H2 found support for the argument that, during the evaluation of a bundle of items, items perceived to be more important are examined prior to the less important items. Hypothesis 3, that the net effect of information integration should be averaging, was tested (and supported) using several different analytical approaches.

First, it was shown that, depending upon the evaluation of the anchor item, the overall evaluation of a bundle could either be pulled up or down as more items were added to the bundle. Specifically, evaluations of the

¹¹ The hypothesis is interesting from a marketing application point of view. Firms are always attempting to bundle add-ons items with a "main" item. The question whether the perceived quality of the "main" item influences the perceptions of the other items is therefore an important one.

bundle improved when moderate-quality items were added to an excellent anchor, while evaluations deteriorated when the the anchor item was perceived to be of poor quality. Both aggregate and individual-level analyses were conducted and were found consistent with the anchoring and adjustment hypothesis.

Second, the data were analyzed using the analysis of variance approach. The hypothesized interaction between the two experimental factors (bundle context and anchor context) was supported. Results of the analysis of simple effects, using contrasts and Duncan's multiple range tests, were consistent with the analysis of variance results.

Hypotheses H4, H5a and H5b had argued that, because the anchor item served as a reference, the resultant assimilation-contrast effects could cause the anchor item's evaluation to influence the evaluation of other bundle items. This hypothesis was tested using the four non-anchor items and was supported only for one item, though evaluation of two other items was directionally correct. Analysis of effect sizes found them to range from small to medium.

CHAPTER SUMMARY

This chapter presented the results of experiment 1 whose purpose was to test hypotheses based on the central idea that buyers use an anchoring and adjustment process to form an overall evaluation of items in a bundle. First, procedural details such as the cover story, stimulus material used, and sequence of tasks in the experiment were presented. The discussion

of results began with the presentation of some preliminary analyses pertaining to the reliability of measures and effectiveness of the manipulations. Results showed that reliability of the measures was satisfactory and manipulations (of items' perceived quality and relative salience) had worked as intended. Support was found for the hypotheses central to the anchoring and adjustment argument (H1, H2, H3). Analyses based on different approaches (analysis of variance and regression) yielded similar results. However, evidence supporting the argument that the anchor evaluation influences evaluations of other items in a bundle (H4, H5a, H5b) was very weak. However, it was pointed out that these weak results may be a consequence of the type of descriptions that were employed in this investigation.

CHAPTER V

METHODOLOGY AND PRETESTING (EXPERIMENT 2)

OVERVIEW

The focus of the previous two chapters was on the process used by consumers to evaluate bundle offers. Although the importance of price information in the evaluation of bundle offers was recognized in the conceptual development presented in Chapter II, experiment 1 purposely did not include price in the empirical investigation. This strategy provided an opportunity to test the hypothesized anchoring adjustment process without the complex influences of price cues. This chapter presents the design and methodological issues related to the second empirical investigation conducted in this research. In experiment 2, an attempt was made to investigate the role of price information in the formation of perceptions of overall savings in bundle offers (i.e., total transaction value).

The chapter is organized in two major sections. The first section highlights the major conceptual ideas that were examined empirically in experiment 2. In this section, the proposed model of bundle's transaction value is reviewed and hypotheses tested in this research are stated. The second major section of this chapter then presents methodological details

and results of two pretests. The sections on pretests pertain to the objectives of pretesting and the insights that were obtained at each pretest.

CONCEPTUALIZATION: A RECAPITULATION

The complex role of price information in the evaluation of products was documented earlier in Chapter II. Because bundle offers typically involve the transaction of several products, the complexity of the price information can be substantial (compared to single-product transactions). In Chapter II, the role of price in the evaluation of bundle offers was developed in two related models: 1) the formation of acquisition value (Figure 11) and 2) the formation of transaction value (Figure 12). Whereas experiment 1 empirically tested a part of the model focusing on the formation of acquisition value, experiment 2 investigated the model pertaining to transaction value. In this section the constructs are defined, the model of transaction value is briefly reviewed, and the hypotheses to be tested in this investigation are developed.

Definitions of the Constructs

The relative complexity of the price information can vary from one bundling situation to another. Because sellers usually strive to increase the sales of both the individual items and bundles, they attempt to provide financial incentives to encourage both types of transactions. These

financial incentives may typically be created by providing the following price information to buyers: 1) regular prices of the individual items, 2) sale prices of the individual items, and 3) the sale price of the bundle. By making the sale prices of the items less than the regular prices, and making the price of the bundle less than the sum of the sale prices of the individual items, sellers attempt to create two types of financial incentives: 1) to buy the individual items, and 2) to buy the bundle. The first three constructs defined below pertain to perceptions of the different pieces of price information in a bundle offer.

1. Items' Reference Sacrifice: The perception of monetary loss associated with the total amount required to purchase all the bundle items separately at their regular prices.
2. Items' Actual Sacrifice: The perception of monetary loss associated with the total amount required to purchase all the bundle items separately at their sale prices.
3. Bundle's Sacrifice: The perception of monetary loss associated with the amount required to purchase the bundle.

Three additional constructs are now defined which relate to the perceptions of savings.

4. Items' Transaction Value: The perception of savings associated with the amount required to purchase all the bundle items separately in the offer.
5. Bundling Transaction Value: The perception of savings associated with bundle items as a set versus purchasing the bundle items separately.
6. Total Transaction Value: The perception of savings associated with purchasing the bundle of items as a set.

The Proposed Conceptual Model

The conceptual model which was empirically investigated in this experiment is shown in Figure 12. The model, as described earlier in Chapter II, is based on the premise that buyers' perception of savings in a bundle offer (total transaction value) is influenced by perceptions of two other savings: 1) perception of savings on the items (items' transaction value) and 2) perception of additional savings on the bundle (bundling transaction value). The constructs items' transaction value and bundling transaction value are themselves influenced by different perceptions of perceived sacrifice: items' reference sacrifice, items' actual sacrifice, and bundle's sacrifice. The justification for these hypothesized influences was presented earlier in Chapter II.

Hypotheses

Based on the arguments presented earlier in Chapter II, the following hypotheses were the focus of the empirical investigation in experiment 2. The first two hypotheses pertain to the influence of items' transaction value and bundling transaction value on the total transaction value.

- H1: Buyers' overall perception of saving in a bundle offer will be positively influenced by 1) perceived savings on the individual items, and 2) the perceived additional savings offered on the bundle.
- H2: The influence of perceived additional savings on the overall perception of savings in a bundle offer will be greater than that of perceived savings on the individual items.

The next six hypotheses pertain to the sign of the hypothesized relationships shown in the conceptual model discussed above (see Figure 12).

In each of these hypotheses, the condition of *ceteris paribus* (implying everything else being constant) is assumed.

- H3: Items' reference sacrifice will be positively related to items' transaction value.
- H4: Items' actual sacrifice will be negatively related to items' transaction value.
- H5: Items' actual sacrifice will be positively related to bundling transaction value.
- H6: Bundle's sacrifice will be negatively related to bundling transaction value.
- H7: Items' transaction value will be positively related to total transaction value.
- H8: Bundling transaction value will be positively related to total transaction value.

In addition to the hypotheses stated above, three alternative hypotheses will also be tested in the empirical investigation. Each of these hypotheses proposes an evaluation process that differs from hypothesis 1. Hence they are referred to as H1a, H1b, and H1c.

- H1a: In H1, only perceived additional savings offered on the bundle have an effect on buyers' perception of overall savings; perceived savings on the individual items have no effect.
- H1b: In H1, only perceived savings on the individual items have an effect on buyers' perception of overall savings; perceived additional savings on the bundle have no effect.
- H1c: In H1, neither perceived savings on the items nor additional savings on the bundle have an effect on buyers' perception of overall savings; instead, perception of savings in a bundle offer are framed as a comparison of the bundle price and the sum of the individual items' regular prices.

Note that these alternative hypotheses negate one or more of the hypotheses H3-H8 stated earlier. Specifically, H1a negates H7, H1b negates H8, and H1c negates both H7 and H8.

Section Summary

This section briefly reviewed the conceptual arguments presented earlier in Chapter II. The conceptual model of a bundle's transaction value was described and its six constructs were defined. The conceptual model is based on the premise that buyers' perceptions of savings in a bundle offer are positively influenced by 1) perception of savings offered on the items, and 2) perception of additional savings offered on the bundle. These perceptions of savings, in turn, are influenced by perceptions of different pieces of price information available to buyers in the bundle offer. In addition to eight hypotheses based on the conceptual model, three alternative hypotheses were also presented.

EXPERIMENT 2: METHODOLOGY AND PRETESTING

Having briefly reviewed the conceptual arguments above, this section provides details of experiment 2. First, the rationale behind the experimental design is presented and the design itself is described. Results of two pretests and their impact on the operational details of this experiment are then discussed.

Methodological Objectives and Strategy

At the heart of the conceptualization reviewed above is the idea that perceptions of savings in a bundle offer are positively influenced by two

other perceptions: 1) perception of savings offered on the items (items' transaction value) and 2) perception of additional savings offered on the bundle (bundling transaction value). The conceptual model also hypothesized the antecedents of these two perceptions. It was also hypothesized that the influence of additional savings offered on the bundle would be greater than that of savings offered on the items.

Given the central importance of these two perceptions in the theoretical account, it was decided to choose an experimental design which provided an opportunity to 1) manipulate the relative magnitude of the two perceptions of savings, 2) observe their individual and combined influence on the overall perceptions of savings, and 3) test the proposed and alternative hypotheses. These criteria suggested a between-subject design in which the two perceptions of interest (items's transaction value and bundling transaction value) were manipulated as the independent variables. The design used for this empirical investigation is now described.

Experimental Design

The 3 (savings on the items) X 3 (additional savings on the bundle) between-subjects design used in this experiment is shown in Figure 22. Each factor of the design was manipulated over the following three levels: \$0, \$20, and \$40. These levels were chosen on the basis of pretests described later in this chapter. This design provided an opportunity to hold any one financial incentive constant (say, savings on the items) while the other financial incentive was changed.

Additional Savings Offered
on the Bundle

		\$0	\$20	\$40
Savings Offered \$20 on the Items	\$0	1	2	3
	\$20	4	5	6
	\$40	7	8	9

FIGURE 22. EXPERIMENTAL DESIGN 2: EFFECT OF ALTERNATIVE PRICE FORMATS ON BUNDLE'S TRANSACTION VALUE

For example, a situation of this type is illustrated by the cells 1, 2, and 3 of the design (see Figure 22). Hence, each horizontal row of the design (cells: 1, 2, 3; 4, 5, 6; 7, 8, 9) maintains the factor "savings on the items" at a constant level and increases the magnitude of the other factor (namely, additional savings on the bundle). In contrast, each vertical column maintains the "additional savings on the bundle" constant and increases the "savings on the items." Finally, it can be observed that the diagonal cells (2, 4; 3, 5, 7; 6,8) present situations where bundle prices are equal.

To further illustrate the nature of manipulations implied by this experimental design, examine Figure 23 where the actual price values implied in different cells of the design are shown. In Figure 23, the regular and sale prices of the items A and B are shown along with the price at which the bundle (shown as (A+B) in the figure) can be purchased. In cells 1, 2, and 3 of the design, the financial incentive to purchase the items separately remains constant. However, the additional savings offered on the bundle increases from \$0 to \$40. The situation implied in cells 1, 4, and 7 is different. There, the additional incentive to purchase the bundle is maintained at \$0, but the incentive to purchase the individual items is increased from \$0 to \$40. An examination of other cells in Figure 23 may further clarify the nature of the experimental design.

Using the \$0 level in each factor implies no financial incentive for that factor. In cell 3 of the design (see Figure 23), the implied financial incentive to purchase the items A or B individually is zero. Simi-

Additional Savings Offered
on the Bundle

		\$0	\$20	\$40																																																														
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FIGURE 23. PRICE STIMULI USED IN DIFFERENT CELLS OF THE EXPERIMENTAL DESIGN

larly, the implied financial incentive to purchase the bundle in cell 7 is \$0, though there is an incentive to purchase the items individually. These manipulations provide a basis for presenting bundle offers in alternative ways, and to compare the relative impact (on perceptions of savings) of each approach.

Results of the Pretests

In the previous section, a 3(savings offered on the items) X 3(additional savings offered on the bundle) between-subjects design was described. As argued earlier, this design was considered appropriate because it permitted an empirical examination of the independent and joint effects of the two (theoretically important) factors of the design. Before the final run of the experiment, however, several issues had to be resolved during pretests. In this section the objectives that guided the pretesting are discussed, followed by results of the two pretests.

Objectives of Pretesting

Recall that the proposed experimental design required the manipulation of price information of individual items and the bundle. The first objective of the pretesting, therefore, was to select items that would be appropriate for this investigation. Because the design required manipulation of price information, a second objective of the pretesting was to identify prices of the selected items that would be suitable for the

experimental scenarios. The two pretests discussed below were guided by these objectives.

Pretest 5

Selection of Items. To keep the experimental scenarios relatively simple, it was decided that the bundle to be used in this research should not have more than two products. Given the nature of this experiment, the following criteria were used to select the products: 1) subjects should be reasonably familiar with and knowledgeable about them, 2) subjects' estimate of the products' average retail prices should not have excessive variability, and 3) products should be such that it is considered reasonable to buy them together as a bundle. Recall that, in experiment 1, an attempt was made to select bundles in which there was a clearly defined anchor item. However, in this experiment, the potential complexities (if any) that could be caused by bundle items of varying importance could not be explicitly anticipated. Hence, a fourth criteria used to select products was that the two items in the bundle should be considered equally important by the subjects.

The pretesting done for experiment 1 (pretests 1-3) suggested products that satisfied the four product-selection criteria stated above. Recall that relative importance was measured in the first experiment by 1) asking subjects to distribute 100 points between the items of the bundle, and 2) by obtaining estimates of average retail prices of the items. The three luggage items used in pretest 5 of the first experiment

provided the following data: relative importance--carry-on (37.15), pullman (35.06), tote (28.07); average retail prices--carry-on (\$65.14), pullman (\$97.87), tote (\$55.22). Perceived knowledge and perceived relevance of these items were also adequate (20.7 and 16.9 respectively; see Table 1).

Selection of Prices. The data reported above suggested that luggage items would be appropriate for this experiment. However, the issue of suitable prices for these items had yet to be resolved. To address the issue of prices, a pretest was conducted in which 22 subjects were shown descriptions of 1) a garment bag and 2) a pullman. The descriptions used are presented in Appendix E. Based on these descriptions, subjects provided estimates of prices they would consider low, reasonable, and high (see Appendix E).

The results are reported in Table 27. Pretests conducted for experiment 1 had suggested that the relative expensiveness of these items was perceived to be similar by the subjects. As shown in Table 27, price estimates of the two items again were quite similar, though characterized by large standard deviations.

Decisions Based on the Pretest. Based on the data available from the pretests of experiment 1, it was decided that two luggage items (garment bag and a pullman) would be appropriate products for this investigation. The pretest reported above suggested that prices (as stimuli) of the luggage items should preferably not fall outside the \$70 to \$125 range. To avoid potential complications (if any) that could be caused by pricing

TABLE 27
PRETEST 5: PRICE ESTIMATES

Bundle Item	Means and SDs of Prices ¹ (\$)					
	Low		High		Reasonable	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
Garment Bag	36.5	22.7	107.3	72.1	70.5	42.4
Pullman	42.3	32.3	128.1	112.9	77.7	58.6

¹Based on N = 22

the two items differently, it was decided to use \$99 as a suitable (regular) price for each item.

Pretest 6

Development of Instrument and Manipulations. The purpose of this pretest was to 1) examine the adequacy of price manipulations and 2) assess the reliability of the constructs' items. Price stimuli were developed for all cells of the experimental design. These stimuli are shown in Appendix J (cell #s are referred to as survey #s), while the instruments are in Appendices F and G. The method of presenting the price information was selected to ensure that buyers perceived the savings correctly and without having to perform a lot of additions and/or subtractions. effort necessary to figure out the implied savings. Questionnaires were also developed in which the theoretical constructs were operationalized using multiple items (see Appendices F and G for details of the questionnaires).

The pretest was conducted in the diagonal cells 3, 5, and 7 of the experimental design (see Figures 22 and 23) because they provided an opportunity to test the effectiveness of a wide range of manipulations. As shown in the figures, manipulation of savings in these cells was as follows:

CELL	SAVINGS ON ITEMS	ADDITIONAL SAVINGS ON BUNDLE
3	\$0	\$40
5	\$20	\$20
7	\$40	\$0

Results. First, reliability of the constructs was assessed by examining the Cronbach's alpha and the inter-item correlations for each construct. The results are reported in Table 28. As can be noted from this table, reliability of all the constructs was satisfactory and the mean inter-item correlations were also quite reasonable. However, the relatively low mean inter-item correlation of the construct bundle's sacrifice suggested the possibility of some problematic items. An examination of the inter-item correlations also revealed some low values. Based on these observations, some minor changes in the wording of the items were made with the objective to improve comprehension and reduce ambiguity.

In addition to assessing the reliability of the constructs, analyses were also conducted to examine the effectiveness of the manipulations. Table 29 presents the results of these analyses. To assess the effectiveness of the manipulations, mean values of the variables bundling transaction value (perceived additional savings on the bundle) and items' transaction value (perceived savings on the items) were examined.

Because savings offered on the items were the lowest (\$0) in cell 3, low mean values of the variable items' transaction value were expected in that cell. As savings offered on the items were the highest (\$40) in cell 7, high values of the variable were anticipated. The mean value in cell 5 should have been between that of cells 3 and 7. As can be observed in the table, the general pattern of results was consistent with the manipulations.

The corresponding arguments for the variable bundling transaction value (additional savings offered on the bundle) suggested that the mean

TABLE 28
PRETEST 6: RELIABILITY OF MEASURES

<u>Variable</u>	<u>Alpha</u>	<u>Mean inter-item Correlation</u>
Total Transaction Value	0.88	0.65
Bundling Transaction Value	0.90	0.70
Items' Transaction Value	0.87	0.63
Bundle's Sacrifice	0.81	0.61
Items' Actual Sacrifice	0.87	0.70
Items' Reference Sacrifice ¹	0.94	0.79

NOTE: Results based on N = 42, except where stated.

¹This variable was relevant only in cells 5 and 7 for this test. Hence, results for it are based on N = 28.

TABLE 29
PRETEST 6: EFFECT OF MANIPULATIONS ON PERCEPTIONS

<u>Variable</u>	<u>CELL 3</u>		<u>CELL 5</u>		<u>CELL 7</u>	
	<u>\bar{X}</u>	<u>SD</u>	<u>\bar{X}</u>	<u>SD</u>	<u>\bar{X}</u>	<u>SD</u>
Total Transaction Value	4.37	1.35	4.68	1.25	3.60	1.54
Bundling Transaction Value	4.75	1.33	4.71	0.96	2.18	1.41
Items' Transaction Value	2.61	0.98	3.38	1.29	4.55	1.08
Bundle's Sacrifice	4.02	1.07	4.42	1.08	3.93	1.03
Items' Actual Sacrifice ¹	----	----	5.88	1.04	5.27	1.54
Items' Reference Sacrifice	5.00	1.16	4.91	0.95	4.20	1.55

Note: Savings offered in cells 3, 5, and 7 were as follows:

<u>Cell #</u>	<u>Savings on Items</u>	<u>Additional Savings on Bundle</u>
3	\$ 0	\$40
5	20	20
7	40	0

¹This variable is not relevant in cell 3 and was not measured

value should be lowest in cell 7, in-between in cell 5, and highest in cell 3. Mean values were as anticipated (see Table 29), suggesting that the manipulations were working as intended. An examination of the mean values of the other constructs also did not suggest any problems.

Decisions Based on the Pretest. Satisfactory reliability and mean inter-item correlations of the constructs suggested that the operationalizations were of acceptable quality. However, it was felt that many items pertaining to the same construct were placed too close to each other in the questionnaire. Hence, some reorganization of the items' placement in the questionnaire was done. A few changes were made in the wording of the items for the construct bundle's sacrifice to ensure better comprehension. Additionally, it was discovered that some items in Section II of the questionnaires had been erroneously repeated. The repeated items were removed.

Examination of the mean values of items' transaction value and bundling transaction value indicated that the price stimuli successfully created the intended manipulations. As a result, no changes in the presentation of price information were made.

Summary of Pretests

The objectives of the pretesting stage were to 1) select appropriate items for the investigation, 2) develop reliable multiple measures for the constructs, and 3) assess the effectiveness of the manipulations. Based on the first pretest, two luggage items (garment bag and pullman)

were selected and it was decided to set the (regular) price of each item at \$99. The second pretest developed and tested the effectiveness of the price stimuli in cells 3, 5, and 7 of the experimental design. Questionnaires to be used in these cells were also developed. Reliability of the constructs was found to be satisfactory and the manipulations worked as intended.

Operationalization of Dependent Measures

Decisions about the operational details were made in pretest 6 discussed above. Details of the operationalizations used in the actual experiment are presented in this section. The conceptual model discussed above hypothesizes relationships between six constructs that fall into two broad categories: perception of savings (items' transaction value, bundling transaction value, and total transaction value), and perception of sacrifice (items' reference sacrifice, items' actual sacrifice, and bundle's sacrifice). Each of these six constructs was operationalized in this research using multiple items and the guidelines suggested by Churchill (1979).

The items pertaining to each of these constructs are shown in Figure 24. A 7-point rating scale was employed to obtain responses to each of these items. Certain words or phrases were highlighted in the items to direct attention toward them so that better comprehension of the items could be achieved. Given the similar nature of several constructs in this research, it was considered important that each item be understood prop-

A. Total Transaction Value

1. Overall, if I bought both A and B **as a set**, I will be saving a lot of money
2. Overall, if I bought both A and B **as a set**, the deal I would be getting is
3. Overall, buying both A and B **as a set**, appears to be a good bargain
4. Overall, if I bought both A and B **as a set**, I would be taking advantage of an attractive price reduction

B. Items' Transaction Value

1. Even if I bought both A and B **separately** at their **sale prices**, I would still be saving a lot of money
2. Even if I bought both A and B **separately** at their **sale prices**, I would still be getting a good bargain
3. Even if I bought both A and B **separately** at their **sale prices**, I would still be taking advantage of an attractive price reduction
4. Even if I bought both A and B **separately** at their **sale prices**, the deal I would be getting will be

C. Bundling Transaction Value

1. Compared to the cost of buying both A and B **separately** at their **sale prices**, the additional savings I can get by buying both A and B **as a set**, are
2. Compared to the cost of buying both A and B **separately** at their **sales prices**, buying both A and B **as a set**, costs much less
3. Compared to the cost of buying both A and B **separately** at their **sale prices**, buying both A and B **as a set** saves me a lot of money.
4. Compared to the cost of buying both A and B **separately** at their **sale prices**, buying both A and **as a set** offers very attractive savings.

....continued

FIGURE 24. OPERATIONALIZATION OF DEPENDENT MEASURES

D. Items' Reference Sacrifice

1. At their **regular prices**, buying both A and B **separately** makes the total monetary sacrifice I would be making
2. At their **regular prices**, the total amount required to buy both A and B **separately** appears expensive to me
3. At their **regular prices**, the total amount required to buy both A and B **separately** is

E. Items' Actual Sacrifice

1. At their **sale prices**, the total amount required to buy both A and B **separately** appears expensive to me
2. At their **sale prices**, the total amount required to buy both A and B **separately** is
3. At their **sale prices**, buying both A and B **separately** makes the total monetary sacrifice I would be making

F. Bundle's Sacrifice

1. The amount required to purchase both A and is **as a set** appears expensive to me
2. The amount of money required to buy both A and is **as a set** is
3. At the **offer price**, buying both A and **as a set** makes the monetary sacrifice I would be making

FIGURE 24 (continued). OPERATIONALIZATION OF DEPENDENT MEASURES

erly by the subjects. Appendices H and I contain a copy of the instrument used in this investigation.

Perdue and Summers (1986) suggest that the dependent measures should always be collected before the manipulation checks (if they are to be obtained in the main experiment itself). Note that, in this investigation, two of the constructs (items' transaction value and bundling transaction value) can be thought of as dependent measures and also as manipulation checks. Hence, as shown in section II of Appendix I, the first set of questions pertained specifically to the bundle offer itself. As suggested by Perdue and Summers (1986), the items for the manipulation checks came later to ensure that they did not contaminate the dependent measures pertaining to the bundle offer.¹²

CHAPTER SUMMARY

Whereas experiment 1 tested the anchoring and adjustment hypothesis, the second experiment described in this chapter focused on the model of bundle's transaction value. The proposed conceptualization was briefly reviewed where it was noted that two constructs of central importance in the conceptual model are: 1) perception of savings offered on the items (items' transaction value) and 2) the additional savings offered on the

¹² In cells 1, 2, and 3 of the experimental design, only regular prices of the items were provided. Hence, the construct items' actual sacrifice (perception of monetary sacrifice associated the items' sale prices) was not operationalized in these cells. The instrument employed in cells 4-9 is in Appendix I. Appendix H contains the instrument employed in cells 1-3 of the design.

bundle (bundling transaction value). A 3(savings offered of the items) X 3(additional savings offered on the bundle) between-subjects design was then described. This design provides an opportunity to examine and test the separate and joint influences of these two constructs on the overall perception of savings in a bundle offer. Based on the results of pretests, two luggage items (garment bag and pullman) were used as stimuli in this investigation and the experimental task was presented to subjects as an advertisement featuring these items.

CHAPTER VI

DATA ANALYSIS AND RESULTS OF EXPERIMENT 2

OVERVIEW

The purpose of this chapter is to present the results of experiment 2. First, procedural details of the experiment are presented which focus on issues such as the cover story, stimulus material, sequence of tasks in the experiment, and characteristics of the subjects. Second, results of the experiment 2 are discussed. Results begin with the presentation of some preliminary analyses that focused on issues such as reliability of the constructs and manipulation checks. This discussion is followed by a detailed account of how the proposed hypotheses were tested. Regarding hypotheses testing, two sets of analyses are described. The first set of analyses were based on the results of analysis of variance and multiple comparisons, whereas the second set of analyses employed the LISREL causal modeling approach.

As a preview of the discussion presented in this chapter, it may be noted that, in general, the hypothesized model and its relationships were supported by this empirical investigation. Both the ANOVA approach and the LISREL causal modeling approach yielded insights that were consistent with the proposed hypotheses. Based on these convergent pieces of evi-

dence, this chapter concludes with the argument that the conceptualization tested in this research appears promising and should be further elaborated in future investigations.

PROCEDURAL DETAILS

This section provides details about the cover story used in this research, the stimulus material in different cells of the experimental design, sequence of tasks completed by subjects during the experiment, and characteristics of the subjects.

Cover Story

Savings on the items and additional savings on the bundle are the two factors of the between-subject design employed in experiment 2. These factors were manipulated by providing alternative price scenarios to subjects in different cells of the experimental design. Given the nature of these manipulations, the experimental task was presented under the guise of an advertisement. Hence, on the cover sheet of the response booklet, subjects were instructed that "as part of a market research study, we are interested in the reactions of consumers such as yourself regarding an advertisement" They were further told that they would be shown an advertisement and then asked some questions "based on your reading of the advertisement." Feedback obtained during the debriefing sessions indicated that the cover story was considered plausible by the

subjects. At the conclusion of the debriefing sessions, subjects were informed about the theoretical issues that were being investigated in this research.

Stimulus Material

To keep the experimental scenarios relatively simple, it was decided that the bundle used in this research should not have more than two products. Given the nature of this experiment, the following criteria were used to select the products: 1) subjects should be reasonably familiar with and knowledgeable about them, 2) subjects' estimate of the products' average retail prices should not have excessive variability, and 3) products should be such that it is considered reasonable by subjects to buy them together as a bundle. These criteria were used during pretests to select the following two luggage items: garment bag and a pullman. Appendix J contains the stimulus material used in cells 1-9 of the experimental design (cell #'s are referred to as survey #'s).

Sequence of Tasks in the Experiment

Response booklets used in this experiment are shown in Appendices H and I. On the cover sheet of these booklets, subjects were given information about the study and other study-related instructions. The remaining part of the response booklets were divided into four sections.

In Section I, subjects were asked to respond to six statements about "how you shop and the feelings you have about shopping." This section served primarily as a warm-up exercise so that 1) subjects could get into the right frame of mind (by thinking about shopping), and 2) they could practice responding to the rating scales.¹³

Instructions provided in Section II asked subjects to assume that they were "interested in purchasing the following two luggage items: 1) a garment bag and 2) a pullman." They were also instructed to assume that they wished to "have matching luggage items and would therefore prefer to purchase these two luggage items together as a set."¹⁴

The subjects were then informed to read the advertisement shown on the next page of their response booklets. To avoid potential problems associated with some subjects focusing on the execution of the advertisement, it was stated in the instructions that "we are interested in your reactions to the information contained in the advertisement, not on how well the advertisement is presented." The advertisement, was inserted (and not stapled) in the response booklet to ensure that subjects could

¹³ However, it is possible that warm-up questions focusing on price may have overly sensitized subjects to monetary savings presented in the bundle offer.

¹⁴ There was a concern that purchase plans buyers have prior to examining a bundle offer may influence their perceptions of the savings offered in the bundle offer. For example, it is possible that buyers wishing to purchase only one item may frame savings in the bundle offer differently than those who wish to purchase the whole set. To avoid the potential complications, if any, caused by such differences, all subjects were instructed to have similar plans of purchasing the "two luggage items together as a set". This issue is discussed later in the section on future research directions in Chapter VII.

easily remove it from the response booklet and refer to it when needed while responding to the statements on the dependent measures. After the advertisement had been examined, measures of dependent variables were obtained.

The third section of the response booklets asked subjects to indicate prices based directly on the advertisement. The purpose of these questions was to ensure that the price information shown in the advertisement was properly comprehended by the subjects. The response booklets concluded with section IV in which questions were asked about: 1) participation in a similar study, 2) ownership of a garment bag and a pullman, 3) perceived knowledge about the luggage items shown in the advertisement, 4) purpose of the study, and 5) demographic details of the subjects.

Subjects

Three hundred and three undergraduate students enrolled in business courses in the College of Business at Virginia Tech, Blacksburg, VA, participated in this experiment. After each data collection session, a drawing was held for tickets to the movies. In addition, some subjects were given extra credit for participating in the experiment. To obtain a balanced design with equal cell sizes, response booklets were examined after each data collection session to identify incomplete responses that would warrant the removal of a subject. Because some subjects were present in more than one data collection session, duplicate responses were identified and removed after each session. Thirty three subjects were removed

following this procedure. If a response booklet (for a certain cell of the experimental design) was removed from the usable responses, it was replaced in the next data collection session to keep the design balanced.

After the data collection for this experiment had been completed, responses of several subjects had to be removed for a variety of reasons. In section IV of the response booklet, subjects were asked to indicate what they thought was the purpose of the study. Answers to this question were used to screen out several subjects.

Ten subjects were removed because they used words such as bundling, bundle, or bundling price in their responses. These subjects were regarded as potentially problematic because, obviously, they were quite familiar with the substantive context of this research. It is quite possible that this familiarity did, in fact, have no contaminating influence. However, to be conservative, these subjects were removed from the analysis.

Three subjects indicated in their responses that they were thoroughly confused by statements in the response booklet and were considered inappropriate for inclusion in the data analysis. Two subjects were removed from analysis because they felt that the purpose of the study was to see how "stupid" or "dumb" they were. And, finally, three subjects were randomly removed from analysis to balance the cells. Hence, overall, 51 subjects were removed from analysis. These deletions provided a balanced design with 28 subjects per cell and a total sample size of 252.

Following the procedures discussed earlier in the context of experiment 1, power analysis was conducted. Assuming medium effect size, power for the various effects was:

Savings offered on the items = 0.88
Additional savings offered on the bundle = 0.88
Interaction = 0.80

PRELIMINARY ANALYSES

Results of experiment 2 are presented in two sections: 1) preliminary analyses, and 2) hypotheses testing. Preliminary analyses focused on the assessment of measure reliability and manipulation checks. The discussion on hypotheses testing is organized first around results of the analysis of variance and multiple comparisons. Subsequently, tests of the proposed model of bundle's transaction value are based on insights obtained from the causal modeling approach.

Reliability

Reliability of the measures was assessed by computing Cronbach's alpha for each construct. In addition, internal consistency was further assessed by examining the pattern of inter-item correlations. Table 30 reports the alpha values and the mean inter-item correlations of the dependent measures used in this experiment. Consistent with pretest 2, the operationalizations were satisfactory (Table 30). Although the alpha values and mean inter-item correlations tended to be relatively lower for the constructs pertaining to perceived sacrifice, overall the results were above the minimum value of .70 suggested by Nunnally (1978).

TABLE 30
RELIABILITY OF THE CONSTRUCTS

<u>Variable</u>	<u>Alpha</u>	Mean inter-item <u>Correlation</u>
Total Transaction Value	0.94	0.80
Bundling Transaction Value	0.95	0.82
Items' Transaction Value	0.84	0.56
Bundle's Sacrifice	0.76	0.52
Items' Actual Sacrifice	0.74	0.50
Items' Reference Sacrifice	0.79	0.58

Manipulation Checks

The guidelines suggested by Perdue and Summers (1986) were followed in this investigation. They suggest that, first, multiple items should be developed to measure each manipulation. After assessing the reliability of these manipulation check variables, they should be employed as dependent measures in an analysis of variance. Results of these analyses of variance are now reported.

Perceived Savings on the Items

The following two experimental factors were manipulated in this investigation: 1) perceived savings on the items and 2) perceived additional savings on the bundle. The constructs items' transaction value and bundling transaction value measured, respectively, these two manipulated factors. Hence these constructs, though part of the proposed conceptual model, also served as manipulation checks. This section (and the following one) describe the results of analyses conducted to assess the effectiveness of manipulations.

Two sets of analyses of variance were conducted; the first with items' transaction value (measure of perceived savings offered on the items) as the dependent variable and the second with bundling transaction value (measure of perceived additional savings on the bundle). The effect size ω^2 of the main and interaction effects were then examined to assess the effectiveness of the manipulations.

Table 31 presents the results of the first analysis of variance with items' transaction value as the dependent variable. In panel A, results of the analysis of variance indicated that, as expected, savings on items accounted for a larger portion of the total sums of squares (compared to that accounted for by additional savings on the bundle). The effect size ω^2 for this factor (0.258) was larger than the other two effects (main effect: .003; interaction: .027). These results suggest that the perception of savings on the items was successfully manipulated and the other perception (of additional savings on the bundle) was left largely unaffected.

Panel B of Table 31 reports the mean scores obtained in different cells of the design. As expected, perception of savings increased significantly ($p < .05$) from 2.83 to 4.38 as the savings offered on the items increased from \$0 (in cells 1, 2, 3) to \$40 in cells (7, 8, 9).

Perceived Additional Savings on the Bundle

Following the procedure described above, an analysis of variance was also conducted with bundling transaction value (measure of perceived additional savings on the bundle) as the dependent measure. As shown in are shown in Table 32, effect size of the factor additional savings on bundle (0.623) was larger than that of the other main effect (0.036) and the interaction (0.007). Mean scores shown in panel B of the table indicate that perceptions of additional savings on the bundle were successfully manipulated--increased additional savings lead to significantly different

TABLE 31
MANIPULATION CHECKS FOR ITEMS'
TRANSACTION VALUE

A. ANOVA Results with Items' Transaction Value as Dependent Variable

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>ω^2</u>	<u>p</u>
Savings on Items	103.06	2	51.53	44.61	0.258	0.000
Additional Savings on Bundle	1.15	2	0.57	0.50	0.003	0.609
Interaction	15.23	4	3.81	3.30	0.027	0.012
Error	279.54	242	1.16			
Total	398.98	250				

B. Mean Scores of Items' Transaction Value

<u>Savings Offered</u> <u>on Items</u>	<u>Mean and SD</u>	
	<u>\bar{X}</u>	<u>SD</u>
\$0 (cells: 1, 2, 3)	2.83	1.07
\$20 (cells: 4, 5, 6)	3.85	1.05
\$40 (cells: 7, 8, 9)	4.38	1.16

All means were significantly different ($p < .05$) using Duncan's Multiple Range Test

TABLE 32
MANIPULATION CHECKS FOR BUNDLING
TRANSACTION VALUE

A. ANOVA Results with Bundle's Transaction Value as Dependent Variable

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>ω^2</u>	<u>p</u>
Savings on Items	33.35	2	16.68	14.81	0.036	0.000
Additional Savings on Bundle	534.05	2	267.02	237.08	0.623	0.000
Interaction	11.07	4	2.77	2.46	0.007	0.046
Error	273.69	243				

B. Mean Scores of Bundling Transaction Value

<u>Additional Savings Offered on the Bundle</u>	<u>Mean and SD</u>	
	<u>\bar{X}</u>	<u>SD</u>
\$0 (cells: 1, 4, 7)	1.99	1.32
\$20 (cells: 2, 5, 8)	4.58	1.12
\$40 (cells: 3, 6, 9)	5.40	0.91

All means were significantly different ($p < .05$) using Duncan's Multiple Range Test

($p < .05$) perceptions of additional savings (1.99 in cells 1, 2, 3 to 5.40 in cells 3, 6, 9).

Randomization Checks and Pontential Confounds

Randomization checks were conducted for the following potentially confounding variables: sex (male/female), major (marketing/non-marketing), class standing (junior/senior), and ownership of bundle items (yes/no). These categorical variables were crossed with each factor of the experimental design and χ^2 s were computed for each variable; significant χ^2 s would imply a relationship between the experimental factors and the potentially confounding variables (i.e., a lack of randomization). However, all χ^2 s were non-significant ($p > .20$), suggesting that the potentially confounding variables were not systematically related with the experimental factors (see Table 33).

Summary of Preliminary Analyses

This section described the preliminary analyses that were conducted. Specifically, the reliability and inter-item correlations of the constructs were examined and were found to be satisfactory. Following the method suggested by Perdue and Summers (1986), measures of the two manipulated factors were employed as dependent variables in two separate analyses of variance. Examination of the effect sizes in these analyses of variance indicated that manipulations had worked as intended. Based

TABLE 33
CHECKING POTENTIAL CONFOUNDING EFFECTS

<u>Variable</u>	<u>Savings on Items</u>	p-values ¹ <u>Additional Savings on Bundle</u>
Sex	0.88	0.44
Class Standing	0.40	0.52
Major	0.15	0.53
Ownership of Garment Bag	0.58	0.20
Ownership of Pullman	0.95	0.22

¹Based on Chi-Square tests

on results of Chi-Square analyses, it was concluded that potentially confounding variables (e.g., sex, major) were not systematically related to the experimental factors.

HYPOTHESES TESTING: TWO APPROACHES

In the conceptual model presented earlier, it was argued that the overall perception savings in a bundle offer (total transaction value) was positively influenced by two other perceptions: 1) perception of savings offered on the items (items' transaction value) and 2) perception of additional savings offered on the bundle (bundling transaction value). This argument was formally presented as hypothesis 1. It was also proposed that the influence of bundling transaction value on total transaction value would be more than that of items' transaction value (hypothesis 2). In the conceptual model, antecedents of these transaction value constructs were also identified and several relationships were posited between the constructs (hypotheses 3-8). And, finally, in three alternative hypotheses, it was argued that: 1) only bundling transaction value has an effect on total transaction value while items' transaction value has no effect (H1a); 2) only items' transaction value has an effect on total transaction value while bundling transaction value has no effect (H1b); and 3) neither items' transaction value nor bundling transaction value have any effect on total transaction value; instead, perception of savings are framed by buyers as a comparison of the bundle price with the sum of the regular prices of the individual bundle items (H1c).

In testing these hypotheses, two different approaches were adopted. The first approach focused on the insights that could be obtained from an analysis of variance (for H1 and H2) and multiple comparisons of different cells in the experimental design (for alternative hypotheses H1a-H1c). In the second approach, the LISREL causal modeling approach was followed. This latter approach provided an empirical test of the relational hypotheses (H3-H8). Additionally, it also provided an opportunity to again test hypotheses H1, H2, and the alternative hypotheses H1a-H1c. Results based on these analyses are now described, starting first with the ANOVA and multiple comparison approach.

INSIGHTS FROM ANOVA AND MULTIPLE COMPARISONS

Recall that a 3(savings offered on the items) X 3(additional savings offered on bundle) was employed in this investigation. Hypothesis H1 posited that the perception of overall savings in a bundle offer will be positively influenced by 1) perceived savings on the items and 2) perceived additional savings on the bundle. This hypothesis suggests significant main effects for both factors of the design with perception of overall savings (total transaction value) as the dependent variable.

Influence of Items' Transaction Value (H1)

Examination of ANOVA Results. The results of the analysis of variance with total transaction value as the dependent variable are shown in Table 34.

All the main effects and the interaction were statistically significant at $p < .001$. In this section, the main effect associated with the "Savings on Items" ($F(2,251) = 42.55, p < .001, \eta^2 = .153$) is examined. The effect size indicates that 15.3% of the variation in total transaction value was accounted by the savings offered on the items. The effect size f associated with the reported F statistic was 0.43. According to Cohen and Cohen (1975), this magnitude of f would be categorized as a large effect size.

Clearly, the analysis of variance results showed good support for the theoretical argument that perception of overall savings in a bundle offer is influenced by perception of savings offered on the items (H1). The hypothesized positive influence of items' transaction value is explored in the next section using multiple comparisons.

Examination of Mean Scores. To obtain a closer look at the directional effect of items' transaction value, mean scores of total transaction value were examined in different cells of the experimental design. These mean scores are shown in Table 35 and will be referred to frequently in the discussion presented in this chapter. Means of total transaction value were examined in the following cells in the vertical columns of the design (cells 1, 4, 7; 2, 5, 8; 3, 6, 9).

Means in each vertical column of the design shows changes in total transaction value as savings offered on the items were increased (with additional savings offered on the bundle held constant). In each of these vertical columns, the increasing trend of total transaction value was evident. For example, when additional savings offered on the bundle was \$0, total transaction value was enhanced from 1.79 to 4.17 as savings

TABLE 34
ANOVA RESULTS OF TOTAL TRANSACTION VALUE
AS DEPENDENT VARIABLE

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>p</u>	<u>(eta)²</u>
Savings on Items	102.88	2	51.44	42.55	0.000	0.153
Additional Savings on Bundle	254.01	2	127.00	105.06	0.000	0.377
Interaction	22.79	4	5.70	4.71	0.001	0.034
Error	293.75	243	1.21			
Total	673.42	251	2.68			

TABLE 35
SUMMARY STATISTICS OF THE DEPENDENT VARIABLE
TOTAL TRANSACTION VALUE IN DIFFERENT CELLS OF THE DESIGN

Means and Standard Deviations

		Additional Savings Offered on the Bundle				
		\$0	\$20	\$40	Row Mean and SD	
Savings Offered on the Items	\$0	1.79 (0.82) 1	4.13 (1.20) 2	5.16 (0.88) 3	3.70 (1.72)	
	\$20	3.59 (1.33) 4	5.07 (0.97) 5	5.68 (1.16) 6	4.79 (1.45)	
	\$40	4.17 (1.69) 7	5.63 (0.82) 8	5.83 (0.66) 9	5.21 (1.36)	
	Column Means and SD:		3.19 (1.66)	4.95 (1.18)	5.56 (0.96)	

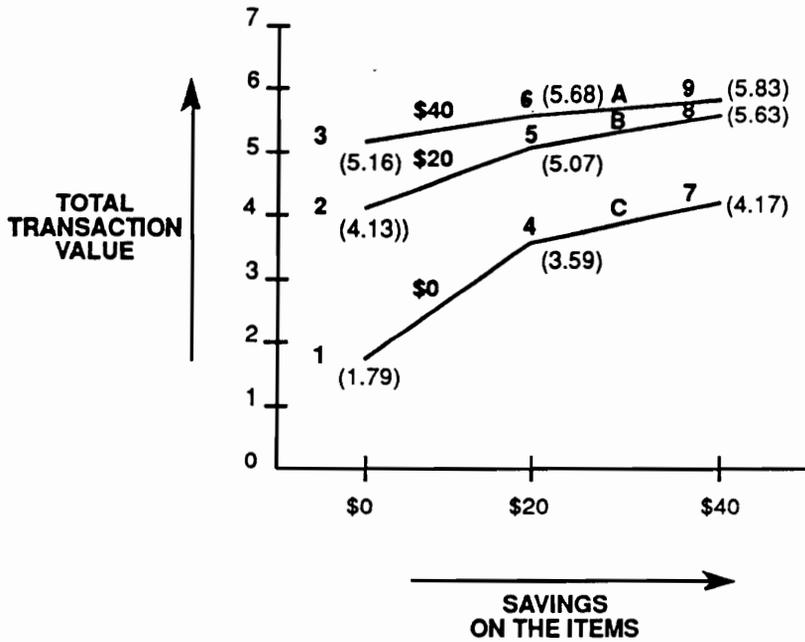
NOTE: 1. Standard deviations are shown in parentheses
 2. Statistics based on a balanced design of 28 subjects in each cell, N = 252

offered on the items were increased from \$0 to \$40 (see cells 1, 4, and 7). The same pattern of increasing total transaction value can be observed in the other two vertical column of the design. The row means shown at the right end of the table capture the aggregate impact of increasing savings offered on the items. The row means also reflected a similar increasing trend, from 3.70 to 5.21.

Figure 25 represents the above results graphically. Savings on items are shown on the horizontal axis and total transaction value is plotted on the vertical axis. Each curve pertains to the effect (on total transaction value) as savings on items were increased with additional savings offered on the bundle being held constant. For example, curve C captures the effect of increasing savings offered on the items when the additional savings offered on the bundle were \$0 (i.e., no savings at all). Curves B and C refer to the situations where the additional savings on the bundle were \$20 and \$40, respectively.

Obviously, increasing savings offered on the items lead to enhanced perceptions of overall savings in the bundle offer (i.e., total transaction value). Each of the three trends labeled A, B, and C was tested using contrasts and was found to be significant (A: $t(81) = 2.72$, $p = .00$; B: $t(81) = 5.56$, $p = .00$; C = 6.72, $p = .00$).

The mean scores, along with the results of analysis of variance, were interpreted to imply that the hypothesized positive effect of savings offered on items (H1) was supported.



NOTE:

1. Numbers in parentheses denote mean scores of Total Transaction Value.
2. Integers 1,2,3... alongside the parentheses indicate cell numbers of the experimental design.
3. The dollar figure on each curve indicates additional savings offered on the bundle.

FIGURE 25. EFFECT OF SAVINGS OFFERED ON ITEMS

Influence of Bundling Transaction Value (H1)

A similar set of analyses were conducted to examine the effect (on total transaction value) of additional savings offered on the bundle. First, the results of the analysis of variance are presented. Subsequently, the mean scores are examined in different cells of the experimental design.

Examination of ANOVA Results. As shown in Table 34, the main effect associated with additional savings on the bundle was significant ($F(2, 251) = 105.06, p < .001, \eta^2 = .377$). This effect accounted for 37.7% of the variation in the dependent variable total transaction value. The effect size (f) for the reported F value was 0.78, a large effect (Cohen and Cohen 1975).

Examination of Mean Scores. Insights yielded by this analysis were similar to the ones described above when the focus was on the effect of items' transaction value. Hence, in this section, only a brief account will be presented.

The mean scores in Table 35 were examined to assess the effect of additional savings offered on the bundle. Whereas vertical columns were examined in the above discussion, this time the focus is on the horizontal rows (cells: 1, 2, 3; 4, 5, 6; 7, 8, 9). Mean scores in these rows demonstrated that increasing the additional savings offered on the bundle had an enhancing effect on total transaction value. In cells 1, 2, and 3, for example, total transaction value increased from a low of 1.79 to a high of 5.16 as the additional savings were increased from \$0 to \$40. Similar effects can be observed in the other two horizontal rows of cells.

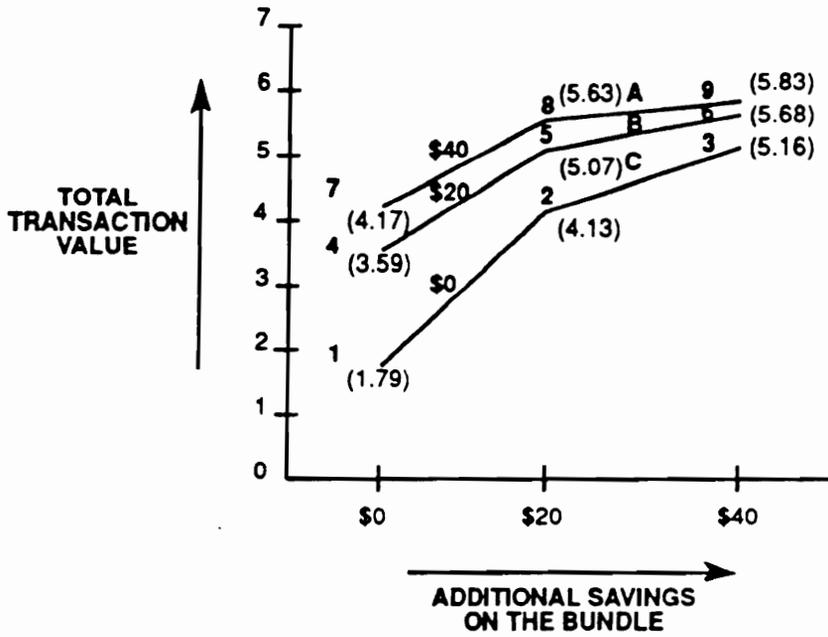
The column means shown at the bottom of the columns also reflect a similar increasing effect.

To examine these trends graphically, see Figure 26. The three curves labeled A, B, and C refer to the three horizontal rows mentioned above. For example, the curve labeled A pertains to the situation where savings offered on the items were \$40. The increasing trends were tested using contrasts and were found to be significant (A: $t(5.38)$, $p = .00$; B: $t(81) = 6.74$, $p = .00$; C: $t(81) = 12.85$, $p = .00$). Before the interaction effects are discussed, the relative magnitude of main effects is compared in the next section.

Comparison of the two Influences (H2)

In hypothesis 2, it was argued that the influence of bundling transaction value would be greater than the influence of items' transaction value. The focus of this section being on insights that were obtained from the analysis of variance, it may be instructive to address the issue of relative influence from an effect size perspective.

Recall that, in the ANOVA results presented above, items' transaction value accounted for 15.3% of the variation in the dependent variable total transaction value. In contrast, bundling transaction value accounted for more than twice that percentage (37.7%). Effect size (f) associated with items' transaction value and bundling transaction value was 0.43 and 0.78, respectively. These numbers suggest that, compared to the influence of savings offered on the items, the influence of additional



NOTE:

1. Numbers in parentheses denote mean scores of Total Transaction Value.
2. Integers 1,2,3... alongside the parentheses indicate cell numbers of the experimental design.
3. The dollar figure on each curve indicates the savings offered on the items.

FIGURE 26. EFFECT OF ADDITIONAL SAVINGS OFFERED ON THE BUNDLE

savings offered on the bundle is greater. This implies support for hypothesis 2. As indicated above, a further examination of this hypothesis will have to wait till the LISREL causal model is presented and the path coefficients can be compared.

Interaction Effects

No hypotheses were posited about the joint influence of items' transaction value and bundling transaction value on total transaction value. However, the ANOVA results indicated an interaction between these two constructs ($F(4,251) = 4.71, p < .001, \eta^2 = 0.034$). Admittedly, the percentage of variance in total transaction value associated with this interaction was quite low (3.4%) as compared to the larger numbers for the main effects (15.3% and 37.7%). However, the effect size, f , associated with the interaction was 0.19, which would be categorized as being between small and medium (Cohen and Cohen 1975). Hence, the interaction effect was analyzed in more detail.

A Note on Interaction Effects. Rosenthal and Rosnow (1984) have cautioned that misinterpretations of interaction effects are "one of the most common methodological errors made. The nature of the error is almost always the same: the effects of the interaction are not separated from the main effects" (p.277). According to these authors, the trends shown in Figure 25 and 26 would represent three types of effects: 1) main effect of items' transaction value, 2) main effect of bundling transaction value, and, 3) interaction. In other words, the plots show the overall results and the

slightly nonparallel lines do not represent the interaction effect alone. In order to understand the effect of the interaction alone, the authors recommend that the main effects should be removed first.

Hence, in this investigation, the interaction effect was examined by first removing the main effects. In Table 35 the cell, row, and column means are reported. The grand mean (i.e., mean of all cells) was 4.57. Then, according to Rosenthal and Rosnow (1984),

$$\text{cell mean} = \text{grand mean} + \text{row effect} + \text{column effect} + \text{interaction effect},$$

where row effect is row mean minus the grand mean; column effect is the column mean minus the grand mean. Using the equation shown above, the interaction effect was determined for each cell of the design.

Interpretation of the Interaction Effect. The interaction effect for each cell is shown below:

	Additional Savings Offered on the Bundle			
	\$0	\$20	\$40	
Savings Offered on Items	\$0	-.53	.05	.47
	\$20	.18	-.10	-.10
	\$40	.34	.04	-.37

Numbers in the above matrix represent the joint effect of 1) savings offered on the items and 2) additional savings offered on the bundle, after the main effects have been removed. Values close to zero imply no interaction effect, whereas larger values (+ or -) suggest interaction. Positive values, in the context of this experiment, represent an increase in total transaction value due to the interaction effect; negative values imply a decrease in total transaction value.

What inferences can be drawn from the interaction effects shown above? First, note that the first row represents an evaluative situation

where additional savings offered on the bundle are increased in the absence of any savings on the items. The second and third rows, in contrast, represent the situation where additional savings are offered on the bundle in the presence of savings on the items.

Now observe that, in the first row of numbers, the interaction effects indicate an increasing trend--from $-.53$ to $.47$. This implies that increasing the additional savings on the bundle enhanced total transaction value due to the interaction effect alone. In contrast, numbers in the second and third rows show a decreasing trend (from positive to negative)--implying a decreasing effect on total transaction value. These differences lead to the following interpretation: due to interaction alone, the effect of increasing bundling transaction value in 1) the presence and 2) the absence of savings on items is different. Specifically, due to interaction alone, increasing additional savings on the bundle increases total transaction value in the absence of savings on the items; in the presence of savings on the items, total transaction value is decreased. Alternatively, the interaction effect can be interpreted to imply that the joint effect of bundling transaction value and items' transaction value is positive when one of the transaction values is small relative to the other; the joint effect is negative when both transaction values are either small or large.

As remarked earlier, no hypotheses focusing on interaction were offered in the conceptual development. The analysis of the interaction effects described above, however, indicates that interaction between 1) perceived savings on the items and 2) perceived additional savings on the

bundle influences perceptions about overall savings in a bundle offer. In the next chapter, the need to explore this (potentially interesting) effect will be developed in greater detail when future research directions are discussed.

Testing Alternative Hypotheses (H1a, H1b, H1c)

Hypothesis 1 proposed that total transaction value is influenced by two perceptions: items' transaction value and bundling transaction value. Furthermore, hypothesis 2 added the argument that the influence of bundling transaction value would be greater than that of items' transaction value. In contrast with these two hypotheses, three alternative hypotheses were also proposed: 1) that only bundling transaction value had an effect on total transaction value and items' transaction value had no effect (H1a), 2) that only items' transaction value had an effect on total transaction value and bundling transaction value had no effect (H1b), and 3) neither items' transaction value nor bundling transaction value had any effect; instead, the perception of overall savings on the bundle were framed by buyers as a comparison of the bundle price and the sum of the regular prices of the items (H1c). In this section, results of testing these three alternative hypotheses are discussed.

Items' Transaction Value has no Effect (H1a)

This hypothesis states that only bundling transaction value has an effect on total transaction value; items' transaction value has no effect. First, note that results of the analysis of variance provide strong evidence against this hypothesis. The main effect of the factor "savings on items" was significant ($F(2,251) = 42.55, p < .001$), it accounted for 15.3% of the variation in total transaction value, and the effect size, f , was 0.43. Given this evidence, it would be very difficult to argue (as H1a does) that savings offered on the items have no effect on the perception on overall savings in a bundle offer.

Another way of empirically examining the validity of H1a could be to employ the method of multiple comparisons. This approach would require the identification of those cells in the experimental design in which the additional savings offered on the bundle was the same. Then, if H1a was valid, total transaction value should not be significantly different across these cells.

Figure 23 shows the price stimuli employed in different cells of the design. An examination of this figure reveals that the additional savings offered on the bundle in different cells of the design was as follows: cells 1, 4, 7: \$0; cells 2, 5, 8: \$20; cells 3, 6, 9: \$40. Then, according to H1a, there should be no significant differences in total transaction value in cells 1, 4, and 7, and the same argument also applies to the other two sets of cells (2, 5, 8; 3, 6, 9).

Duncan's multiple range tests were conducted in each of the three sets of cells mentioned above. Although the alternative hypothesis sug-

gests that no differences should be found, several differences were found. Specifically, the mean of total transaction value was found to be significantly different ($p < .05$) in the following pairs of cells: (1, 4), (1, 7); (2, 5), (2, 8), (5, 8); (3, 6), (3, 9), (6, 9). These differences, when the hypothesis suggests none, implies that the alternative hypothesis H1a is not supported.

Bundling Transaction Value has no Effect (H1b)

According to this alternative hypothesis, only items' transaction value has an effect on total transaction value; bundling transaction value has no effect. Again, the method of multiple comparisons was used to assess the validity of this alternative hypothesis. Before these analyses are reported, note that the analysis of variance results did not support this alternative hypothesis--a significant main effect of the factor "additional savings offered on the bundle" was found ($F(2, 251) = 105.06$, $p < .001$; effect size $f = .78$). This strong effect goes against this alternative hypothesis'assertion that additional savings offered on the bundle has no effect on total transaction value.

Using the approach of multiple comparisons to test the alternative hypothesis H1b, those cells in the design were identified in which the savings offered on the items were the same. Then, if only the savings on the items have an effect on total transaction value, no significant differences in total transaction value should be found in these cells. As shown in Figure 23, total savings offered on items was as follows: cells

1, 2, 3: \$0; cells 4, 5, 6: \$20; cells 7, 8, 9: \$40. Hence, according to the alternative hypothesis H1b, the mean of total transaction value in the three cells of each set should not be different. For example, the means in cells 1, 2, and 3 should be the same.

However, several differences were found using Duncan's multiple range tests. The mean score of total transaction value was found to be significantly different ($p < .05$) in the following pairs of cells: (1, 2), (2, 3), (1, 3); (4, 5), (4, 6); (7, 8), (7, 9). These differences, along with the evidence provided by the analysis of variance, suggest that the alternative hypothesis H1b is not supported.

Items' and Bundling Transaction Values have no Effect (H1c)

In this alternative hypothesis, it was proposed that savings on the items and the additional savings offered on the bundle have no role in the formation of perception of overall savings in a bundle offer. Instead, according to this alternative hypothesis, the perception of overall savings in a bundle offer are framed by buyers as a comparison of the bundle price and the sum of the regular prices of the items

To test this alternative hypothesis using the method of multiple comparisons, those cells were identified in Figure 23 in which the difference (bundle price - sum of regular prices of items) was the same. In cells 2 and 4 this difference was \$20 (\$198 - \$178). Similarly, in the diagonal cells 3, 5, and 7, this difference was \$40; in cells 6 and 8 it

was \$60. According to the alternative hypothesis H1c, cells associated with the same difference should have the same total transaction value.

The results were mixed. Means in cells 2 and 4 were not statistically different ($t(54) = 1.59, p = .11$). The means in cells 6 and 8 were also not different ($t(54) = .10, p = .421$). However, means in the diagonal cells 3, 5, and 7 were different ($F(2, 81) = 5.47, p = .006$); Duncan's multiple range tests indicated that means in the following pairs of cells were significantly different ($p < .05$): (5, 7), and (3, 7).

How can this seemingly conflicting evidence be resolved? One approach could be to develop a causal model based on this alternative hypothesis and examine its overall fit and the percentage of total transaction value explained by the model. Results based on this causal modeling approach will be presented in a later section of this chapter when the alternative LISREL models are presented and tested.

Summary of Anova Results

This section focused on the empirical tests of hypotheses 1 and 2 and the alternative hypotheses H1a, H1b, and H1c. These tests were based on the results of analysis of variance and multiple comparisons. The results of the analysis of variance found strong main effects for the two factors of the 3(savings on the items) X 3(additional savings on the bundle) design. These strong effects (effect size f was .43 and .78) suggested that, as hypothesized, savings offered on the items and additional savings offered on the bundle influence perceptions of overall

savings in a bundle offer. In addition, the larger effect size associated with additional savings offered on the bundle was interpreted to imply that, consistent with H2, influence of this factor was stronger (than influence of the other factor).

In addition to the analysis of variance results, multiple comparisons were conducted to test the alternative hypotheses. There was strong evidence against the alternative hypotheses H1a and H1b. However, empirical tests pertaining to the alternative hypothesis H1c yielded mixed results. It was pointed out that, in this chapter's section on causal modeling, alternative hypothesis H1c will be examined again to resolve the issue more definitively.

INSIGHTS FROM CAUSAL MODELING

In the conceptual development presented earlier in Chapter II, and briefly reviewed in Chapter V, it was argued that perceptions of overall savings in a bundle offer are influenced by two perceptions: 1) perception of savings offered on the bundle and 2) perception of additional savings offered on the bundle. This argument formed the basis for hypotheses 1 and 2. Furthermore, in the conceptual development, antecedents of these two perception were identified and the relationships between the six constructs of the model were hypothesized. These hypothesized relationships were translated into hypotheses H3 to H8. Additionally, three alternative hypotheses were also developed.

Although hypotheses 1 and 2 and the alternative hypotheses have been tested using the results of analysis of variance and multiple comparisons, relational hypotheses H3-H8 have not been empirically tested. Furthermore, the overall soundness of the proposed conceptual model (shown in Figure 12) has not been assessed. Causal modeling provided an excellent methodological vehicle to examine these unexplored issues (see Bagozzi 1980). In the sections that follow, a brief description of this methodology will be presented first. Subsequently, results based on the proposed causal model will be used to test the hypothesized relationships and several alternative hypotheses. The overall soundness of the model will also be assessed.

LISREL-VI and the Methodology of Causal Modeling

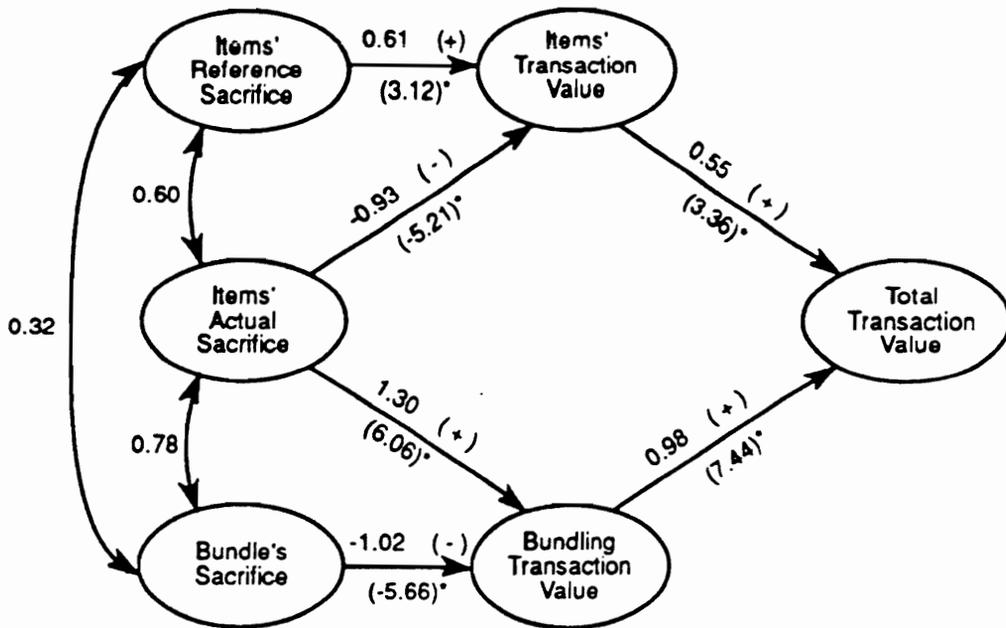
Causal models are "used to specify the phenomenon under study in terms of putative cause and effect variables and their indicators" (Joreskog and Sorbom 1986, p. I.1). LISREL-VI is the name of the computer program developed by Joreskog and Sorbom (1982, 1986) which facilitates the empirical testing of causal models. The focus of this chapter being methodological, no attempt will be made to review the conceptual and/or philosophical underpinnings of causal modeling. Instead, the emphasis will be on providing a brief description of the computer program LISREL-VI which was employed in this investigation. An excellent discussion of the underlying philosophy, and the applicability of causal modeling to empirical investigations in marketing, is available in Bagozzi (1980).

LISREL is a general purpose computer program designed to estimate linear structural equations. Variables in these structural equations can either be directly observable, or they can be unobserved latent variables with suitable indicators. In fact, the program's ability to model unobserved latent variables makes it particularly applicable to theory construction and testing in marketing where relationships between unobserved constructs are frequently posited.

In general, a LISREL model consists of two parts: the measurement model and the structural equation model. The measurement model pertains to the measurement of the latent constructs with multiple indicators; relationships between latent variables are modeled using structural equations. The program provides statistics which can be used to assess the quality of both the measurement and structural equation parts of the model. The quality of the measurement model refers to how well the indicator variables operationalize the latent constructs. Assessing the quality of the structural equations of the model pertains to the validity of the hypothesized relationships between the constructs. These statistics, along with others, will be used in the following sections to examine the soundness of the model proposed in this dissertation.

Modeling the Proposed Model using LISREL-VI

The model tested using LISREL is shown in Figure 27. The sign (+ or -) of the hypothesized relationships is indicated in parentheses on the causal links between the constructs. The parameter estimates and summary



Goodness of Fit Measures:

1. Chi-Square with 177 df = 375.99, p = 0.00
2. Goodness of Fit Index = 0.826
3. Adjusted Goodness of Fit Index = 0.774
4. Coefficient of Determination for:
 - Structural Equations = 0.878
 - x - variables = 0.980
 - y - variables = 0.997

NOTE:

1. Signs (+ or -) of the hypothesized relationships are shown in parentheses
2. t-values are shown in parentheses below the estimates; * indicates p < 0.05
3. Curved lines joining the sacrifice constructs represent covariances

FIGURE 27. LISREL ESTIMATES OF THE HYPOTHESIZED RELATIONSHIPS

statistics shown below the model are discussed shortly. First, details of how the model was specified using LISREL are presented.

Latent Variables and their Indicators

The first step in developing the LISREL model was to identify the latent variables, their indicators, and the hypothesized relationships between the latent variables. The latent variables and the relationships corresponding to hypotheses H3-H8 are shown in Figure 27.

Each of the six constructs shown in the figure had multiple indicators. Specifically, four items were employed for each of the perceived savings constructs (items' transaction value, bundling transaction value, and total transaction value). For each of the perceived sacrifice constructs (items' reference sacrifice, items' actual sacrifice, and bundle's sacrifice), three items were used. These multiple items were identified as indicators in the LISREL model shown in Figure 27.

Type of Matrix Analyzed

In general, a matrix specifying the relationships between the indicator variables is analyzed by the LISREL program. Two types of matrices most commonly employed are the correlation matrix and the covariance matrix. The correlation matrix, however, can result in inappropriate estimates (Bentler and Chou 1987) and the standard errors of the maximum likelihood estimates may be overestimated (Babakus, Ferguson, and

Joreskog 1987). Hence, in this investigation, the covariance matrix between the indicator variables was used. A few details about this matrix will now be discussed.

Recall that, in cells 1, 2, and 3 of the experimental design (see Figures 22 and 23), only two pieces of price information were provided as stimuli: regular prices of the items and the bundle price. No sale price information of the individual items was provided. This method of presenting price stimuli was necessitated by the decision to have \$0 (i.e., no savings) as one level of the factor "savings offered on the items." Hence, the construct items' actual sacrifice (perception of monetary sacrifice associated with the sale prices of the items) was not relevant in cells 1, 2, and 3 and was not operationalized in those cells. If data from cells 1, 2, and 3 had been used along with data from the other cells to construct the covariance matrix (between indicators) for LISREL, all covariances would not have been based on the same sample size and would be inappropriate for use in estimation (Long 1983). Hence, it was decided that the covariance matrix to be analyzed by LISREL should be based only on data from cells 4-9. This ensured that elements in the covariances in the covariance matrix would not be based on unequal sample sizes.

Goodness of Fit of the Proposed Model

Several measures of the overall fit of the model provided by LISREL are shown below the causal model in Figure 27. Before a substantive in-

terpretation of these numbers is made in applications of LISREL, it is usually suggested that the identification status of the model be assessed (Joreskog and Sorbom 1986). If the model is not completely identified, it implies that some parameters in the model cannot be uniquely determined. In such situations, a meaningful interpretation of the LISREL estimates cannot be made. The proposed model, however, was found to be identified and there were no error messages from LISREL indicating a potential problem with identification. The goodness of fit measures of the proposed model are now discussed.

The χ^2 Statistic. The χ^2 statistic provided by LISREL is a measure of how good the model is as compared to a null model in which the covariance matrix is completely unconstrained (that is, constraints implied by the model are assumed to be absent). In other words, this statistic is a test of the following question: How do the constraints implied by the model compare with the alternative hypothesis of no constraints. Lower χ^2 values with $p > .10$ are usually considered good (Bagozzi 1980, p. 105). For the hypothesized model, the χ^2 was 375.99 with 177 degrees of freedom ($p = .000$). The criterion of $p > .10$ described above was therefore not satisfied.

However, this evidence does not suggest that the proposed model is unacceptable because Joreskog and Sorbom (1986) have cautioned against using the χ^2 as a test statistic. The χ^2 is a valid test statistic only when the underlying assumptions (e.g., of multivariate normality) are satisfied, but they are "seldom fulfilled in practice" (Joreskog and Sorbom 1986, p. I.39). Additionally, this statistic is sensitive to

changes in sample size. It can be concluded from this discussion that though the model's χ^2 turned out to be statistically significant, this does not suggest that the hypothesized model is unacceptable. Hence, other statistics provided by LISREL were examined to obtain additional insights about the proposed model.

Goodness of Fit Index. This statistic is a measure of the relative amount of variance and covariance jointly accounted for by the model. Larger values are considered as indications of a good model. Unlike the χ^2 statistic, this measure is not sensitive to sample size and is relatively robust against departures from multivariate normality. For the proposed model the goodness of fit index was 0.826, suggesting a reasonably good overall fit. The measure, adjusted goodness of fit, is analogous to the goodness of fit measure except that it is adjusted for the model's degrees of freedom. As shown in Figure 27, this measure was 0.774 for the proposed model.

Coefficients of Correlation and Determination. These statistics will be discussed referring to Table 36 where more detailed information is reported. In panel A, statistics from the measurement model are reported; panel B pertains to the structural equations model. In panel A, Y and X variables refer to indicators of the constructs pertaining to perceived savings and perceived sacrifice, respectively. The squared multiple correlation of X or Y variables is a measure of how well these indicators capture their respective latent constructs individually. The coefficient of determination reflects how well latent constructs are measured jointly by the indicator variables; higher values are preferred. As can be ob-

served in Table 36, squared multiple correlations were all quite high. The coefficient of determination of the Y variable was 0.997 and .980 for the X variables. These high values were expected given that, in an earlier section of this chapter, satisfactory reliability of the latent constructs was demonstrated.

In panel B of Table 36, statistics for the structural equations are reported. Interpretation of these statistics is similar to the one presented above for the X and Y variables. The squared multiple correlations are a measure of how well the variation in each latent constructs is accounted for by the hypothesized model. For example, numbers in the table suggest that 54% of the variation in the construct items' transaction value was accounted for by the model. The corresponding figure for the constructs bundling transaction value and total transaction value was 56.1%. Hence, it can be concluded that about 56.1% of the variation in the perception of overall savings in a bundle offer (total transaction value) were accounted for by 1) the perception of savings offered on the items and 2) the perception of additional savings offered on the bundle. Finally, the coefficient of determination shown at the bottom of panel B is 0.878, implying that about 87.8% of the variation in the constructs items' transaction value, bundling transaction value, and total transaction value was jointly explained by hypothesized relationships in the model.

TABLE 36
LISREL ESTIMATES OF THE HYPOTHESIZED
MODEL: SUMMARY STATISTICS

A. Measurement Model

1. Squared Multiple Correlations of Y-Variables

Items' Transaction Value	0.426	0.622	0.552	0.451
Bundling Transaction Value	0.653	0.818	0.861	0.847
Total Transaction Value	0.671	0.824	0.813	0.756

Total Coefficient of Determination: 0.997

2. Squared Multiple Correlations of X-variables

Items' Reference Sacrifice	0.331	0.619	0.625
Items' Actual Sacrifice	0.496	0.520	0.478
Bundle's Sacrifice	0.596	0.785	0.285

Total Coefficient of Determination: 0.980

B. Structural Equations Model

1. Squared Multiple Correlations of the Structural Equations

Items' Transaction Value	0.540
Bundling Transaction Value	0.561
Total Transaction Value	0.561

Total Coefficient of Determination: 0.878

Testing Hypothesized Relationships (H1-H8)

Signs of the hypothesized relationships (+ or -) are shown in parentheses in Figure 27. The path estimates provided by LISREL for the causal links are also shown, with the corresponding t-values in parentheses. All path estimates were statistically significant at $p < .05$. Note that the path estimates are to be interpreted as being analogous to regression coefficients; they reflect the impact of one construct on the other.

Hypotheses H1, H7, and H8 posited a positive influence of items' transaction value and bundling transaction value on total transaction value. In hypothesis H2, it was further argued that the influence of bundling transaction value would be greater than the influence of items' transaction value. Both these hypotheses were supported by path estimates of the LISREL model. The path estimates of items' transaction value and bundling transaction value on total transaction value were 0.55 and 0.98, respectively. The sign, the relative magnitudes, and the statistical significance of the path estimates provide evidence supporting these hypotheses.

Hypotheses H3 - H8 posited (positive or negative) relationships between the constructs. The signs of the hypothesized relationships are shown in parentheses in Figure 27. As shown in the figure, items' reference sacrifice positively influenced items' transaction value, with the path estimate being 0.61 (H3). Items' actual sacrifice had, as hypothesized, a negative influence (-0.93) on items' transaction value (H4); and the influence on bundling transaction value was positive as expected (H5).

Hypothesis H6 was also supported--the path estimate from bundle's sacrifice to bundling transaction value was -1.02. As reported above, and shown in Figure 27, all path estimates were directionally correct and statistically significant at $p < .05$.

Testing Alternative Causal Models

One of the many strengths of the LISREL methodology is that it permits the exploration of alternative models. This exploration, especially when guided by theory, can lead to further theoretical developments (Bagozzi 1980). In the results reported above, the proposed conceptual model of a bundle's transaction value was found to have empirical support. The overall fit of the model was good and all the hypothesized relationships were supported. In this section, the following question is explored: Can any changes be made to improve upon the proposed model? Four alternative model forms that were examined are now discussed.

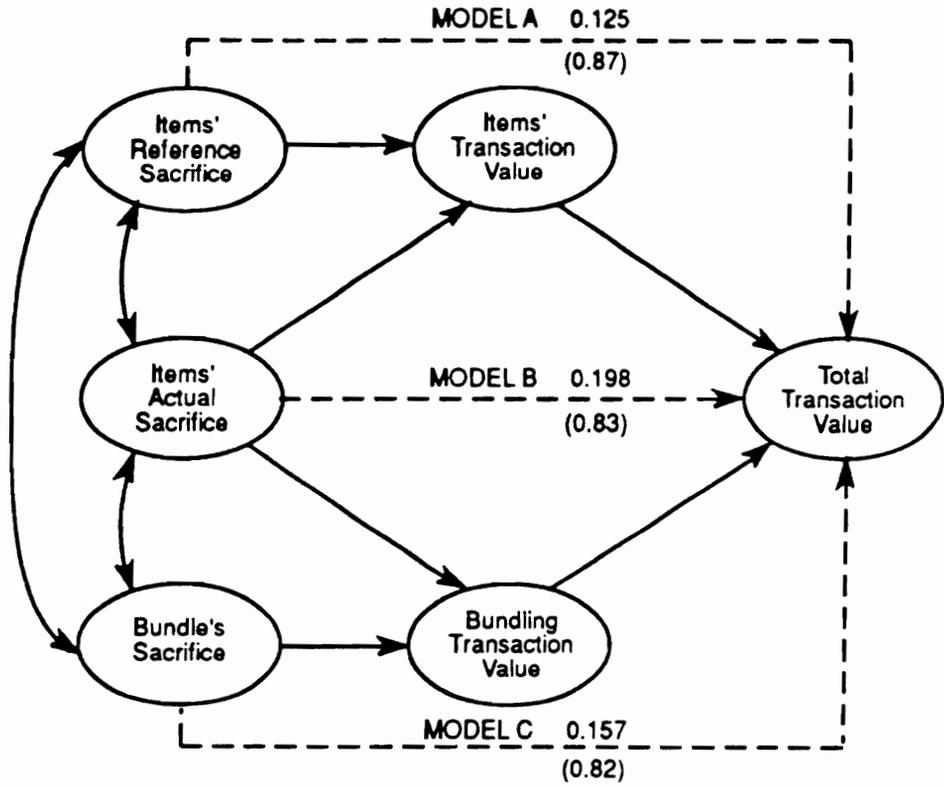
Modeling Additional Influences: Models A, B, and C

In the conceptual model shown in Figure 27, constructs pertaining to perceptions of sacrifice influence total transaction value only indirectly; the direct influences are on the constructs items' transaction value and bundling transaction value. In the discussion presented above, good support was found for these hypothesized relationships. However, it is also reasonable to argue that, in addition to the indirect influences,

perceptions of sacrifice may also have direct influences on total transaction value. Specifically, these direct influences suggest three alternative models which are shown in Figure 28 (with dashed lines) and labeled A, B, and C. Model A posits the possibility that, in addition to influencing items' transaction value, items' reference sacrifice also has a direct effect on total transaction value. Models B and C posit similar additional influences on total transaction value. The results of empirically examining these additional influences are now reported.

In Figure 28, path estimates are shown on the dashed lines with the corresponding t-values shown below in parentheses. None of the relationships hypothesized by the alternative model forms was statistically significant at $p < .05$. This evidence suggests that the contribution of the additional influences to the explanatory power of the original model was not substantial.

Another way to compare each of the alternative model with the original model is to examine the goodness of measures--especially the χ^2 values. Surprisingly, the alternative models A, B, and C yielded goodness of fit measures which were identical to each other. These measures are reported in the lower half of Figure 28. As each model posits a relationship in addition to the existing relationships, one degree of freedom was lost in estimating the additional path estimate. Hence the χ^2 had 176 degrees of freedom--one less than that of the original model presented earlier in Figure 27. The χ^2 of the original model was 375.99 with 177 degrees of freedom, compared to 375.32 with 176 degrees of freedom for the alternative model A. In the context of comparing alter-



Goodness of Fit Measures:

	Model A/B/C
1. Chi-Square with 176 df	375.32
2. Goodness of Fit Index	0.826
3. Adjusted Goodness of Fit Index	0.772
4. Coefficient of Determination for:	0.872
• Structural Equations	0.981
• x - variables	0.997
• y - variables	

NOTE:

1. t-values are shown in parentheses below the estimates. No estimate was significantly different from 0 at $p < 0.05$

FIGURE 28. EXPLORING ADDITIONAL INFLUENCES ON TOTAL TRANSACTION VALUE

native model forms using LISREL, Joreskog and Sorbom (1986) suggest that,
a

"large drop in χ^2 , compared to the difference in degrees of freedom, indicates that the changes made in the model represent real improvement. On the other hand, a drop in χ^2 close to the difference in number of degrees of freedom indicates that the improvement in fit is obtained by "capitalizing on chance," and the added parameters may not have real significance and meaning" (p. I.40)

In the present situation, the drop in χ^2 was 0.69, the difference in the degrees of freedom being 1. Hence, following the criterion described above, it was concluded that the additional influences posited by the alternative model forms are not supported.

Examination of the squared multiple correlations also lead to the same conclusion. As shown in Table 37, the additional influences posited in the alternative models A, B, and C resulted in a general decrease in the squared multiple correlations--with one exception; in model A, the squared multiple coefficients of the construct total transaction value increased slightly from 0.561 to 0.578. Note, however, that the coefficient of determination decreased for all the alternative models.

A Simplified Model: Model D

The model proposed in this dissertation is based on the premise that the perception of overall savings in a bundle offer is influenced by two other perceptions: 1) perception of savings offered on the items and 2) perception of additional savings offered on the bundle. Contrary to this premise, it can also be argued the constructs items' transaction value and bundling transaction value can be eliminated to yield a more

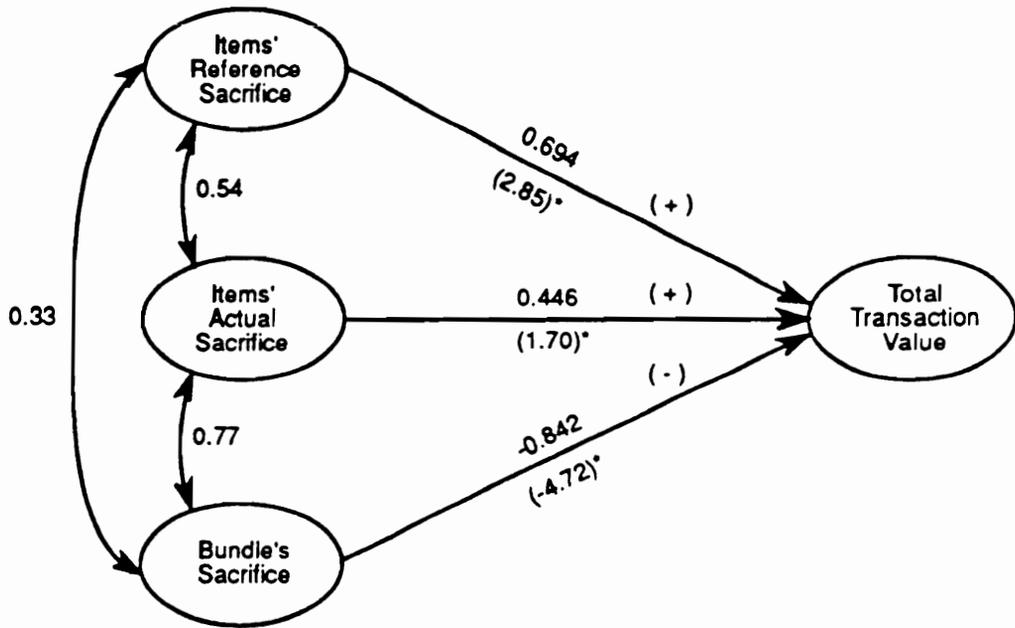
TABLE 37
 COMPARISON OF MODELS A, B, AND C
 WITH THE ORIGINAL MODEL

<u>Latent Variable</u>	<u>Squared Multiple Correlation</u>			
	<u>Original Model</u>	<u>Model A</u>	<u>Model B</u>	<u>Model C</u>
Items' Transaction Value	0.540	0.536	0.536	0.536
Bundling Transaction Value	0.561	0.558	0.558	0.558
Total Transaction Value	0.561	0.578	0.545	0.470
<hr/>				
Coefficient of Determination:	0.878	0.872	0.872	0.872

parsimonious model shown in Figure 29. In this simplified model, the three constructs pertaining to the perceptions of sacrifice are posited to have a direct influence on total transaction value. Removing the constructs items' transaction value and bundling transaction value does simplify the model considerably. It also provides an opportunity to test the alternative hypothesis H1c which yielded mixed results when tested using multiple comparisons. The alternative model D is now compared with the model proposed in this dissertation.

First, note the path estimates on the causal links in Figure 29 and the corresponding t-values shown below in parentheses. Examination of the t-values indicates that all path estimates were significant at $p < .05$. While bundle's sacrifice had a negative influence on total transaction value, the other two perceived sacrifice constructs had positive influences. Substantively, these path estimates imply that items' reference sacrifice and items' actual sacrifice appear to inflate the reference with which the bundle's sacrifice is compared. In this regard at least, the substantive interpretation of the path estimates is consistent with the conceptual model proposed in this dissertation. But which model is better?

The χ^2 s and the goodness of fit measures are not particularly useful to compare the competing models because the original model had two additional constructs (items' transaction value and bundling transaction value). The goodness of fit and adjusted goodness of fit indices of the alternative model D appear quite comparable to the original model. However, Joreskog and Sorbom (1986) have cautioned that "it can happen that



NOTE:

1. Signs (+ or -) of the hypothesized relationships are shown in parentheses
2. t-values are shown below the estimates in parentheses; * indicates $p < 0.05$
3. Curved lines joining the sacrifice constructs represent covariances

FIGURE 29. LISREL ESTIMATES OF THE ALTERNATIVE MODEL D

the overall fit of the model is very good but with one or more relationships in the model very poorly determined, as judged by the squared multiple correlations..." (p. I.41).

Guided by this cautionary note, the coefficient of correlation and the coefficient of determination figures of the alternative model were examined. As there is only one endogenous variable in the model, the squared multiple correlation is the same as the coefficient of determination.¹⁵ Recall that the squared multiple correlation is a measure of the relative variation in a variable explained by the hypothesized relationships. At the bottom of Table 38, this statistic is reported for the original model and the alternative model D. In the original model the squared multiple correlation for the latent variable total transaction value was 0.561, compared to 0.384 obtained for the alternative model D. These numbers imply that the original model explained 56.1% of the variation in total transaction value, while the alternative model explained only 38.4%. Hence, it can be concluded that the alternative model may be more parsimonious, but its ability to explain the variation in total transaction value is less than that of the original (and relatively more complex) model. Based on this evidence, the alternative hypothesis H1c is rejected.

¹⁵ Endogenous variables in a LISREL model are those that are determined internally in the model. In contrast, exogenous variables (e.g., items' reference sacrifice, items' actual sacrifice, and bundle's sacrifice) are determined outside of the model.

TABLE 38
COMPARISON OF ALTERNATIVE MODEL D
WITH THE ORIGINAL MODEL

<u>Criteria</u>	<u>Original Model</u>	<u>Model D</u>
A. Goodness of Fit Measures:		
1. Chi-sq	375.99 (177 df)	161.35 (59 df)
2. Goodness of Fit Index	0.826	0.870
3. Adjusted Goodness of Fit Index	0.774	0.799
 B. Structural Equations Model		
1. Squared Multiple Correlations of the Structural Equations:		
Items' Transaction Value	0.540	-----
Bundling Transaction Value	0.561	-----
Total Transaction Value	0.561	0.384
 2. Total Coefficient of Determination	 0.878	 0.384

Summary of Causal Modeling Results

In this section the methodology of causal modeling was employed to empirically examine the proposed conceptual model. Statistics provided by LISREL, the computer program employed to test the causal model, provided additional insights about the overall soundness of the proposed conceptualization. Examination of these statistics suggested good support for the model. The LISREL model was also used to test the hypotheses that had been examined earlier using analysis of variance and multiple comparisons. All hypotheses were supported. Additionally, several alternative model forms were also tested. However, the overall performance of these alternative model was not as good as the model proposed in this dissertation.

CHAPTER SUMMARY

Results of experiment 2 were discussed in this chapter. Two approaches were adopted to test the hypotheses: 1) based on analysis of variance and multiple comparisons and 2) based on causal modeling. Results of both approaches provided good support for the conceptual model proposed in this dissertation. Specifically, the central idea that perception of overall savings in a bundle offer is influenced by 1) perception of savings offered on the items and 2) perception of additional savings offered on bundle was supported. Additionally, as hypothesized, the relative influence of additional savings offered on the bundle was found to be greater. Statistics provided by the LISREL were used to further examine

the overall soundness of the proposed model. These statistics indicated that the overall fit of the proposed model was good, with 56.1% of the variation in total transaction value being explained by the model. Four alternative models were also explored, but their overall performance was not as good as that of the model proposed in this dissertation.

CHAPTER VII

CONCLUSION: CONTRIBUTIONS AND FUTURE RESEARCH DIRECTIONS

OVERVIEW

In this chapter, contributions of this research will be assessed and directions for future research will be presented. The last four chapters have focused on details of the two empirical investigations that were conducted in this dissertation. In this concluding chapter, the emphasis will be on examining the results and their implications from a broader substantive, conceptual, and methodological perspective.

The present chapter begins with a brief discussion of the salient unexplored issues that motivated this research. A synopsis of this investigation, focusing on conceptual issues and results, is then presented. With this discussion as a backdrop, the substantive, conceptual and methodological domains of this research are evaluated. Finally, several directions for future research are identified.

UNEXPLORED ISSUES THAT MOTIVATED THIS RESEARCH

Given the prevalence of bundling strategies in the market place, the practice of selling multiple items for a single price has long attracted

the attention of academicians. Historically, most investigations in this substantive area have approached it from a macroeconomics perspective, focusing on issues such as consumer welfare and the effect on competition. There are three major shortcomings of this stream of research: 1) its lack of emphasis on individual buyer behavior, 2) the abundance of analytical frameworks with very little empirical work, and 3) the lack of prescriptive guidelines for managerial decision making.

Typically, the approach adopted in this stream of research has been to develop analytical frameworks based on certain simplifying assumptions about the market and individual buyer behavior. Despite the evidence that results based on these analytical frameworks may be sensitive to the underlying assumptions about individual buyer behavior (e.g., Hanson and Martin 1987), the behavior of individuals in this substantive context remains largely unexplored. The analytical frameworks provide several insights about the market-level consequences of bundling strategies, but their ability to yield prescriptive guidelines for managerial decision making remains inadequate.

This dissertation research is based on the premise that the study of individual buyer behavior in the substantive context of bundling is important but has received inadequate research attention. In this dissertation, therefore, two conceptual models were developed that focused on how buyers evaluate bundle offers. Two empirical investigations were conducted to test different aspects of the conceptual model. The first investigation tested the hypothesis that buyers form an overall evaluation of a bundle of items by using an anchoring and adjustment process.

The second empirical investigation examined how price information in a bundle offer is used by buyers to form a perception of overall savings.

RESEARCH SYNOPSIS: CONCEPTUALIZATION AND RESULTS

Two conceptual models were developed and tested in this research. The first model focused on the formation of acquisition value in bundle offers, while the second model pertained to the formation of transaction value. The importance of the constructs acquisition value and transaction value has been well documented in the context of single-product evaluations (e.g., Monroe and Chapman 1987; Thaler 1985). The models proposed in this dissertation, therefore, represent extensions of single-product conceptualizations to the context of transactions involving multiple items.

Model of Bundle's Acquisition Value

Conceptualization. The model, shown in Figure 11, focused on the role of both price and non-price information. However, the primary emphasis of the conceptual development was on the processing of the non-price information. Specifically, it was proposed that the overall evaluation of a bundle will be formed by buyers using an anchoring and adjustment process. Three distinct stages were identified in the proposed anchoring and adjustment process: 1) scanning, 2) anchor selection and evaluation, and 3) adjustments.

In the scanning stage, it was argued, buyers determine which items are contained in the bundle. No evaluations are made during this stage. After the scanning stage, buyers initiate the evaluation process by selecting one item from the bundle which is perceived to be the most important. The evaluation of this item then serves as a starting point to initiate the evaluation of the whole bundle. It was also proposed that the remaining bundle items would be evaluated in a decreasing order of their perceived importance. Subsequent evaluations, when compared with the initial anchor evaluation, determine the direction of adjustments--adjustments would be upward if subsequent evaluations were better than the initial anchor evaluation, and would be downward if the subsequent evaluations were perceived as being worse than the anchor evaluation. Specifically, it was posited that the net effect of these adjustments is averaging.

Results. These arguments were well supported by experiment 1. Using computer software to monitor the order of information acquisition, it was found that the items in a bundle were examined in the decreasing order of perceived importance. There was also strong evidence to support the hypothesized averaging effect of the anchoring and adjustment process. The averaging effect was tested using two analytical approaches: 1) analysis of variance and 2) multiple regression. As anticipated, the analysis of variance found a strong interaction effect between the two factors of the experimental design. Using multiple regression, the overall evaluation of a bundle was modeled as a dependent variable with evaluations of the bundle's individual items as the predictor variables.

The hypothesized weighted averaging effect was then empirically examined by statistically testing the following constraint: sum of predictor variables' coefficients = 1.0. The weighted-average hypothesis represented by this constraint was supported for both the 2-item and 3-item bundles that were used as stimuli in experiment 1.

An additional hypothesis tested in this investigation focused on the effect of anchor evaluation on the evaluation of other items in a bundle. Descriptions of the anchor items in this investigation were manipulated to suggest either excellent or poor quality; descriptions of the other items were manipulated to suggest moderate quality. In the context of these manipulations, it was hypothesized that the moderate evaluation of the non-anchor items would be contrasted with the relatively more extreme evaluations (poor or excellent) of the anchor. The net effect of this contrast effect was expected to increase the perceived difference between the anchor evaluation and the evaluation of the other bundle items. This hypothesis was not supported in this investigation. In the section on future research directions, alternative approaches to explore this hypothesis will be described.

Nature of Empirical Evidence. Experiment 1 focused on two specific hypotheses based on the anchoring and adjustment process: 1) that items perceived as more important are evaluated prior to less important items, and 2) that the overall evaluation of a bundle is a weighted average of its individual items' evaluations. Although these hypotheses were supported, two other aspects of the anchoring and adjustment process could not be explored in experiment 1.

First, the temporal nature of the adjustments was not examined. In the proposed anchoring and adjustment process, it was hypothesized that adjustments would be made after each item was evaluated. In experiment 1, however, only the aggregate effect of all adjustments was empirically tested. Protocols and other process tracing methods may be used in future research efforts to further explore this issue.

Second, the biasing effect caused by the order of examination could not be investigated in this experiment. One characteristic of the anchoring and adjustment process is that overall evaluations tend to be biased in the direction of the evaluation that is made first (i.e., the anchor evaluation). In experiment 1, perceived importance of the items was confounded with order of examination in that more important items tended to be examined prior to the less important items. As a result of this confounding, the potential biasing effect caused by order of examination and perceived importance could not be investigated separately of each other. Experiments that independently manipulate the order of examination and perceived importance may be necessary to further investigate these potential biasing effects.

Model of Bundle's Transaction Value

Conceptualization. The focus of this model was on how buyers form perceptions of savings in a bundle offer. The model (see Figure 12) is based on the premise that perceptions of overall savings in a bundle (total transaction value) are positively influenced by two other perceptions:

1) perception of savings offered on the items (items' transaction value) and 2) perception of additional savings offered on the bundle (bundling transaction value). It was argued that the effect of bundling transaction value would be greater than the effect of items' transaction value. These perceptions of savings were hypothesized to be influenced by perceptions of sacrifice caused by different pieces of price information presented in the bundle offer (see Figure 12).

Results. This model was empirically tested using two analytical approaches: 1) analysis of variance and multiple comparisons, and 2) the LISREL causal model. Both approaches supported the model and the hypothesized relationships. It was found that items' transaction value and bundling transaction value positively influenced the perception of overall savings in the bundle offer. Examination of the path coefficients in the LISREL model and effect sizes in the analysis of variance suggested that, as hypothesized, the effect of bundling transaction value was greater than that of items' transaction value. Statistics such as goodness of fit, squared multiple correlation, and coefficient of determination provided by LISREL indicated that, overall, the proposed conceptual model was sound.

In addition to the proposed model, three alternative hypotheses were also tested using analysis of variance and multiple comparisons. The LISREL causal modeling approach also provided the opportunity to test the validity of four alternative model forms. The alternative hypotheses tested in this investigation were rejected, providing further evidence supporting the proposed conceptual model.

Implications for Managing Bundling Strategies

The primary emphasis of this research was on developing and testing a conceptualization that focused on the evaluation of bundle offers. As noted above, the existing body of literature on bundling has paid inadequate research attention to the study of buyers in the substantive context of bundling. Theory application (Calder, Phillips, and Tybout 1983) being the dominant concern, contributions of this research are primarily theoretical. However, based on this investigation, a few suggestions can be offered to aid the management of bundling strategies in the market place.

Bundle Selection Criteria. Firms often have to decide whether they should offer some of their products as bundles. The normative framework developed by Gultinan (1987) provides specific conditions when a bundling strategy will enhance profitability. Similarly, some analytical models are presently available (e.g., Hanson and Martin 1987; Kinberg and Sudit 1979) which can compute the profitability of alternative bundling strategies. As discussed below, results of this research can complement these analytical approaches.

Once a decision is made to adopt a bundling strategy, firms typically face a large number of bundling options. In general, a firm with a product line of n items can theoretically offer $2^n - 1$ types of bundles (i.e., bundles of size 2, 3, ..., n). Even when the value of n is quite small, say 10, the number of bundling options ($2^{10} - 1 = 1023$) can be overwhelming. Which of these numerous bundles should a firm actually offer on the market?

Generally, the analytical frameworks recommend that managerial judgment be used to reduce the bundling options to a reasonable number. Once a set of bundling options is selected, the analytical models can be used to determine their profitability. The present research showed that the overall evaluation of a bundle of items is a weighted average of its individual items' evaluations. Based on this finding, one managerial strategy to reduce the number of bundling options could be to identify an anchor item and then eliminate those non-anchor items (as potential bundle items) whose perceived quality is considerably less than that of the anchor item.

For example, a firm may decide not to bundle its computer (the anchor item) and printer if the perceived quality of the printer is found to be much less than that of the computer. Alternatively, one criterion for selecting items to bundle could be to identify those non-anchor items whose evaluations is better than or equal to that of the anchor item. These considerations may be used in addition to other criteria suggested in the literature (e.g., Gultinan 1987).

Guiding a Quality Improvement Program. Results of this research indicate the overall evaluation of a bundle is not influenced equally by all items in the bundle. Specifically, the anchor item was found to have the greatest influence. Traditional market research methods can be employed to identify the relative importance of different items in a bundle. This information can then be used to guide efforts to improve overall perceptions about a bundle offer by identifying and prioritizing those items that have a substantial impact on the overall evaluation of the bundle.

Presenting Price Information. Analytical models in economics (e.g., Schmalensee 1984) have demonstrated that a mixed bundling strategy is usually the most profitable one. Recall that in a mixed bundling strategy, buyers are provided the opportunity to buy items either individually or as a bundle. In a mixed bundling strategy, therefore, sellers have to price the bundle and its individual items. To enhance sales, sellers have the option of offering savings on 1) only the items, 2) only on the bundle, or 3) on the items and the bundle.

The present investigation found that perception of overall savings in bundle offer are positively influenced by 1) perceived savings on the items and 2) perceived savings on the bundle. Hence, savings offered on the items may improve perceptions of savings not only of the items, but also of the bundle offer as a whole. Assuming that perceptions are, at least partly, determinants of actual purchase behavior, some suggestions for pricing bundles and their items can be offered based on the results of this research. It appears that, instead of offering one large saving on a bundle to encourage sales of the bundle, dividing up those savings on the items and the bundle may generate more unit sales. For example, offering a \$20 saving on the items and \$20 on the bundle may increase total sales more than offering \$40 in savings on the bundle alone. This pricing tactic has the advantage of attracting sales (by presenting financial incentives) from two different types of buyers: 1) those interested in purchasing only the individual items, and 2) those wishing to purchasing the complete bundle. However, to determine which pricing tactic is better in a specific competitive context, the decision maker

may need to know how many bundle sales will be lost by lowering bundle savings versus the item sales gained.

EVALUATION OF THIS RESEARCH

The task of evaluating a research endeavour focuses attention on many pertinent questions: Which procedure should be used to evaluate a research contribution? And, which criteria are appropriate? These questions, especially in the context of interdisciplinary research, tend to become controversial because rarely is there unanimous agreement on what constitutes "good" answers (see Ozanne, Fern, and Yadav 1989). As the discipline of marketing gradually acquires a stronger interdisciplinary flavor, a satisfactory resolution of these issues has become more and more important. In the context of this chapter, a full discussion of these issues is neither necessary nor possible. However, the evaluative framework suggested by Ozanne, Fern, and Yadav (1989) will be briefly described before it is employed to evaluate the present research.

Evaluative Framework Used

The evaluation process suggested by the framework is shown in Figure 30. Because differences in the paradigm of a research piece (Kuhn 1962) and the paradigm of a reader of that research can potentially bias the evaluation process, these differences should be explicitly recognized before the evaluation process is initiated. Hence, first, the focal re-

search is categorized as paradigmatic, lateral, or rival paradigmatic. These three types of research represent varying degrees of deviation between the paradigm represented by a research piece and the paradigm of the reader. If the paradigms of the research and the reader are the same, the research is paradigmatic. Lateral research represents the situation where the research being evaluated is on the "fringes" of the reader's paradigm--agreement may exist on underlying assumptions, but there may be differences on one or more of the substantive, conceptual, and methodological domains. Rival paradigmatic research is one that differs completely from the paradigm of the reader.

After the focal research is categorized, its substantive, conceptual, and methodological domains are then clearly identified (step 2). In step 3, the relevance of three types of criteria is ascertained: focal, antecedent, and consequent. Focal criteria evaluate a research on its own merits--that is, as the research stands by itself. Antecedent criteria refer to the evaluation of the research from an historical perspective. Consequent criteria are those that seek to assess the future impact of the research being evaluated.

In step 4, the specific criteria are explicitly identified for each domain. A collection of criteria presently in use by journals in marketing is shown in Figure 31. The blank spaces represent evaluative situations where explicit criteria are yet to be developed. In this chapter, the evaluation procedure described in Figure 30 and the evaluation criteria identified in Figure 31, are used to evaluate the (paradigmatic) research reported in this dissertation.

1. Determine Type of Focal Research
 - Paradigmatic
 - Lateral
 - Rival Paradigmatic
2. Establish Relevant Domains of Focal Research
 - Substantive
 - Conceptual
 - Methodological
3. Decide on Relevant Sets of Criteria for Each Domain
 - Focal
 - Antecedent
 - Consequent
4. List Specific Criteria Within Each Criterion Set
5. Evaluate Focal Research
6. Make Recommendations

Source: Ozanne, Fern, and Yadav (1989)

FIGURE 30. STAGES IN RESEARCH EVALUATION PROCESS

	Substantive	Conceptual	Methodological
Antecedent	Support conclusions	Conceptual evidence: use and quality Relevant literature cited	
Focal	Problem formulation Goal statement Relevance Issue importance	Theoretical logic Objectivity	Operationalization Sample relevance Data collection Appropriateness of analysis Design justification Interpretation Reliability and validity
Consequent	Likely interest Significance of contribution Potential contribution		

Source: Ozanne, Fern, and Yadav (1989)

FIGURE 31. EXISTING NORMATIVE CRITERIA IN EACH DOMAIN

Substantive Domain

Antecedent Criteria. As noted in the conceptual development presented in Chapter II, most research on bundling has originated in the economics literature. In the field of marketing, there are only a few studies that have explicitly focused on individual buyer behavior in the context of bundle offers (e.g., Gaeth and Levin 1987; Goldberg, Green, and Wind 1984). The empirical results of Gaeth and Levin's conceptualization are presently unavailable. However, a comparison with Goldberg et al.'s results can be made.

The study reported by Goldberg, Green, and Wind (1984) employed the hybrid conjoint approach to predict the preference for a bundle of hotel amenities. They found that the prediction rate based on their methodology was quite poor--only 38.9% individuals' "best" bundles were correctly predicted by their model. In the present study, overall evaluation of a bundle was predicted using the evaluations of its individual items as predictor variables in a linear regression model. The overall fit of these models was quite good (R^2 s ranged from .70 to .90). What conclusions can be drawn from a comparison of regression results with those based on the hybrid conjoint methodology?

First, note that the two studies are quite different from each other. Whereas the hybrid conjoint study attempted to predict an individual's "best" bundle of hotel amenities, the present study focused on fitting a linear regression equation using results from the entire sample. Also, their stimuli could be considered multi-attribute, not bundled items.

Hence, the two sets of results are not directly comparable. However, it is reasonable to pose the following question: why were such relatively poor prediction rates obtained in the Goldberg, Green, and Wind (1984) study?

These authors modeled part-worth utilities of the bundle items' prices with the implicit assumption that the total bundle price would therefore have no net effect on the total utility of a bundle offer. However, they found that "overall bundle price adds significantly to the accounted for variance in preference for ... bundles" (p. S129). Could the predictive ability of the authors' conjoint model be improved by explicitly modeling the effect of total bundle price? More generally, this question raises the conceptual issue of how non-price and price information is processed by buyers when they evaluate a bundle offer. In the discussion of future research directions in the concluding section of this chapter, answers to such questions will be explored.

Focal Criteria. The criteria are shown in Figure 31 under the column labeled "Substantive." An evaluation based on these criteria is now presented.

The problem formulation and goal statement of this research were clearly articulated in the Chapters I and II. After reviewing the economics literature on bundling, it was concluded that the study of individual buyer behavior in that substantive context had received inadequate research attention. The primary goal of this research, therefore, was to develop and test a conceptualization that focused on the evaluation of bundle offers by individual buyers.

Directing attention towards the study of individual buyer behavior in the context of bundle offers is relevant and important for several reasons. First, there is evidence that results based on existing analytical frameworks may be sensitive to the underlying assumptions about individual buyer behavior (e.g., Hanson and Martin 1987). Hence, a program of research that systematically examines individual buyer behavior is necessary. Second, macroeconomic analytical frameworks may be useful to provide insights about the market-level consequences of bundling (e.g., consumer welfare), but their ability to yield prescriptive guidelines for the management of bundling strategies is inadequate. The emphasis of this research was on developing a conceptualization that focused on the evaluation of bundle offers by individual buyers. Because of this theoretical focus, results of this research yielded only a few specific guidelines for managing bundling strategies. However, further explorations of the proposed conceptual models may provide a basis for developing a comprehensive set of guidelines for the management of bundling strategies. Further theoretical study of individual buyer behavior, with an emphasis on providing prescriptive guidelines for managerial use, is therefore needed.

Consequent Criteria. Interest in the findings of this research should be high because there is increasing recognition of the importance of bundling strategies. A recent article by Gultinan (1987) provided many examples of how bundling strategies are being used by marketers--especially in the area of services. The Marketing Science Institute has identified research on bundling as a priority area for the year 1989-90 and is known to have

funded at least one study on this topic (Gaeth and Levin 1987). This suggests that there is an increasing need for research on bundling from a marketing perspective, in contrast to the analytical approaches of the economics literature. Hence, this research should appeal to a large constituency of academics and practitioners.

This research is significant in that it directs attention to the study of individual buyer behavior in the substantive context of bundling, an area that has received inadequate research attention. Furthermore, two conceptual models were developed and tested that focused on the evaluation of bundles by buyers. The potential contribution of this research will, however, depend upon its ability to generate more research interest in this area. If the conceptualization proposed in this research is found useful by researchers and can provide an agenda of unexplored issues in the area of bundling, the potential contribution can be substantial.

Conceptual Domain

The criteria used to evaluate the conceptual domain are shown in the middle column of Figure 31. The discussion is organized around the antecedent criteria, followed by the focal criteria.

Antecedent Criteria. This research is based on the premise that the study of individual buyer behavior in the context of bundle offers is important but has received inadequate research attention. This premise rests on an exhaustive review of the literature on bundling. As documented in the

conceptual development, most of the literature on bundling has originated in the economics literature. With its emphasis on the market level consequences of bundling (such as consumer welfare), this body of literature pays inadequate attention to the study of individual buyer behavior. Additionally, this body of literature yields few specific insights about the management of bundling strategies in the market place (e.g., pricing of bundles).

How consistent is the conceptualization proposed in this research with other theoretical accounts? At this point, there is only one alternative conceptualization (Gaeth and Levin 1987) with which a comparison can be made. Gaeth and Levin have proposed that buyers form overall evaluations of a bundle of items by integrating evaluations of the individual items. Their conceptualization is based on Anderson's (1981) information integration theory, while the conceptualization proposed in this research is based on the anchoring and adjustment process.

However, as Lopes (1982) has noted, information integration theory and the anchoring and adjustment process are not conflicting theories. Instead, anchoring and adjustment is the process description of how multiple pieces of information are integrated by decision makers to form an overall evaluation. The algebraic representation of this process, as Lopes points out, yields the linear algebraic relationships frequently encountered in empirical tests of the information integration theory. Hence, it can be concluded that the conceptualization proposed in this research is consistent with that of Gaeth and Levin (1987).

Focal Criteria. The two pertinent criteria in this context are: theoretical logic and objectivity. Theoretical logic refers to the overall soundness of arguments on which a proposed conceptualization is based. Objectivity is reflected in the explicit attempts made in a research to propose and test alternative explanations.

Two fundamental arguments were made in the conceptual development of this research: 1) that buyers form an overall evaluation of a bundle of items by using an anchoring and adjustment process, and 2) that the perception of savings in a bundle offer is influenced by a) perception of savings offered on the items and b) perception of additional savings offered on the bundle. Regarding the evaluative criteria mentioned above, the theoretical logic and the objectivity of these arguments needs to be assessed.

Several studies conducted in the information integration theory paradigm suggested that overall evaluations based on several pieces of information tend to be averages of the individual evaluations. In addition, Lopes (1982) has argued that anchoring and adjustment is an appropriate process that is compatible with the averaging results so frequently encountered in empirical investigations of the information integration theory. Because overall evaluation of a bundle of items is based on evaluations of the individual items, the anchoring and adjustment process was proposed as a plausible theoretical account.

The conceptual model of transaction value, which posits that perceptions of overall savings will be influenced by two other perceptions, was guided by two observations. First, it was noted that sellers typically

wish to enhance the sales of both individual items and bundle of items. Hence, in many bundling situations, savings are offered on the individual items and the bundle. Second, because buyers prefer to segregate gains (Thaler 1985), it was argued that perceptions of overall savings in a bundle offer will be influenced by these two perceptions.

How objective are these theoretical arguments? In the abstract, the notion of objectivity can be said to encompass many factors such as a researcher's paradigm, analytical procedures employed, and even the researcher himself or herself. Conceretely, however, one way to assess the objectivity of a proposed theoretical argument could be to determine the number of alternative explanations that were developed and tested in a research effort--the development of alternative explanations would indicate that the proposed conceptualizations were pursued with objectivity.

In the model of transaction value (which focused on the perceptions savings), three alternative hypotheses were proposed and tested using analysis of variance and multiple comparisons. Four alternative model forms were also tested using the LISREL causal modeling methodology. The development and testing of these alternative explanations suggests that the proposed model of transaction value was pursued with objectivity.

In contrast, no alternative explanations were developed to compete directly with the proposed anchoring and adjustment hypothesis. However, the weighted-average hypothesis was tested by comparing alternative forms of linear regression models. It can be concluded, therefore, that the objectivity with which the anchoring and adjustment hypothesis was pursued could have been better.

Methodological Domain

The discussion in this section pertains to the focal criteria (see Figure 31 under the methodological column). In the two empirical studies reported in this research, undergraduate students were used as subjects. Criticisms directed at the use of student samples (e.g., Ferber 1977) were acknowledged when design issues of the two experiments were discussed. However, it was also noted that student subjects (if carefully chosen) provide homogeneous samples that can be appropriate for theory application (Calder, Phillips, and Tybout 1983). The primary emphasis of this research being on theory application, the use of students was not considered problematic.

Critique of Experiment 1

Construct Validity. In experiment 1, the primary variables of interest were perceived quality and perceived importance. These variables were operationalized using multiple items and the guidelines suggested by Churchill (1979). Construct validity was ascertained primarily by examining the reliability and the inter-item correlations of the constructs. The measures, fine tuned over several pretests, yielded satisfactory Cronbach's alphas and inter-item correlations in the final study.

Internal Validity. The anchor item and anchor evaluation play an important role in the proposed anchoring and adjustment process. Hence, the strategy adopted in this experiment was to manipulate the anchor item's description

and then test its influence on the overall bundle evaluation. Under the guise of testing a computerized version of Consumer Reports, strong manipulations of the anchor evaluation could be achieved--that is, both strongly positive and negative information about the anchor item could be provided to the subjects without making the scenarios unrealistic. Strong manipulations, by making the effects of experimental treatments more pronounced, improve the chances of statistically detecting those effects. In other words, strong manipulations enhance statistical conclusion validity. In addition, manipulation checks of the experimental factor anchor context could be obtained quite easily by ascertaining that the anchor evaluations were different. An effective verification of the manipulation reduces the number of alternative explanations and hence increases internal validity.

The use of computers for data collection made it possible to record unobtrusive measures that provided additional evidence about the process (specifically, order of information acquisition). This process-related evidence, when used in conjunction with the data on overall evaluations, provided further proof supporting the hypothesized anchoring and adjustment process. It should be recognized, however, that the process measures provided by the Ci2 software are quite rudimentary. These process measures may adequately serve the immediate needs of this research effort, but they remain deficient in the details of the underlying process (e.g., attribute level processing). This lack of process detail limits the experiment's ability to detect processes that may not be based on the hypothesized anchoring and adjustment process. Additionally, it can even be argued

that the software, by permitting the examination of bundle items only one at a time, imposes a sequential evaluation process on the subjects. Only subsequent investigations can fully address these concerns.

External Validity. In this study, subjects examined descriptions of items in a bundle and formed overall evaluations. The software used in this study permitted subjects to examine the bundle items in any order of their choice. However, items could be examined only one at a time. In the market place, the evaluative context is usually different from the experimental scenarios. This difference, along with the fact that no price information was presented in the experiment, suggests that claims of external validity cannot be made at this stage.

Critique of Experiment 2

Construct Validity. Six constructs pertaining to the model of transaction value were operationalized in experiment 2. In this experiment there was evidence (Cronbach's alpha, inter-item correlations) that the operationalizations effectively tapped the latent constructs. Reliability of the constructs pertaining to perceived sacrifice, however, was relatively low (about 0.75). Further evidence about the quality of the operationalizations came from statistics provided by the LISREL program during tests of the proposed conceptual model. Specifically, squared multiple correlations and coefficients of determination were found to be high, suggesting that a large proportion of variation in the latent constructs was accounted for by the indicator variables. Finally, relation-

ships between the constructs were as hypothesized, indicating good nomological validity.

Internal Validity. The discussion here pertains specifically to manipulations checks. Perdue and Summers (1986) have suggested that, to minimize the contamination of the dependent measures, it is preferable to conduct the manipulation checks outside of the main experiment (e.g., in pretests). If manipulation checks do have to be made during the main experiment, they recommend that measurement of dependent variables should always precede the manipulation checks.

The situation presented by this experiment was special in the sense that manipulations checks (of perceived savings on the items, and perceived additional savings on the bundle) were also dependent variables of interest. Hence, it was necessary to include the manipulation checks in the main experiment. As suggested by Perdue and Summers (1986), the manipulation checks were conducted after the dependent measures pertaining to the bundle offer (total transaction value and bundle's sacrifice) had been obtained. This strategy ensured that manipulation checks would not contaminate the other dependent measures.

However, as Perdue and Summers point out, this arrangement can potentially lead to the contamination of manipulation checks by other dependent measures. The inability to properly assess manipulation checks can lead to reduced internal validity. This investigation is characterized by this weakness. However, as analyses of the manipulation checks indicated, there is sufficient evidence that the manipulation worked as intended.

External Validity. This experiment was designed to investigate the effect of alternative price formats on the perception of savings in a bundle offer. One of the design objectives of this experiment (besides internal validity) was to create bundling scenarios which represented a wide range of pricing tactics that sellers typically use. The two factors manipulated in this experiment are in fact the two decisions that sellers frequently have to make: price reductions on the individual bundle items and on the bundle offers.

Manipulating these variables provided evaluation scenarios that bear at least a reasonable degree of resemblance to the types of bundle offers buyers normally see in the market place. By trying to increase the correspondence between the experimental stimuli and the real-world bundling situations, an attempt was made to increase the external validity of the results.

However, as discussed later in the section on future research directions, price information in a bundle offer can be presented to buyers in several alternative ways. Strictly speaking, results of this research pertain only to the specific presentation method employed in this investigation. In that respect, the external validity of this research is limited and can be established only by subsequent investigations. As Brinberg and McGrath (1985) have noted, external validity of a finding cannot be ascertained in the context of a single investigation; it can be established only on the basis of a series of studies that systematically vary different influences (e.g., subjects, setting, measures, methods) that can potentially affect the results.

DIRECTIONS FOR FUTURE RESEARCH

Two conceptual models were developed and tested in this research. The first model focused on the formation of acquisition value, while the second model sought to explain how perceptions of savings (transaction value) were formed in the context of bundle offers. In this section, several directions for future research are identified. The discussion is organized separately for the two models.

Model of Bundle's Acquisition Value

This model focuses on the role of both non-price and price information (see Figure 11). However, in the empirical investigation of this model, only the processing of non-price information was examined. Specifically, the focus of the empirical investigation (experiment 1) was on the hypothesized anchoring and adjustment process. A discussion of how this model can be further explored, both empirically and conceptually, is now presented.

The Role of Non-price and Price Information

Results of experiment 1 indicate that buyers form an overall evaluation of a bundle using an anchoring and adjustment process. Future research can approach this model from two different perspectives.

First, an empirical investigation of the untested relationships may yield further insights about the validity of the model. In experiment 1, only the anchoring and adjustment process was tested. Empirical investigations may be devised in which both price and non-price information are manipulated to study their joint effects. Traditional experimental designs, in conjunction with causal modeling, can be used to study the hypothesized relationships.

More generally, research is needed to understand at what stage in the evaluation process is the non-price and price information examined and evaluated. Is the price information examined first, or is it the non-price information? If prices of a bundle's items are provided along with the bundle price, how is the evaluation process affected? Can a general anchoring and adjustment process be proposed which focuses on the processing of both price and non-price information? Protocols, along with computer software that can provide unobtrusive measures of the evaluation process, can be useful methodological tools for the investigation of these issues. Such investigations may help explain Goldberg, Green, and Wind's (1984) relatively unsuccessful attempt to "predict a respondent's evaluation of a bundle... as a simple function of summed part-worths of the entities making up the bundle" (p. S114).

Influence of the Anchor

Two types of influences of the anchor item were identified in the conceptual development. First, a consequence of the anchoring and ad-

justment process is that the overall evaluation of a bundle tends to be biased towards the anchor's evaluation. Second, evaluation of the anchor was hypothesized to affect the evaluation of other items in the bundle. The design of experiment 1 was such that a satisfactory examination of these issues was not possible.

In this research, the anchor's biasing influence on the overall evaluation could not be investigated because perceived importance of the items was confounded with the order of information acquisition; important items tended to be examined first. To isolate the effects of order, experiments could be designed in which the perceived importance of the items was manipulated to be the same. Then, by changing the order of presentation across subjects, the biasing effect of order could be tested.

The hypothesis that the anchor's evaluation influences evaluations of other bundle items was not supported. The direction of the results, however, was as hypothesized. Two types of influences were identified in the conceptual development: 1) a contrast effect and 2) an assimilation effect. The contrast effect was hypothesized to increase the perceived difference between the two evaluations; the perceived difference was hypothesized to decrease due to the assimilation effect. One reason why this hypothesis was not supported in this research could be the use of descriptions that made a liberal use of words such as "excellent" and "poor" to make the descriptions less ambiguous. Future investigations of this issue need to make the descriptions less obvious and allow more room for interpretation of the descriptions.

Bundle Characteristics

How is the evaluation process affected when bundles with a large number of items are evaluated (e.g., a complex industrial system with many items being offered as a bundle)? In this research, subjects were permitted by the software to examine an item more than once if they so desired. However, very few subjects actually chose to examine an item more than once. One reason could be that there were only a few items in each bundle, and a single examination of the items was sufficient. Would items be examined more than once if the number of items was increased? Theoretically, the anchoring and adjustment process predicts that such recycling (i.e., looking at items more than once) could occur. Because bundles with a large number of items are frequently encountered in the marketplace, further examination of this issue is also important from a substantive perspective.

In this research, there was a clearly defined anchor item in that the perceived importance of one item was much larger than that of other items in each bundle. This type of manipulation provided the opportunity to test the hypothesis that bundle items would be examined in the decreasing order of perceived importance. Theoretically, the anchoring and adjustment process suggests that items perceived to be undifferentiated (i.e., equal in importance) would be examined in the order in which they are presented.

Model of Bundle's Transaction Value

This model (see Figure 12) proposes that the perception of overall savings in a bundle offer are positively influenced by 1) perceived savings offered on the items (items' transaction value) and 2) perceived additional savings offered on the bundle (bundling transaction value). Antecedents of the constructs items' transaction value and bundling transaction value, and relationships between the constructs, were developed in the model. It was also argued that the effect of bundling transaction value would be greater than that of items' transaction value. Experiment 2, which tested this model, found good support for the hypothesized relationships. In this section, four directions for future research efforts in the context of this conceptual model are described.

Process Details

In the model proposed in this research, the perception of overall savings in a bundle offer was hypothesized to be positively influenced by items' transaction value and bundling transaction value. However, no attempt was made to explain how buyers cognitively combine these two perceptions to form an overall perception of savings. That is, what is the process that buyers use to form the perception of overall savings? Answers about process questions of this nature can provide further insights into the focal phenomenon--namely, how perceptions of overall savings are formed.

One of the hypotheses developed in the conceptualization was that the effect (on perception of overall savings) of bundling transaction value would be greater than that of items' transaction value. As one plausible theoretical account, it can be argued that buyers combine these two perception of savings using an anchoring and adjustment process--focusing first on the more salient perceived saving (bundling transaction value) and then adjusting (based on items' transaction value) to form the perception of overall savings. Factors such as 1) method of presenting price information, and 2) prior purchase plans of buyers could potentially influence how this process actually operates. These arguments, though intuitively appealing, will have to wait formal testing in future research efforts.

Interaction Effects

No hypotheses were proposed that focused on the interaction effects of items' transaction value and bundling transaction value. Results of the empirical investigation, however, revealed an interaction between these two perceptions (effect size $f = 0.19$). Further examination of the interaction effects suggested that the effect (on total transaction value) of increasing additional savings offered on the bundle was different in the 1) presence and 2) absence of savings offered on the items. Why does this interaction effect occur? Why does the presence or absence of savings offered on the items alter the effect of additional savings offered on the bundle? Answers to these questions may be explored in fu-

ture investigations by focusing on the process buyers use to cognitively combine the various savings presented in a bundle offer.

Alternative Presentations of Price Information

In this research, a perception of savings was created on both the items and the bundle. This perception of savings was created by providing the following pieces of price information: 1) regular prices of the items, 2) sale prices of the items, and 3) the bundle price. However, this is only one of many alternative ways in which a perception of savings can be communicated to buyers. Do perceptions of savings change when the identical magnitudes of savings are presented differently? Results of this research suggest that perceptions of savings may change. From a managerial perspective, it may be useful to explore which presentation method (or methods) leads to higher perception of savings.

Effect of Alternative Purchase Plans

Consider a mixed-bundling situation where a bundle with two items (A and B) is offered for sale--that is, buyers have the option of buying the items individually or as a bundle. Theoretically, this bundle offer could be approached by buyers with three types of initial purchase plans: 1) those wishing to purchase only A, 2) those wishing to purchase only B, 3) those wishing to purchase both A and B, and 4) those wishing to purchase neither A nor B. It is possible that these different types of

buyers may frame the savings offered on the bundle differently. For example, buyers who approach the bundle offer with the initial intent to purchase both A and B may not examine the prices of the individual items; instead, only the bundle price may be examined. In contrast, buyers with an initial intent to purchase only A may frame the bundle offer as the additional amount of money (over and above the price of A) they will have to pay. More generally, this suggests that the purchase plans buyers have prior to evaluating a bundle offer, may affect their perceptions of the bundle offer. Given the managerial significance of this issue (Guiltinan 1987), it needs further examination.

CHAPTER SUMMARY

This chapter began with a presentation of the unexplored issues that motivated the research reported in this dissertation. It was noted that research on bundling has originated primarily in the economics literature and is characterized by several shortcomings. Inadequate attention to the study of individual buyer behavior in the context of bundle offers was identified as the primary weakness of this body of literature. Starting from the premise that more research was needed to understand how buyers evaluate bundle offers, two conceptual models were developed and tested in this research. These models, and results of their empirical tests, were briefly described in this chapter.

Using the framework suggested by Ozanne, Fern, and Yadav (1989), the substantive, conceptual, and methodological domains of this research were

then evaluated. Substantively, the problems addressed by this research were found to important and likely to be of interest to a large constituency in the marketing discipline. From a conceptual perspective, the development of two models (of acquisition and transaction value) in this research is important because it directs attention to an important question and provides an agenda for future research on bundling. The methodology of the two empirical investigations was also critiqued.

Finally, several directions for future research on bundling were identified. Regarding the model of acquisition value, exploration of the joint role of price and non-price information was identified as an important area for future research. Additionally, further study of the anchoring and adjustment process was urged. Suggestions were also offered to guide future research on the model of transaction value. One area identified for future research is based on the proposition that perceived savings offered on the items and the perceived additional savings offered on the bundle may be cognitively combined by subjects using an anchoring and adjustment process. Attention was also directed at the interaction effects of these two perceptions of savings. The effects of purchase plans prior to evaluating a bundle offer, and alternative presentations of price information, were also identified as research areas that deserve attention in future investigations.

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APPENDICES

APPENDIX A

PRETEST 1 INSTRUMENT

Survey of Virginia Tech Students

As part of a market research study, we are interested in the opinions of students such as yourself regarding some products. While completing this questionnaire, remember that there are no right or wrong answers. In fact, different individuals are likely to answer the same questions differently.

By completing this questionnaire, you qualify automatically to be the possible winner of a \$100 cash prize. The winner's name will be posted on the Marketing Department's Bulletin Board (outside Pamplin 2016) on April 16, 1990.

If you have any questions while completing this questionnaire, please raise your hand. Thank you for your time and cooperation.

Now please turn to the next page.

Section 1

In this section, we are interested in your impressions as a consumer about this **Photography Kit** consisting of the following products:

- TRIPOD STAND
- ZOOM LENS
- 35 mm CAMERA

Please answer questions 1-9. For each question, circle the number (between 1 and 7) that best describes your impressions about these three products.

I. In my general activities, products in this Photography Kit:

- | | | | | | | | | |
|---|---|---|---|---|---|---|---|-------------------------|
| Q.1) Are unimportant to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are important to me |
| Q.2) Are of no concern to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are of concern to me |
| Q.3) Are irrelevant to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are relevant to me |
| Q.4) Are meaningless to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are meaningful to me |
| Q.5) Do not matter to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Do matter to me |
| Q.6) How knowledgeable are you about these products? | | | | | | | | |
| Not Knowledgeable at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely Knowledgeable |
| Q.7) How familiar are you with these products? | | | | | | | | |
| Not Familiar at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely Familiar |
| Q.8) What is your experience using these products? | | | | | | | | |
| Have never used them | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Use them often |
| Q.9) Do you know which characteristics of these products are important for making a wise purchase decision? | | | | | | | | |
| Know nothing | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Know a lot |

II. Assume you were interested in purchasing this Photography Kit consisting of the three products given above. Now please answer questions 10 and 11.

Q.10) In the space below, distribute 100 points between these three products to indicate the **relative importance** to you of each product in this **Photography Kit**. The greater the relative importance of a product, the more points it should receive.

	PRODUCTS	WRITE POINTS HERE
a)	Tripod Stand	_____ Points
b)	Zoom Lens	_____ Points
c)	35mm Camera	_____ Points
		Total = 100 Points

Q.11) In the space below, write your estimate of the **average retail price** of these three products.

	PRODUCTS	WRITE PRICE HERE
a)	Tripod Stand	\$ _____
b)	Zoom Lens	\$ _____
c)	35mm Camera	\$ _____

(Over)

Section 2

In this section, we are interested in your impressions as a consumer about this **Computer System** consisting of the following products:

- SOFTWARE (word processing)
- COMPUTER (with monitor)
- DOT MATRIX PRINTER

Please answer questions 1-9. For each question, circle the number (between 1 and 7) that best describes your impressions about these three products in general.

I. In my general activities, products in this Computer System:

- Q.1) Are unimportant to me 1 2 3 4 5 6 7 Are important to me
- Q.2) Are of no concern to me 1 2 3 4 5 6 7 Are of concern to me
- Q.3) Are irrelevant to me 1 2 3 4 5 6 7 Are relevant to me
- Q.4) Are meaningless to me 1 2 3 4 5 6 7 Are meaningful to me
- Q.5) Don't matter to me 1 2 3 4 5 6 7 Do matter to me
- Q.6) How knowledgeable are you about these products?
- Not Knowledgeable at all 1 2 3 4 5 6 7 Extremely Knowledgeable
- Q.7) How familiar are you with these products?
- Not Familiar at all 1 2 3 4 5 6 7 Extremely Familiar
- Q.8) What is your experience using these products?
- Have never used them 1 2 3 4 5 6 7 Use them often
- Q.9) Do you know which characteristics of these products are important for making a wise purchase decision?
- Know nothing 1 2 3 4 5 6 7 Know a lot

II. Assume you were interested in purchasing this Computer System consisting of the three products given above. Now please answer questions 10 and 11.

Q.10) In the space below, distribute 100 points between these three products to indicate the **relative importance** to you of each product in this **Computer System**. The greater the relative importance of a product, the more points it should receive.

	PRODUCTS	WRITE POINTS HERE
a)	Software (word processing)	_____ Points
b)	Computer (with monitor)	_____ Points
c)	Dot Matrix Printer	_____ Points
		Total = 100 Points

Q.11) In the space below, write your estimate of the **average retail price** of these three products.

	PRODUCTS	WRITE PRICE HERE
a)	Software (word processing)	\$ _____
b)	Computer (with monitor)	\$ _____
c)	Dot Matrix Printer	\$ _____

(Over)

Section 3

In this section, we are interested in your impressions as a consumer about this **Luggage Set** consisting of the following products:

- CARRYON
- TOTE
- PULLMAN

Please answer questions 1-9. For each question, circle the number (between 1 and 7) that best describes your impressions about these three products in general.

I. In my general activities, products in this Luggage Set:

- | | | | | | | | | |
|---|---|---|---|---|---|---|---|-------------------------|
| Q.1) Are unimportant to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are important to me |
| Q.2) Are of no concern to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are of concern to me |
| Q.3) Are irrelevant to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are relevant to me |
| Q.4) Are meaningless to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are meaningful to me |
| Q.5) Don't matter to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Do matter to me |
| Q.6) How knowledgeable are you about these products? | | | | | | | | |
| Not Knowledgeable at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely Knowledgeable |
| Q.7) How familiar are you with these products? | | | | | | | | |
| Not Familiar at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely Familiar |
| Q.8) What is your experience using these products? | | | | | | | | |
| Have never used them | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Use them often |
| Q.9) Do you know which characteristics of these products are important for making a wise purchase decision? | | | | | | | | |
| Know nothing | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Know a lot |

II. Assume you were interested in purchasing this Luggage Set consisting of the three products given above. Now please answer questions 10 and 11.

Q.10) In the space below, distribute 100 points between these three products to indicate the **relative importance** to you of each product in this **Luggage Set**. The greater the relative importance of a product, the more points it should receive.

	PRODUCTS	WRITE POINTS HERE
a)	Carryon	_____ Points
b)	Tote	_____ Points
c)	Pullman	_____ Points
		Total = 100 Points

Q.11) In the space below, write your estimate of the **average retail price** of these three products.

	PRODUCTS	WRITE PRICE HERE
a)	Carryon	\$ _____
b)	Tote	\$ _____
c)	Pullman	\$ _____

(Over)

Section 4

In this section, we are interested in your Impressions as a consumer about this **Livingroom Furniture Set** consisting of the following products:

- LOVESEAT
- SOFA
- COFFEE TABLE

Please answer questions 1-9. For each question, circle the number (between 1 and 7) that best describes your impressions about these three products in general.

I. In my general activities, products in this Furniture Set:

- Q.1) Are unimportant to me 1 2 3 4 5 6 7 Are important to me
- Q.2) Are of no concern to me 1 2 3 4 5 6 7 Are of concern to me
- Q.3) Are irrelevant to me 1 2 3 4 5 6 7 Are relevant to me
- Q.4) Are meaningless to me 1 2 3 4 5 6 7 Are meaningful to me
- Q.5) Don't matter to me 1 2 3 4 5 6 7 Do matter to me
- Q.6) How knowledgeable are you about these products?
 Not Knowledgeable at all 1 2 3 4 5 6 7 Extremely Knowledgeable
- Q.7) How familiar are you with these products?
 Not Familiar at all 1 2 3 4 5 6 7 Extremely Familiar
- Q.8) What is your experience using these products?
 Have never used them 1 2 3 4 5 6 7 Use them often
- Q.9) Do you know which characteristics of these products are important for making a wise purchase decision?
 Know nothing 1 2 3 4 5 6 7 Know a lot

III. Assume you were interested in purchasing this Furniture Set consisting of the three products given above. Now please answer questions 10 and 11.

Q.10) In the space below, distribute 100 points between these three products to indicate the **relative importance** to you of each product in this **Furniture Set**. The greater the relative importance of a product, the more points it should receive.

	PRODUCTS	WRITE POINTS HERE
a)	Loveseat	_____ Points
b)	Sofa	_____ Points
c)	Coffee Table	_____ Points
		Total = 100 Points

Q.11) In the space below, write your estimate of the **average retail price** of these three products.

	PRODUCTS	WRITE PRICE HERE
a)	Loveseat	\$ _____
b)	Sofa	\$ _____
c)	Coffee Table	\$ _____

(Over)

Section 5

In this section, we are interested in your impressions as a consumer about this **Fall/Winter Ensemble** consisting of the following products:

- LEATHER JACKET
- SHIRT
- SWEATER

Please answer questions 1-9. For each question, circle the number (between 1 and 7) that best describes your impressions about these three products in general.

I. In my general activities, products in this Ensemble:

- Q.1) Are unimportant to me 1 2 3 4 5 6 7 Are important to me
- Q.2) Are of no concern to me 1 2 3 4 5 6 7 Are of concern to me
- Q.3) Are irrelevant to me 1 2 3 4 5 6 7 Are relevant to me
- Q.4) Are meaningless to me 1 2 3 4 5 6 7 Are meaningful to me
- Q.5) Don't matter to me 1 2 3 4 5 6 7 Do matter to me
- Q.6) How knowledgeable are you about these products?
 Not Knowledgeable at all 1 2 3 4 5 6 7 Extremely Knowledgeable
- Q.7) How familiar are you with these products?
 Not Familiar at all 1 2 3 4 5 6 7 Extremely Familiar
- Q.8) What is your experience using these products?
 Have never used them 1 2 3 4 5 6 7 Use them often
- Q.9) Do you know which characteristics of these products are Important for making a wise purchase decision?
 Know nothing 1 2 3 4 5 6 7 Know a lot

III. Assume you were interested in purchasing this Ensemble consisting of the three products given above. Now please answer questions 10 and 11.

Q.10) In the space below, distribute 100 points between these three products to indicate the **relative importance** to you of each product in this **Ensemble**. The greater the relative importance of a product, the more points it should receive.

	PRODUCTS	WRITE POINTS HERE
a)	Leather Jacket	_____ Points
b)	Shirt	_____ Points
c)	Sweater	_____ Points
		Total = 100 Points

Q.11) In the space below, write your estimate of the **average retail price** of these three products.

	PRODUCTS	WRITE PRICE HERE
a)	Leather Jacket	\$ _____
b)	Shirt	\$ _____
c)	Sweater	\$ _____

(Over)

Section 6

In this section, we are interested in your impressions as a consumer about this **Bedroom Furniture Set** consisting of the following products:

- BED
- 5-DRAWER CHEST
- NIGHTSTAND

Please answer questions 1-9. For each question, circle the number (between 1 and 7) that best describes your impressions about these three products in general.

I. In my general activities, products in this Furniture Set:

- | | | | | | | | | |
|---|---|---|---|---|---|---|---|-------------------------|
| Q.1) Are unimportant to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are important to me |
| Q.2) Are of no concern to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are of concern to me |
| Q.3) Are irrelevant to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are relevant to me |
| Q.4) Are meaningless to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Are meaningful to me |
| Q.5) Don't matter to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Do matter to me |
| Q.6) How knowledgeable are you about these products? | | | | | | | | |
| Not Knowledgeable at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely Knowledgeable |
| Q.7) How familiar are you with these products? | | | | | | | | |
| Not Familiar at all | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely Familiar |
| Q.8) What is your experience using these products? | | | | | | | | |
| Have never used them | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Use them often |
| Q.9) Do you know which characteristics of these products are important for making a wise purchase decision? | | | | | | | | |
| Know nothing | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Know a lot |

III. Assume you were interested in purchasing this Furniture Set consisting of the three products given above. Now please answer questions 10 and 11.

Q.10) In the space below, distribute 100 points between these three products to indicate the **relative importance** to you of each product in this **Furniture Set**. The greater the relative importance of a product, the more points it should receive.

	PRODUCTS	WRITE POINTS HERE
a)	Bed	_____ Points
b)	5-Drawer Chest	_____ Points
c)	Night Stand	_____ Points
		Total = 100 Points

Q.11) In the space below, write your estimate of the **average retail price** of these three products.

	PRODUCTS	WRITE PRICE HERE
a)	Bed	\$ _____
b)	5-Drawer Chest	\$ _____
c)	Nightstand	\$ _____

(Over)

Section 7

1. Your sex:

2. Your age:

3. Your major:

4. To enter your name for the \$100 cash prize, please provide the following information:

a) Name (print clearly):

b) Telephone #:

Thank You

APPENDIX B

PRETEST 2 INSTRUMENT

Survey of Virginia Tech Students

Instructions

As part of a market research study, we are interested in the opinions of students such as yourself regarding some products. In the questionnaire that follows, you will be shown descriptions of some products and then asked some questions about those products. The descriptions have been taken from **Consumer Reports**, a reputable publication that regularly tests and reports about a variety of consumer products. While completing this questionnaire, remember that there are no right or wrong answers. In fact, different individuals are likely to answer the same questions differently.

By completing this questionnaire, you qualify automatically to be the possible winner of a \$100 cash prize. If you also participated in Survey #1 a few weeks ago, completing this questionnaire improves your chance of winning the \$100 prize. The winner's name will be posted on the Marketing Department's Bulletin Board (outside Pamplin 2016) on April 16, 1990.

If you have any questions while completing this questionnaire, please raise your hand. Thank you for your time and cooperation.

Now please turn to the next page.

Section 1

In this section, we are interested in your impressions as a consumer about this **Computer System** consisting of the following products:

- DESKTOP PRINTER STAND
- PERSONAL COMPUTER (with monitor)
- DOT MATRIX PRINTER

1) Assume you were asked to judge the **overall quality** of this computer system consisting of the three products given above. Below, distribute 100 points between these three products to **indicate the relative importance to you of each product's quality in judging the overall quality of this computer system**. The greater the relative importance of a product's quality, the more points it should receive.

PRODUCTS	WRITE POINTS HERE
a) Desktop Printer Stand	_____ Points
b) Personal Computer (with monitor)	_____ Points
c) Dot Matrix Printer	_____ Points
	Total = 100 Points

2) In the space below, write your estimate of the **average retail price** of these three products.

PRODUCTS	WRITE PRICE HERE
a) Desktop Printer Stand	\$ _____
b) Personal Computer (with monitor)	\$ _____
c) Dot Matrix Printer	\$ _____

Section 2

In this section, we are interested in your impressions as a consumer about this **Bedroom Package** consisting of the following products:

- | |
|---|
| •5-DRAWER CHEST
•NIGHT STAND
•BED |
|---|

1) Assume you were asked to judge the **overall quality** of this bedroom package consisting of the three products given above. Below, distribute 100 points between these three products to indicate the **relative importance to you of each product's quality in judging the overall quality of this bedroom package**. The greater the relative importance of a product's quality, the more points it should receive.

	PRODUCTS	WRITE POINTS HERE
a)	5-Drawer Chest	_____ Points
b)	Night Stand	_____ Points
c)	Bed	_____ Points
		Total = 100 Points

2) In the space below, write your estimate of the **average retail price** of these three products.

	PRODUCTS	WRITE PRICE HERE
a)	5-Drawer Chest	\$ _____
b)	Night Stand	\$ _____
c)	Bed	\$ _____

Section 3

In this section, we are interested in your impressions as a consumer about the product that is described below. Please read the description carefully and then answer the questions that follow.

5-DRAWER CHEST

This chest passed several quality checks in **Consumer Reports'** laboratory but also failed a few. Tests reveal that the quality of wood is very good and is finished adequately to retain a shine for a long duration. The chest's wood joints, critical to its durability, easily passed the quality checks.

Despite these merits, however, the tests also revealed a few quality flaws. Specifically, the chest's brass handles were found inadequately secured on several samples— a sign of poor attention to manufacturing detail. Another indication of sloppy manufacturing and less-than-best quality is that the chest drawers did not slide out smoothly.

Please answer questions 1-4. For each question, circle the number (between 1 and 7) that best describes your impressions about this product described above.

1) The likelihood that this product is durable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

2) The likelihood that this product is dependable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

3) If this product belonged to you, your experience with it is likely to be:

1	2	3	4	5	6	7
Very Dissatisfying	Moderately Dissatisfying	Slightly Dissatisfying	Neither Dissatisfying Nor Satisfying	Slightly Satisfying	Moderately Satisfying	Very Satisfying

4) The quality of this product appears to be:

1	2	3	4	5	6	7
Very Poor	Moderately Poor	Slightly Poor	Neither Poor Nor Good	Slightly Good	Moderately Good	Very Good

Section 4

In this section, we are interested in your impressions as a consumer about the product that is described below. Please read the description carefully and then answer the questions that follow.

PERSONAL COMPUTER (with monitor)

In laboratory tests at **Consumer Reports**, this computer's performance was exceptionally good and well above industry standards. The internal components and external features of the computer indicate the use of quality materials and very careful attention to manufacturing detail. While in operation, the computer's noise level is minimal and much less than what is usually considered normal. During tests, different types of software ran on this computer with remarkable speed. This speed suggests the use of state-of-the-art computer design. The computer monitor's screen displayed graphics and text with extremely good clarity that is above industry standards.

Please answer questions 1-4. For each question, circle the number (between 1 and 7) that best describes your impressions about this product described above.

1) The likelihood that this product is durable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

2) The likelihood that this product is dependable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

3) If this product belonged to you, your experience with it is likely to be:

1	2	3	4	5	6	7
Very Dissatisfying	Moderately Dissatisfying	Slightly Dissatisfying	Neither Dissatisfying Nor Satisfying	Slightly Satisfying	Moderately Satisfying	Very Satisfying

4) The quality of this product appears to be:

1	2	3	4	5	6	7
Very Poor	Moderately Poor	Slightly Poor	Neither Poor Nor Good	Slightly Good	Moderately Good	Very Good

Section 5

In this section, we are interested in your impressions as a consumer about the product that is described below. Please read the description carefully and then answer the questions that follow.

NIGHT STAND

This night stand is obviously well made, but does have a few quality shortcomings. Like any quality furniture piece, this night stand is made from quality wood that shines well and retains the shine with little maintenance. The two small drawers in the night stand are an added convenience and slide out smoothly.

Unlike quality night stands, however, this product's top surface area is rather small and does not have a protective coating against accidental spills. Additionally, this product's sturdiness is less than the industry standards for such products. Such shortcomings normally don't exist in quality night stands.

Please answer questions 1-4. For each question, circle the number (between 1 and 7) that best describes your impressions about this product described above.

1) The likelihood that this product is durable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

2) The likelihood that this product is dependable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

3) If this product belonged to you, your experience with it is likely to be:

1	2	3	4	5	6	7
Very Dissatisfying	Moderately Dissatisfying	Slightly Dissatisfying	Neither Dissatisfying Nor Satisfying	Slightly Satisfying	Moderately Satisfying	Very Satisfying

4) The quality of this product appears to be:

1	2	3	4	5	6	7
Very Poor	Moderately Poor	Slightly Poor	Neither Poor Nor Good	Slightly Good	Moderately Good	Very Good

Section 6

In this section, we are interested in your impressions as a consumer about the product that is described below. Please read the description carefully and then answer the questions that follow.

BED

This bed failed a large number of quality checks in **Consumer Reports'** product testing laboratory. The quality of wood is below industry standards and provides only marginally adequate strength to this bed. In addition, tests show that the wood shines only with great difficulty and does not retain the shine for long periods— a clear indication of poor quality materials and manufacturing. **Consumer Reports** also tested the strength of the bed's joints and found it to be only marginally adequate and below industry standards. Unlike other quality beds, this product does not have specially reinforced legs to provide greater support and durability.

Please answer questions 1-4. For each question, circle the number (between 1 and 7) that best describes your impressions about this product described above.

1) The likelihood that this product is durable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

2) The likelihood that this product is dependable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

3) If this product belonged to you, your experience with it is likely to be:

1	2	3	4	5	6	7
Very Dissatisfying	Moderately Dissatisfying	Slightly Dissatisfying	Neither Dissatisfying Nor Satisfying	Slightly Satisfying	Moderately Satisfying	Very Satisfying

4) The quality of this product appears to be:

1	2	3	4	5	6	7
Very Poor	Moderately Poor	Slightly Poor	Neither Poor Nor Good	Slightly Good	Moderately Good	Very Good

Section 7

In this section, we are interested in your impressions as a consumer about the product that is described below. Please read the description carefully and then answer the questions that follow.

DOT MATRIX PRINTER

This printer is well designed and manufactured, but also appears to suffer from a few defects. It prints different types of graphics and text with clarity that is good but less than the industry standards of the best printers. The operating noise level is low and the printer's design makes paper change very easy.

Although this product has several characteristics of quality printers, there is also evidence of some quality problems. Laboratory tests show that this printer consumes printing ribbon faster than normal. In endurance tests, the printer operated without mechanical problems but it had a tendency to overheat.

Please answer questions 1-4. For each question, circle the number (between 1 and 7) that best describes your impressions about this product described above.

1) The likelihood that this product is durable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

2) The likelihood that this product is dependable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

3) If this product belonged to you, your experience with it is likely to be:

1	2	3	4	5	6	7
Very Dissatisfying	Moderately Dissatisfying	Slightly Dissatisfying	Neither Dissatisfying Nor Satisfying	Slightly Satisfying	Moderately Satisfying	Very Satisfying

4) The quality of this product appears to be:

1	2	3	4	5	6	7
Very Poor	Moderately Poor	Slightly Poor	Neither Poor Nor Good	Slightly Good	Moderately Good	Very Good

Section 8

In this section, we are interested in your impressions as a consumer about the product that is described below. Please read the description carefully and then answer the questions that follow.

BED

This bed passed all quality checks in **Consumer Reports'** product testing laboratory— a truly remarkable accomplishment for any product. The quality of wood is above industry standards and provides adequate strength to this bed. In addition, tests show that the wood shines easily and retains the shine for long periods— a clear indication of quality materials and manufacturing. **Consumer Reports** also tested the strength of the bed's joints and found it to be exceptionally strong and above industry standards. Like other quality beds made with modern designs and manufacturing techniques, this bed has specially reinforced legs to provide greater support and durability.

Please answer questions 1-4. For each question, circle the number (between 1 and 7) that best describes your impressions about this product described above.

1) The likelihood that this product is durable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

2) The likelihood that this product is dependable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

3) If this product belonged to you, your experience with it is likely to be:

1	2	3	4	5	6	7
Very Dissatisfying	Moderately Dissatisfying	Slightly Dissatisfying	Neither Dissatisfying Nor Satisfying	Slightly Satisfying	Moderately Satisfying	Very Satisfying

4) The quality of this product appears to be:

1	2	3	4	5	6	7
Very Poor	Moderately Poor	Slightly Poor	Neither Poor Nor Good	Slightly Good	Moderately Good	Very Good

Section 9

In this section, we are interested in your impressions as a consumer about the product that is described below. Please read the description carefully and then answer the questions that follow.

DESKTOP PRINTER STAND

This product incorporates several features of other quality desktop printer stands, but laboratory tests at **Consumer Reports** also suggest a few quality problems. In the compact design of this printer stand, paper is fed from under the printer. The stand fits neatly on one's desk without occupying too much space. Like other quality printer stands, this product too is made of reinforced plastic.

Despite several attractive features in the stand's design, laboratory tests revealed some flaws. Specifically, the stand's legs are not sufficiently strong. Consequently, the stand's vibration exceeds industry standards and reduces printing quality. Additionally, space for paper storage under the printer is inadequate.

Please answer questions 1-4. For each question, circle the number (between 1 and 7) that best describes your impressions about this product described above.

1) The likelihood that this product is durable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

2) The likelihood that this product is dependable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

3) If this product belonged to you, your experience with it is likely to be:

1	2	3	4	5	6	7
Very Dissatisfying	Moderately Dissatisfying	Slightly Dissatisfying	Neither Dissatisfying Nor Satisfying	Slightly Satisfying	Moderately Satisfying	Very Satisfying

4) The quality of this product appears to be:

1	2	3	4	5	6	7
Very Poor	Moderately Poor	Slightly Poor	Neither Poor Nor Good	Slightly Good	Moderately Good	Very Good

Section 10

In this section, we are interested in your impressions as a consumer about the product that is described below. Please read the description carefully and then answer the questions that follow.

PERSONAL COMPUTER (with monitor)

In laboratory tests at **Consumer Reports**, this computer's performance was very poor and below industry standards. The internal components and external features of the computer indicate the use of many poor quality materials and inadequate attention to manufacturing detail. While in operation, the computer's noise level is a little excessive and marginally more than what is usually considered normal. During tests, different types of software ran on this computer with speeds that are less than that of typical quality computers on the market. The computer monitor's screen displayed graphics and text with acceptable clarity, but below industry standards.

Please answer questions 1-4. For each question, circle the number (between 1 and 7) that best describes your impressions about this product described above.

1) The likelihood that this product is durable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

2) The likelihood that this product is dependable is:

1	2	3	4	5	6	7
Very Low	Moderately Low	Slightly Low	Neither Low Nor High	Slightly High	Moderately High	Very High

3) If this product belonged to you, your experience with it is likely to be:

1	2	3	4	5	6	7
Very Dissatisfying	Moderately Dissatisfying	Slightly Dissatisfying	Neither Dissatisfying Nor Satisfying	Slightly Satisfying	Moderately Satisfying	Very Satisfying

4) The quality of this product appears to be:

1	2	3	4	5	6	7
Very Poor	Moderately Poor	Slightly Poor	Neither Poor Nor Good	Slightly Good	Moderately Good	Very Good

Section 11

1. Your sex:

2. Your age:

3. Your major:

4. To enter your name for the \$100 cash prize, please provide the following information:

a) Name (print clearly):

b) Telephone #:

Thank You

APPENDIX C

EXPERIMENT 1: DESCRIPTIONS OF COMPUTER BUNDLE ITEMS

A. PERSONAL COMPUTER (Excellent Manipulation)

In laboratory tests at Consumer Reports, this computer's performance was exceptionally good and substantially above industry standards. The internal components and external features of the computer indicate the use of extremely good quality materials and very careful attention to manufacturing detail. While in operation, the computer's noise level is almost negligible and certainly much less than what is usually considered normal. During tests, different types of software ran on the computer with remarkable speed. This speed suggests the use of state-of-the-art computer design. The computer's monitor screen displayed graphics with extremely good clarity that is substantially above industry standards.

B. PERSONAL COMPUTER (Poor Manipulation)

In laboratory tests at Consumer Reports, this computer's performance was extremely poor and substantially below industry standards. The internal components and external features of the computer indicate the use of many poor quality materials and very inadequate attention to manufacturing detail. While in operation, the computer's noise level is quite excessive and appreciably more than what is usually considered normal. During tests, different types of software ran on this computer with speeds that are much less than that of typical quality computers on the market. The computer's monitor screen displayed graphics and text with marginally acceptable clarity, but below industry standards.

C. DOT MATRIX PRINTER

This printer is well designed and manufactured, but also appears to have a few drawbacks. It prints different types of graphics and text with passable clarity--better than inferior printers, but not as well as the good ones. This printer's printing speed, a common index of printer quality, measured midway between that of the slowest and the fastest printers on the market. The operating noise level is average and the printer's design makes paper change reasonably easy. Laboratory tests show that this printer consumes printing ribbon faster than normal--but certainly not as fast as the poor-quality printers.

D. 3-SHELF PRINTER STAND

This product incorporates several features of other quality printer stands, but laboratory tests at Consumer Reports also suggest a few problems. Like most medium-quality printer stands with built-in shelves, this product is reasonably spacious and convenient--the printer sits on top with the three lower shelves meant for storing printing paper and computer supplies. The stand, manufactured from reinforced wood, is of average sturdiness. The stand provides reasonably adequate support to the printer, but could be stronger. Consequently, the stand's vibration level (which may reduce a printer's printing quality) is rated only marginally acceptable.

APPENDIX D

EXPERIMENT 1: DESCRIPTIONS OF BEDROOM BUNDLE ITEMS

A. COMPLETE QUEEN-SIZE BED (Excellent Manipulation)

This bed passed all tests in Consumer Reports' product testing laboratory--a truly remarkable accomplishment for any product. The quality of wood is above industry standards and provides adequate strength to this bed. In addition, tests show that the wood shines easily and retains the shine for long periods--a clear indication of superior quality materials and manufacturing technology. Consumer Reports also tested the strength of the bed joints and found it to be exceptionally strong and above industry standards. Like other quality beds made with modern designs and manufacturing techniques, this bed has specially reinforced legs to provide greater support and durability. Also, the bed's mattress and box spring easily passed all quality checks.

B. COMPLETE QUEEN-SIZE BED (Poor Manipulation)

This bed failed a large number of tests in Consumer Report's product testing laboratory. The quality of wood is below industry standards and provides only marginally adequate strength to this bed. In addition, tests show that the wood shines only with great difficulty and does not retain the shine for long periods--a clear indication of poor materials and manufacturing technology. Consumer Reports also tested the strength of the bed's joints and found it to be only marginally adequate and below industry standards. Unlike other quality beds, this product does not have specially reinforced legs to provide greater support and durability. Also, the bed's mattress and box spring failed several quality checks.

C. 5-DRAWER CHEST

This chest passed most tests in Consumer Reports' laboratory, but these tests were passed only marginally. Tests reveal that the chest's wood is of passable quality and takes on a reasonably adequate shine. The chest's wood joints, critical to its durability, are of medium strength. And the chest's wood thickness, a sign of product quality, is comparable to that of other average-strength chests presently available. Tests reveal that the brass handles on the chest are adequately secured but could be stronger. The chest drawers slide out only with moderate smoothness. The chest's sturdiness is rated fair. Hence, overall, this product's features are satisfactory but they need a considerable amount of improvement.

D. 2-DRAWER NIGHT STAND

This night stand is reasonably well constructed, but does have a few shortcomings. The wood marginally passed the strength tests. The two small drawers built in the night stand are an added convenience, but tests show that their sliding smoothness is only mediocre. The night stand's protective coating against wear and accidental spills is reasonably effective, but it could be improved. This protective coating, though needing improvement, is nevertheless better than the surface of inferior night stands that have no protective coating at all. Finally, this product's sturdiness measured approximately the same as the industry standards of typical medium-strength night stands.

APPENDIX E

PRETEST 5 INSTRUMENT

MARKET RESEARCH SURVEY

Instructions: Please examine the products shown on the next page and answer the following questions.

A. Questions about Product A (Garment Bag)

1. Do you currently own or have previously owned a product similar to the one described above?

YES NO

2. Please indicate the price you feel would be too high to pay for the product described above.

Price \$ _____

3. Please indicate the price that you feel would be too low for the product described above. That is, a price where you may begin to suspect the product's quality.

Price \$ _____

4. What price do you feel would be a normal or reasonable price for the product described above.

Price \$ _____

B. Questions about Product B (Pullman)

1. Do you currently own or have previously owned a product similar to the one described above?

YES NO

2. Please indicate the price you feel would be too high to pay for the product described above.

Price \$ _____

3. Please indicate the price that you feel would be too low for the product described above. That is, a price where you may begin to suspect the product's quality.

Price \$ _____

4. What price do you feel would be a normal or reasonable price for the product described above.

Price \$ _____

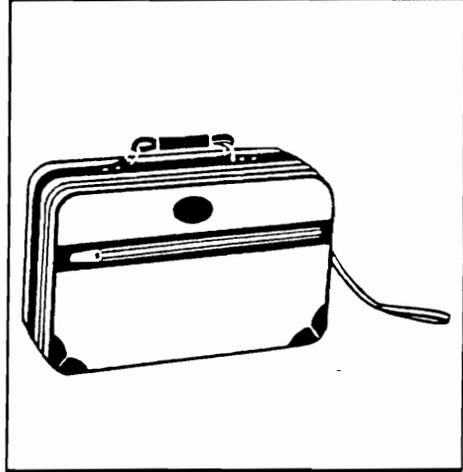
ADVERTISEMENT

Item A
(44" Garment Bag)



- Durable polyester material
- Unique hanger locking system
- Fully zippered for easy packing
- Fits in overhead storage

Item B
(27" Pullman)



- Durable polyester material
- Protective bottom "feet"
- Reinforced steel frame
- Large interior & outer pockets

Remove Advertisement Page for Ease of Reference

APPENDIX F

PRETEST 6 INSTRUMENT (CELL 3)

Survey of Virginia Tech Students

Instructions

As part of a market research study, we are interested in the reactions of consumers such as yourself regarding an advertisement for luggage items. In the questionnaire that follows, you will be shown the advertisement and then asked some questions based on your reading of the advertisement. While completing this questionnaire, please remember that there are no right or wrong answers. In fact, different individuals are likely to answer the same questions differently.

Please do not write your name anywhere on this questionnaire. Every effort will be made to preserve your anonymity, so you may answer all questions accurately and honestly.

If you have any questions while completing this questionnaire, please raise your hand. Thank you for your time and cooperation.

Now please turn to the next page

Section I

Before we show you the luggage advertisement, we wish to ask a few questions about your shopping habits. The following statements are about how you shop and the feelings you have about shopping. Please indicate the degree that you agree or disagree with each statement by circling that number (between 1 and 7) that best expresses your feeling.

1. I usually buy the lowest-priced brand available:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

2. Advertisements for sales are usually misleading:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

3. When shopping, I always compare prices before making my selection:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

4. Price is the most important factor to me when making price decisions:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

5. I consider myself a real "bargain hunter":

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

6. Lower-priced items usually do not give good value for money:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

Section II

Instructions. Imagine now that you are interested in purchasing the following two luggage items: 1) a Garment Bag and 2) a Pullman. Also, assume that you wish to have matching luggage items and would therefore prefer to purchase these two luggage items together as a set.

Assume that an advertisement featuring the type of luggage items you are looking for came to your attention. This advertisement is shown on the next page. **Read this advertisement as you would normally do as consumer interested in buying a matching 2-piece luggage set.** However, in this survey, we are interested in your reaction to the information contained in the advertisement, not on how well the advertisement is presented. Please note that this survey is NOT a test of your marketing or advertising knowledge.

Now please turn to the next page and carefully read the advertisement. For ease of reference, you should remove the advertisement page from your booklet before proceeding with the questionnaire.

Instructions. Based on your careful reading of the information contained in advertisement, please respond to each of the following statements below. For each statement, review the advertisement and circle that number (between 1 and 7) that best describes your opinion about that statement.

You may find several statements to be quite similar to each other. However, it is important that you examine and respond to each statement very carefully.

To respond to these statements, you will have to keep referring to the advertisement. For ease of reference, you should now remove the advertisement page from your booklet if you haven't already.

1. Overall, if I bought both A and B as a set, I will be saving a lot of money:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

2. The likelihood that I will purchase the set consisting of A and B is:

1 very low	2 moderately low	3 slightly low	4 neither low nor high	5 slightly high	6 moderately high	7 very high
------------------	------------------------	----------------------	------------------------------	-----------------------	-------------------------	-------------------

3. The amount required to purchase both A and B as a set appears expensive to me:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

4. Overall, if I bought both A and B as a set, the deal I would be getting will be:

1 very poor	2 moderately poor	3 slightly poor	4 neither poor nor good	5 slightly good	6 moderately good	7 very good
-------------------	-------------------------	-----------------------	-------------------------------	-----------------------	-------------------------	-------------------

5. I will seriously consider buying the set consisting of A and B:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

6. Overall, buying both A and B as a set appears to be a good bargain:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

7. My inclination to buy the set consisting of A and B is:

1 very poor	2 moderately poor	3 slightly poor	4 neither poor nor good	5 slightly good	6 moderately good	7 very good
-------------------	-------------------------	-----------------------	-------------------------------	-----------------------	-------------------------	-------------------

8. The amount required to buy both A and B as a set is:

1 very low	2 moderately low	3 slightly low	4 neither low nor high	5 slightly high	6 moderately high	7 very high
------------------	------------------------	----------------------	------------------------------	-----------------------	-------------------------	-------------------

9. Overall, if I bought both A and B as a set, I would be taking advantage of an attractive price reduction:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

10. If I bought both A and B as a set, the monetary sacrifice I will be making would be:

- | | | | | | | |
|------------------|------------------------|----------------------|------------------------------|-----------------------|-------------------------|-------------------|
| 1
very
low | 2
moderately
low | 3
slightly
low | 4
neither low
nor high | 5
slightly
high | 6
moderately
high | 7
very
high |
|------------------|------------------------|----------------------|------------------------------|-----------------------|-------------------------|-------------------|

11. Compared to the cost of buying both A and B separately at their regular prices, the additional savings I can get by buying both A and B as a set are:

- | | | | | | | |
|-------------------|-------------------------|-----------------------|-------------------------------|-----------------------|-------------------------|-------------------|
| 1
very
poor | 2
moderately
poor | 3
slightly
poor | 4
neither poor
nor good | 5
slightly
good | 6
moderately
good | 7
very
good |
|-------------------|-------------------------|-----------------------|-------------------------------|-----------------------|-------------------------|-------------------|

12. Even if I bought both A and B separately at their regular prices, I would still be saving a lot of money:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

13. Compared to the cost of buying both A and B separately at their regular prices, buying both A and B as a set costs much less:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

14. Even if I bought both A and B separately at their regular prices, I would still be getting a good bargain:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

15. Compared to the cost of buying both A and B separately at their regular prices, buying both A and B as a set saves me a lot of money:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

16. Even if I bought both A and B separately at their regular prices, I would still be taking advantage of an attractive price reduction:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

17. Compared to the cost of buying both A and B separately at their regular prices, buying both A and B as a set offers very attractive savings:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

18. Even if I bought both A and B separately, at their regular prices, the deal I would be getting will be:

- | | | | | | | |
|-----------|-----------------|---------------|-----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very poor | moderately poor | slightly poor | neither poor nor good | slightly good | moderately good | very good |

19. At their regular prices, the total amount required to buy both A and B separately appears expensive to me:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

20. At their regular prices, the total amount required to buy both A and B separately is:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

21. At their regular prices, buying both A and B separately makes the monetary sacrifice I would be making:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

Section III

Instruction. Based on the information contained in the advertisement, fill in the blanks for the statements below.

-
1. The total amount you think you would be saving if you bought both A and B as a set: \$ _____
 2. The amount you think you would be saving if you bought A and B as a set instead of buying them separately at their regular prices: \$ _____
 3. The amount you think you would be saving if you bought A and B as a set instead of buying them separately at their regular prices: \$ _____
 4. The total amount you would have to spend if you bought both A and B separately at their regular prices: \$ _____
 5. The total amount you would have to spend if you bought both A and B separately at their regular prices: \$ _____
 6. The total amount you would have to spend if you bought both A and B as a set: \$ _____
 7. The regular price of A if bought separately: \$ _____
 8. The regular price of B if bought separately: \$ _____

Section IV

Instructions. To help us classify your answers along with those of others, please answer the following questions.

1. Have you recently taken part in a survey similar to this one?

yes _____ no _____

2. If yes, how recently? _____

3. Do you presently own a Garment bag?

yes _____ no _____

4. Do you presently own a Pullman?

yes _____ no _____

5. How knowledgeable are you about the type of luggage items seen in the advertisement?
(1 = Not knowledgeable at all; 7 = Extremely knowledgeable)

1 2 3 4 5 6 7

6. What do you think is the purpose of this survey?

7. Your age? _____

8. Your sex? Male/Female

9. Your class standing? sophomore/junior/senior

10. Your major: _____

Thank you for your participation

Please remain seated and raise your hand for assistance

APPENDIX G

PRETEST 6 INSTRUMENT (CELLS 5, 7)

Survey of Virginia Tech Students

Instructions

As part of a market research study, we are interested in the reactions of consumers such as yourself regarding an advertisement for luggage items. In the questionnaire that follows, you will be shown the advertisement and then asked some questions based on your reading of the advertisement. While completing this questionnaire, please remember that there are no right or wrong answers. In fact, different individuals are likely to answer the same questions differently.

Please do not write your name anywhere on this questionnaire. Every effort will be made to preserve your anonymity, so you may answer all questions accurately and honestly.

If you have any questions while completing this questionnaire, please raise your hand. Thank you for your time and cooperation.

Now please turn to the next page

Section I

Before we show you the luggage advertisement, we wish to ask a few questions about your shopping habits. The following statements are about how you shop and the feelings you have about shopping. Please indicate the degree that you agree or disagree with each statement by circling that number (between 1 and 7) that best expresses your feeling.

1. I usually buy the lowest-priced brand available:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

2. Advertisements for sales are usually misleading:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

3. When shopping, I always compare prices before making my selection:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

4. Price is the most important factor to me when making price decisions:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

5. I consider myself a real "bargain hunter":

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

6. Lower-priced items usually do not give good value for money:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

Section I

Before we show you the luggage advertisement, we wish to ask a few questions about your shopping habits. The following statements are about how you shop and the feelings you have about shopping. Please indicate the degree that you agree or disagree with each statement by circling that number (between 1 and 7) that best expresses your feeling.

1. I usually buy the lowest-priced brand available:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

2. Advertisements for sales are usually misleading:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

3. When shopping, I always compare prices before making my selection:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

4. Price is the most important factor to me when making price decisions:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

5. I consider myself a real "bargain hunter":

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

6. Lower-priced items usually do not give good value for money:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

Section II

Instructions. Imagine now that you are interested in purchasing the following two luggage items: 1) a Garment Bag and 2) a Pullman. Also, **assume that you wish to have matching luggage items and would therefore prefer to purchase these two luggage items together as a set.**

Assume that an advertisement featuring the type of luggage items you are looking for came to your attention. This advertisement is shown on the next page. **Read this advertisement as you would normally do as consumer interested in buying a matching 2-piece luggage set.** However, in this survey, we are interested in your reaction to the information contained in the advertisement, not on how well the advertisement is presented. Please note that this survey is NOT a test of your marketing or advertising knowledge.

Now please turn to the next page and carefully read the advertisement. For ease of reference, you should remove the advertisement page from your booklet before proceeding with the questionnaire.

Instructions. Based on your careful reading of the information contained in advertisement, please respond to each of the following statements below. For each statement, review the advertisement and circle that number (between 1 and 7) that best describes your opinion about that statement.

You may find several statements to be quite similar to each other. However, it is important that you examine and respond to each statement very carefully.

To respond to these statements, you will have to keep referring to the advertisement. For ease of reference, you should now remove the advertisement page from your booklet if you haven't already

1. Overall, if I bought both A and B as a set, I will be saving a lot of money:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

2. The likelihood that I will purchase the set consisting of A and B is:

- | | | | | | | |
|------------------|------------------------|----------------------|------------------------------|-----------------------|-------------------------|-------------------|
| 1
very
low | 2
moderately
low | 3
slightly
low | 4
neither low
nor high | 5
slightly
high | 6
moderately
high | 7
very
high |
|------------------|------------------------|----------------------|------------------------------|-----------------------|-------------------------|-------------------|

3. The amount required to purchase both A and B as a set appears expensive to me:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

4. Overall, if I bought both A and B as a set, the deal I would be getting will be:

- | | | | | | | |
|-------------------|-------------------------|-----------------------|-------------------------------|-----------------------|-------------------------|-------------------|
| 1
very
poor | 2
moderately
poor | 3
slightly
poor | 4
neither poor
nor good | 5
slightly
good | 6
moderately
good | 7
very
good |
|-------------------|-------------------------|-----------------------|-------------------------------|-----------------------|-------------------------|-------------------|

5. I will seriously consider buying the set consisting of A and B:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

6. Overall, buying both A and B as a set appears to be a good bargain:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

7. My inclination to buy the set consisting of A and B is:

- | | | | | | | |
|-------------------|-------------------------|-----------------------|-------------------------------|-----------------------|-------------------------|-------------------|
| 1
very
poor | 2
moderately
poor | 3
slightly
poor | 4
neither poor
nor good | 5
slightly
good | 6
moderately
good | 7
very
good |
|-------------------|-------------------------|-----------------------|-------------------------------|-----------------------|-------------------------|-------------------|

8. The amount required to buy both A and B as a set is:

- | | | | | | | |
|------------------|------------------------|----------------------|------------------------------|-----------------------|-------------------------|-------------------|
| 1
very
low | 2
moderately
low | 3
slightly
low | 4
neither low
nor high | 5
slightly
high | 6
moderately
high | 7
very
high |
|------------------|------------------------|----------------------|------------------------------|-----------------------|-------------------------|-------------------|

9. Overall, if I bought both A and B as a set, I would be taking advantage of an attractive price reduction:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

10. If I bought both A and B as a set, the monetary sacrifice I will be making would be:

1 very low	2 moderately low	3 slightly low	4 neither low nor high	5 slightly high	6 moderately high	7 very high
------------------	------------------------	----------------------	------------------------------	-----------------------	-------------------------	-------------------

11. Compared to the cost of buying both A and B separately at their sale prices, the additional savings I can get by buying both A and B as a set are:

1 very poor	2 moderately poor	3 slightly poor	4 neither poor nor good	5 slightly good	6 moderately good	7 very good
-------------------	-------------------------	-----------------------	-------------------------------	-----------------------	-------------------------	-------------------

12. Even if I bought both A and B separately at their sale prices, I would still be saving a lot of money:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

13. Compared to the cost of buying both A and B separately at their sale prices, buying both A and B as a set costs much less:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

14. Even if I bought both A and B separately at their sale prices, I would still be getting a good bargain:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

15. Compared to the cost of buying both A and B separately at their sale prices, buying both A and B as a set saves me a lot of money:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

16. Even if I bought both A and B separately at their sale prices, I would still be taking advantage of an attractive price reduction:

1 strongly disagree	2 moderately disagree	3 slightly disagree	4 neither disagree nor agree	5 slightly agree	6 moderately agree	7 strongly agree
---------------------------	-----------------------------	---------------------------	------------------------------------	------------------------	--------------------------	------------------------

17. Compared to the cost of buying both A and B separately at their sale prices, buying both A and B as a set offers very attractive savings:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

18. Even if I bought both A and B separately, at their sale prices, the deal I would be getting will be:

- | | | | | | | |
|-----------|-----------------|---------------|-----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very poor | moderately poor | slightly poor | neither poor nor good | slightly good | moderately good | very good |

19. At their sale prices, the total amount required to buy both A and B separately appears expensive to me:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

20. At their regular prices, the total amount required to buy both A and B separately appears expensive to me:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

21. At their sale prices, the total amount required to buy both A and B separately is:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

22. At their regular prices, the total amount required to buy both A and B separately is:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

23. At their sale prices, buying buy both A and B separately makes the total monetary sacrifice I would be making:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

24. At their regular prices, buying both A and B separately makes the monetary sacrifice I would be making:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

Section III

Instruction. Based on the information contained in the advertisement, fill in the blanks for the statements below.

-
1. The total amount you think you would be saving if you bought both A and B as a set: \$ _____
 2. The amount you think you would be saving if you bought A and B as a set instead of buying them separately at their sale prices: \$ _____
 3. The amount you think you would be saving if you bought A and B as a set instead of buying them separately at their regular prices: \$ _____
 4. The total amount you would have to spend if you bought both A and B separately at their regular prices: \$ _____
 5. The total amount you would have to spend if you bought both A and B separately at their sale prices: \$ _____
 6. The total amount you would have to spend if you bought both A and B as a set: \$ _____
 7. The regular price of A if bought separately: \$ _____
 8. The sale price of A if bought separately: \$ _____
 9. The regular price of B if bought separately: \$ _____
 11. The sale price of B if bought separately: \$ _____

Section IV

Instructions. To help us classify your answers along with those of others, please answer the following questions.

1. Have you recently taken part in a survey similar to this one?

yes _____ no _____

2. If yes, how recently? _____

3. Do you presently own a Garment bag?

yes _____ no _____

4. Do you presently own a Pullman?

yes _____ no _____

5. How knowledgeable are you about the type of luggage items seen in the advertisement?
(1 = Not knowledgeable at all; 7 = Extremely knowledgeable)

1 2 3 4 5 6 7

6. What do you think is the purpose of this survey?

7. Your age? _____

8. Your sex? Male/Female

9. Your class standing? sophomore/junior/senior

10. Your major: _____

Thank you for your participation

Please remain seated and raise your hand for assistance

APPENDIX H

EXPERIMENT 2 INSTRUMENT (CELLS 1-3)

Survey of Virginia Tech Students

Instructions

As part of a market research study, we are interested in the reactions of consumers such as yourself regarding an advertisement for luggage items. In the questionnaire that follows, you will be shown the advertisement and then asked some questions based on your reading of the advertisement. While completing this questionnaire, please remember that there are no right or wrong answers. In fact, different individuals are likely to answer the same questions differently.

Please do not write your name anywhere on this questionnaire. Every effort will be made to preserve your anonymity, so you may answer all questions accurately and honestly.

If you have any questions while completing this questionnaire, please raise your hand. Thank you for your time and cooperation.

Now please turn to the next page

Section I

Instructions. Before we show you the luggage advertisement, we wish to ask a few questions about your shopping habits. The following statements are about how you shop and the feelings you have about shopping. Please indicate the degree that you agree or disagree with each statement by circling that number (between 1 and 7) that best expresses your feeling.

1. I usually buy the lowest-priced brand available:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

2. Advertisements for regulars are usually misleading:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

3. When shopping, I always compare prices before making my selection:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

4. Price is an important factor to me when making purchase decisions:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

5. I consider myself a real "bargain hunter":

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

6. Lower-priced items do not give good value for money:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

Section II

Instructions. Imagine now that you are interested in purchasing the following two luggage items: 1) a Garment Bag and 2) a Pullman. Also, **assume that you wish to have matching luggage items and would therefore prefer to purchase these two luggage items together as a set.**

Assume that an advertisement featuring the type of luggage items you are looking for came to your attention. This advertisement is shown on the next page. **Read this advertisement as you would normally do as a consumer interested in buying a matching 2-piece luggage set.** However, in this survey, we are interested in your reaction to the information contained in the advertisement, not on how well the advertisement is presented. Please note that this survey is NOT a test of your marketing or advertising knowledge.

Now please turn to the next page and carefully read the advertisement. For ease of reference, you should remove the advertisement page from your booklet before proceeding with the questionnaire.

Instructions. Based on your careful reading of the information contained in the advertisement, please respond to each of the following statements below. For each statement, review the advertisement and circle the number (between 1 and 7) that best describes your opinion about that statement.

You may find several statements to be quite similar to each other. However, it is important that you examine and respond to each statement very carefully.

To respond to these statements, you will have to keep referring to the advertisement. For ease of reference, you should now remove the advertisement page from your booklet if you haven't already.

1. Overall, if I bought both A and B as a set, I will be saving a lot of money:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

2. The likelihood that I would purchase the set consisting of A and B is:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

3. The amount required to purchase both A and B as a set appears expensive to me:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

4. Overall, if I bought both A and B as a set, the deal I would be getting is :

- | | | | | | | |
|-----------|-----------------|---------------|-----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very poor | moderately poor | slightly poor | neither poor nor good | slightly good | moderately good | very good |

5. I would seriously consider buying the set consisting of A and B:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

6. Overall, buying both A and B as a set appears to be a good bargain:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

7. My inclination to buy the set consisting of A and B is:

- | | | | | | | |
|----------|----------------|--------------|-----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither poor nor high | slightly high | moderately high | very high |

8. The amount of money required to buy both A and B as a set is:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

9. Overall, if I bought both A and B as a set, I would be taking advantage of an attractive price reduction:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

10. At the offer price, buying both A and B as a set makes the monetary sacrifice I would be making:

1	2	3	4	5	6	7
very low	moderately low	slightly low	neither low nor high	slightly high	moderately high	very high

11. Compared to the cost of buying both A and B separately at their regular prices, the additional savings I can get by buying both A and B as a set are:

1	2	3	4	5	6	7
very low	moderately low	slightly low	neither poor nor high	slightly high	moderately high	very high

12. Even if I bought both A and B separately at their regular prices, I would still be saving a lot of money:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

13. At their regular prices, buying both A and B separately makes the total monetary sacrifice I would be making:

1	2	3	4	5	6	7
very low	moderately low	slightly low	neither low nor high	slightly high	moderately high	very high

14. Compared to the cost of buying both A and B separately at their regular prices, buying both A and B as a set costs much less:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

15. At their regular prices, the total amount required to buy both A and B separately appears expensive to me:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

16. Even if I bought both A and B separately at their regular prices, I would still be getting a good bargain:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

17. Compared to the cost of buying both A and B **separately** at their **regular prices**, buying both A and B **as a set** saves me a lot of money:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

18. Even if I bought both A and B **separately** at their **regular prices**, I would still be taking advantage of an attractive price reduction:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

19. At their **regular prices**, the total amount required to buy both A and B **separately** is:

1	2	3	4	5	6	7
very low	moderately low	slightly low	neither low nor high	slightly high	moderately high	very high

20. Compared to the cost of buying both A and B **separately** at their **regular prices**, buying both A and B **as a set** offers very attractive savings:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

21. Even if I bought both A and B **separately** at their **regular prices**, the deal I would be getting will be:

1	2	3	4	5	6	7
very poor	moderately poor	slightly poor	neither poor nor good	slightly good	moderately good	very good

Section III

Instruction. Based on the information contained in the advertisement, fill in the blanks for the statements below.

-
1. The total amount you think you would be saving if you bought both A and B as a set: \$ _____
 2. The amount you think you would be saving if you bought A and B as a set instead of buying them separately at their regular prices: \$ _____
 3. The total amount you think you would be saving if you bought both A and B separately at their regular prices? \$ _____
 4. The total amount you would have to spend if you bought both A and B separately at their regular prices: \$ _____
 5. The total amount you would have to spend if you bought both A and B as a set: \$ _____
 6. The regular price of A if bought separately: \$ _____
 7. The regular price of B if bought separately: \$ _____
 8. Based on your knowledge, at what price would an item like A normally sell for in the market? \$ _____
 9. Based on your knowledge, at what price would an item like B normally sell for in the market? \$ _____

Section IV

Instructions. To help us classify your answers along with those of others, please answer the following questions.

1. Have you recently taken part in a survey similar to this one?

yes _____ no _____

2. If yes, how recently? _____

3. Do you presently own a Garment bag?

yes _____ no _____

4. Do you presently own a Pullman?

yes _____ no _____

5. How knowledgeable are you about the type of luggage items seen in the advertisement?
(1 = Not knowledgeable at all; 7 = Extremely knowledgeable)

1 2 3 4 5 6 7

6. What do you think is the purpose of this survey?

7. Your age? _____

8. Your sex? Male/Female

9. Your class standing? sophomore/junior/senior

10. Your major: _____

Thank you for your participation

Please remain seated and raise your hand for assistance

APPENDIX I

EXPERIMENT 2 INSTRUMENT (CELLS 4-9)

Survey of Virginia Tech Students

Instructions

As part of a market research study, we are interested in the reactions of consumers such as yourself regarding an advertisement for luggage items. In the questionnaire that follows, you will be shown the advertisement and then asked some questions based on your reading of the advertisement. While completing this questionnaire, please remember that there are no right or wrong answers. In fact, different individuals are likely to answer the same questions differently.

Please do not write your name anywhere on this questionnaire. Every effort will be made to preserve your anonymity, so you may answer all questions accurately and honestly.

If you have any questions while completing this questionnaire, please raise your hand. Thank you for your time and cooperation.

Now please turn to the next page

Section I

Instructions. Before we show you the luggage advertisement, we wish to ask a few questions about your shopping habits. The following statements are about how you shop and the feelings you have about shopping. Please indicate the degree that you agree or disagree with each statement by circling that number (between 1 and 7) that best expresses your feeling.

1. I usually buy the lowest-priced brand available:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

2. Advertisements for sales are usually misleading:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

3. When shopping, I always compare prices before making my selection:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

4. Price is an important factor to me when making purchase decisions:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

5. I consider myself a real "bargain hunter":

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

6. Lower-priced items do not give good value for money:

1	2	3	4	5	6	7
strongly disagree	moderately disagree	slightly disagree	neither disagree nor agree	slightly agree	moderately agree	strongly agree

Section II

Instructions. Imagine now that you are interested in purchasing the following two luggage items: 1) a Garment Bag and 2) a Pullman. Also, **assume that you wish to have matching luggage items and would therefore prefer to purchase these two luggage items together as a set.**

Assume that an advertisement featuring the type of luggage items you are looking for came to your attention. This advertisement is shown on the next page. **Read this advertisement as you would normally do as a consumer interested in buying a matching 2-piece luggage set.** However, in this survey, we are interested in your reaction to the information contained in the advertisement, not on how well the advertisement is presented. Please note that this survey is NOT a test of your marketing or advertising knowledge.

Now please turn to the next page and carefully read the advertisement. For ease of reference, you should remove the advertisement page from your booklet before proceeding with the questionnaire.

Instructions. Based on your careful reading of the information contained in the advertisement, please respond to each of the following statements below. For each statement, review the advertisement and circle the number (between 1 and 7) that best describes your opinion about that statement.

You may find several statements to be quite similar to each other. However, it is important that you examine and respond to each statement very carefully.

To respond to these statements, you will have to keep referring to the advertisement. For ease of reference, you should now remove the advertisement page from your booklet if you haven't already.

1. Overall, if I bought both A and B as a set, I will be saving a lot of money:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

2. The likelihood that I would purchase the set consisting of A and B is:

- | | | | | | | |
|------------------|------------------------|----------------------|------------------------------|-----------------------|-------------------------|-------------------|
| 1
very
low | 2
moderately
low | 3
slightly
low | 4
neither low
nor high | 5
slightly
high | 6
moderately
high | 7
very
high |
|------------------|------------------------|----------------------|------------------------------|-----------------------|-------------------------|-------------------|

3. The amount required to purchase both A and B as a set appears expensive to me:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

4. Overall, if I bought both A and B as a set, the deal I would be getting is :

- | | | | | | | |
|-------------------|-------------------------|-----------------------|-------------------------------|-----------------------|-------------------------|-------------------|
| 1
very
poor | 2
moderately
poor | 3
slightly
poor | 4
neither poor
nor good | 5
slightly
good | 6
moderately
good | 7
very
good |
|-------------------|-------------------------|-----------------------|-------------------------------|-----------------------|-------------------------|-------------------|

5. I would seriously consider buying the set consisting of A and B:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

6. Overall, buying both A and B as a set appears to be a good bargain:

- | | | | | | | |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|
| 1
strongly
disagree | 2
moderately
disagree | 3
slightly
disagree | 4
neither disagree
nor agree | 5
slightly
agree | 6
moderately
agree | 7
strongly
agree |
|---------------------------|-----------------------------|---------------------------|------------------------------------|------------------------|--------------------------|------------------------|

7. My inclination to buy the set consisting of A and B is:

- | | | | | | | |
|------------------|------------------------|----------------------|-------------------------------|-----------------------|-------------------------|-------------------|
| 1
very
low | 2
moderately
low | 3
slightly
low | 4
neither poor
nor high | 5
slightly
high | 6
moderately
high | 7
very
high |
|------------------|------------------------|----------------------|-------------------------------|-----------------------|-------------------------|-------------------|

8. The amount of money required to buy both A and B as a set is:

- | | | | | | | |
|------------------|------------------------|----------------------|------------------------------|-----------------------|-------------------------|-------------------|
| 1
very
low | 2
moderately
low | 3
slightly
low | 4
neither low
nor high | 5
slightly
high | 6
moderately
high | 7
very
high |
|------------------|------------------------|----------------------|------------------------------|-----------------------|-------------------------|-------------------|

9. Overall, if I bought both A and B as a set, I would be taking advantage of an attractive price reduction:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

10. At the offer price, buying both A and B as a set makes the monetary sacrifice I would be making:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

11. Compared to the cost of buying both A and B separately at their sale prices, the additional savings I can get by buying both A and B as a set are:

- | | | | | | | |
|----------|----------------|--------------|-----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither poor nor high | slightly high | moderately high | very high |

12. At their sale prices, the total amount required to buy both A and B separately appears expensive to me:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

13. Even if I bought both A and B separately at their sale prices, I would still be saving a lot of money:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

14. At their regular prices, buying both A and B separately makes the total monetary sacrifice I would be making:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

15. Compared to the cost of buying both A and B separately at their sale prices, buying both A and B as a set costs much less:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

16. At their regular prices, the total amount required to buy both A and B separately appears expensive to me:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

17. Even if I bought both A and B separately at their sale prices, I would still be getting a good bargain:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

18. At their sale prices, the total amount required to buy both A and B separately is:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

19. Compared to the cost of buying both A and B separately at their sale prices, buying both A and B as a set saves me a lot of money:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

20. At their sale prices, buying buy both A and B separately makes the total monetary sacrifice I would be making:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

21. Even if I bought both A and B separately at their sale prices, I would still be taking advantage of an attractive price reduction:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

22. At their regular prices, the total amount required to buy both A and B separately is:

- | | | | | | | |
|----------|----------------|--------------|----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very low | moderately low | slightly low | neither low nor high | slightly high | moderately high | very high |

23. Compared to the cost of buying both A and B separately at their sale prices, buying both A and B as a set offers very attractive savings:

- | | | | | | | |
|-------------------|---------------------|-------------------|----------------------------|----------------|------------------|----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| strongly disagree | moderately disagree | slightly disagree | neither disagree nor agree | slightly agree | moderately agree | strongly agree |

24. Even if I bought both A and B separately at their sale prices, the deal I would be getting will be:

- | | | | | | | |
|-----------|-----------------|---------------|-----------------------|---------------|-----------------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| very poor | moderately poor | slightly poor | neither poor nor good | slightly good | moderately good | very good |

Section III

Instruction. Based on the information contained in the advertisement, fill in the blanks for the statements below.

-
1. The total amount you think you would be saving if you bought both A and B as a set: \$ _____
 2. The amount you think you would be saving if you bought A and B as a set instead of buying them separately at their sale prices: \$ _____
 3. The total amount you think you would be saving if you bought both A and B separately at their sale prices instead of buying them at their regular prices? \$ _____
 4. The amount you think you would be saving if you bought A and B as a set instead of buying them separately at their regular prices: \$ _____
 5. The total amount you would have to spend if you bought both A and B separately at their regular prices: \$ _____
 6. The total amount you would have to spend if you bought both A and B separately at their sale prices: \$ _____
 7. The total amount you would have to spend if you bought both A and B as a set: \$ _____
 8. The regular price of A if bought separately: \$ _____
 9. The sale price of A if bought separately: \$ _____
 10. The regular price of B if bought separately: \$ _____
 11. The sale price of B if bought separately: \$ _____
 12. Based on your knowledge, at what price would an item like A normally sell for in the market? \$ _____
 13. Based on your knowledge, at what price would an item like B normally sell for in the market? \$ _____

Section IV

Instructions. To help us classify your answers along with those of others, please answer the following questions.

1. Have you recently taken part in a survey similar to this one?

yes _____ no _____

2. If yes, how recently? _____

3. Do you presently own a Garment bag?

yes _____ no _____

4. Do you presently own a Pullman?

yes _____ no _____

5. How knowledgeable are you about the type of luggage items seen in the advertisement?
(1 = Not knowledgeable at all; 7 = Extremely knowledgeable)

1 2 3 4 5 6 7

6. What do you think is the purpose of this survey?

7. Your age? _____

8. Your sex? Male/Female

9. Your class standing? sophomore/junior/senior

10. Your major: _____

Thank you for your participation

Please remain seated and raise your hand for assistance

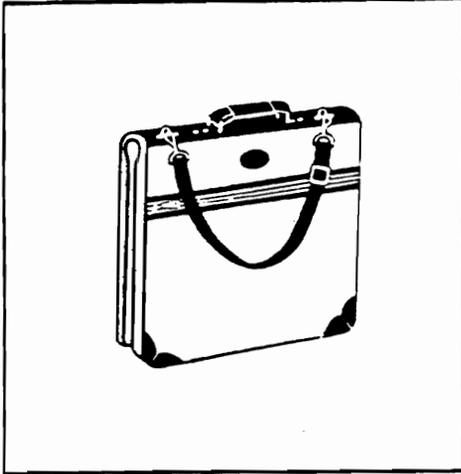
APPENDIX J

EXPERIMENT 2 STIMULUS MATERIAL (CELLS 1-9)

Survey #1 of Virginia Tech Students

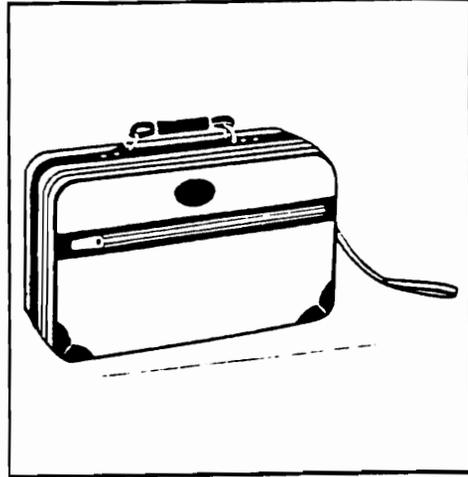
ADVERTISEMENT

Item A
(44" Garment Bag)



- Durable polyester material
- Unique hanger locking system
- Fully zippered for easy packing
- Fits in overhead storage

Item B
(27" Pullman)



- Durable polyester material
- Protective bottom "feet"
- Reinforced steel frame
- Large interior & outer pockets

Price if items bought separately

Item

Regular

A
B

\$99
\$99

Total: \$198

OR

Buy both A and B as a set for \$198

Remove Advertisement Page for Ease of Reference

Survey #2 of Virginia Tech Students

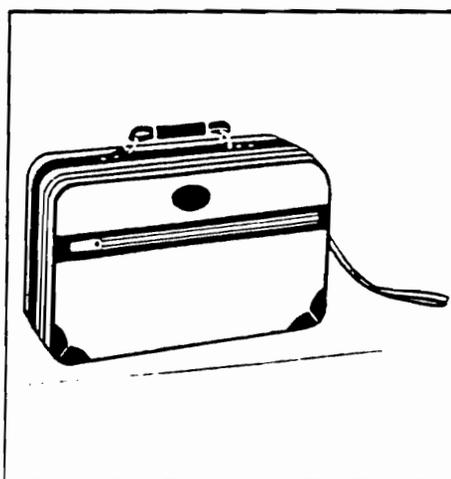
ADVERTISEMENT

Item **A**
(44" Garment Bag)



- Durable polyester material
- Unique hanger locking system
- Fully zippered for easy packing
- Fits in overhead storage

Item **B**
(27" Pullman)



- Durable polyester material
- Protective bottom "feet"
- Reinforced steel frame
- Large interior & outer pockets

Price if items bought separately

Item

Regular

A
B

\$99
\$99

Total: **\$198**

OR

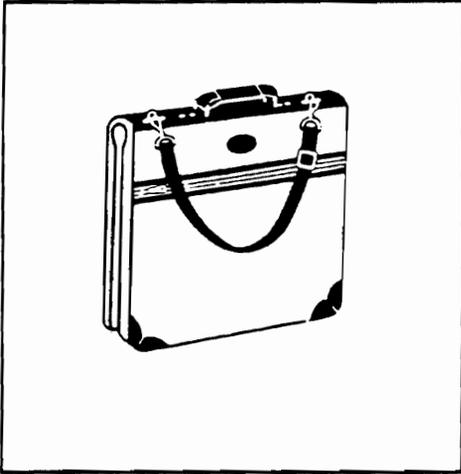
Buy both **A** and **B** as a set for **\$178**

Remove Advertisement Page for Ease of Reference

Survey #3 of Virginia Tech Students

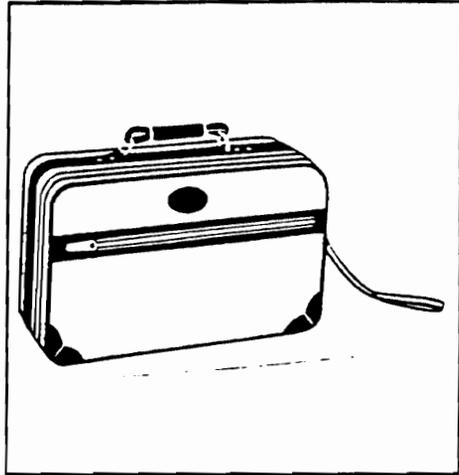
ADVERTISEMENT

Item **A**
(44" Garment Bag)



- Durable polyester material
- Unique hanger locking system
- Fully zippered for easy packing
- Fits in overhead storage

Item **B**
(27" Pullman)



- Durable polyester material
- Protective bottom "feet"
- Reinforced steel frame
- Large interior & outer pockets

Price if items bought separately

Item

A
B

Regular

\$99
\$99

Total: **\$198**

OR

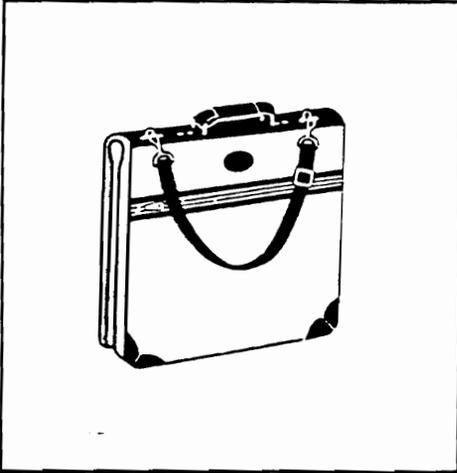
Buy both **A** and **B** as a set for **\$158**

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Survey #4 of Virginia Tech Students

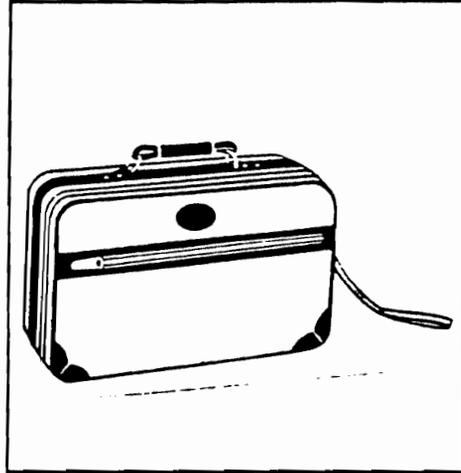
ADVERTISEMENT

Item A
(44" Garment Bag)



- Durable polyester material
- Unique hanger locking system
- Fully zippered for easy packing
- Fits in overhead storage

Item B
(27" Pullman)



- Durable polyester material
- Protective bottom "feet"
- Reinforced steel frame
- Large interior & outer pockets

Price if items bought separately

<u>Item</u>	<u>Regular</u>	<u>Sale</u>
A	\$99	\$89
B	\$99	\$89
	Total: \$198	Total: \$178

OR

Buy both **A** and **B** as a set for \$178

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Survey #5 of Virginia Tech Students

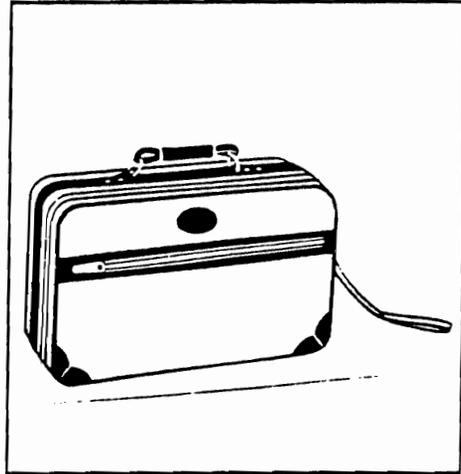
ADVERTISEMENT

Item A
(44" Garment Bag)



- Durable polyester material
- Unique hanger locking system
- Fully zippered for easy packing
- Fits in overhead storage

Item B
(27" Pullman)



- Durable polyester material
- Protective bottom "feet"
- Reinforced steel frame
- Large interior & outer pockets

Price if items bought separately

<u>Item</u>	<u>Regular</u>	<u>Sale</u>
A	\$99	\$89
B	\$99	\$89
	Total: \$198	Total: \$178

OR

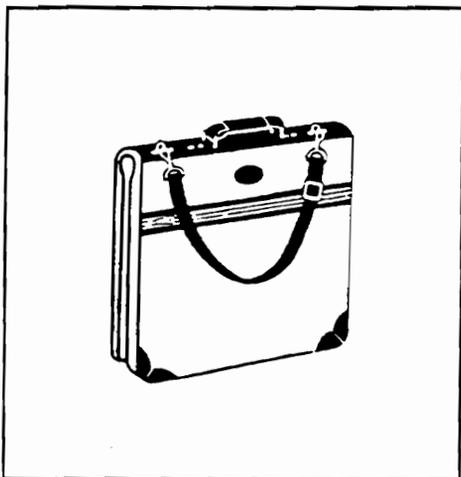
Buy both **A** and **B** as a set for \$158

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Survey #6 of Virginia Tech Students

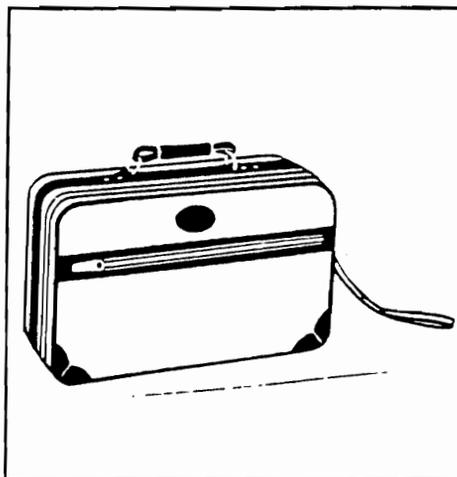
ADVERTISEMENT

Item **A**
(44" Garment Bag)



- Durable polyester material
- Unique hanger locking system
- Fully zippered for easy packing
- Fits in overhead storage

Item **B**
(27" Pullman)



- Durable polyester material
- Protective bottom "feet"
- Reinforced steel frame
- Large interior & outer pockets

Price if items bought separately

<u>Item</u>	<u>Regular</u>	<u>Sale</u>
A	\$99	\$89
B	\$99	\$89
	Total: \$198	Total: \$178

OR

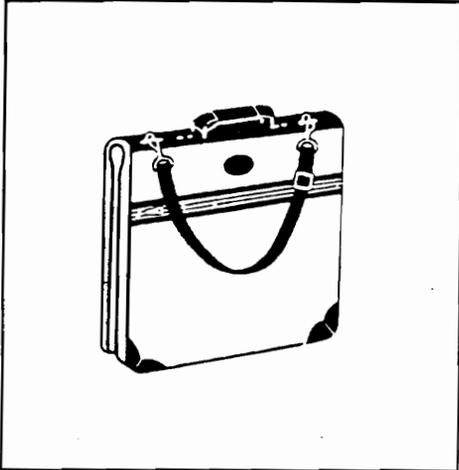
Buy both **A** and **B** as a set for **\$138**

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Survey #7 of Virginia Tech Students

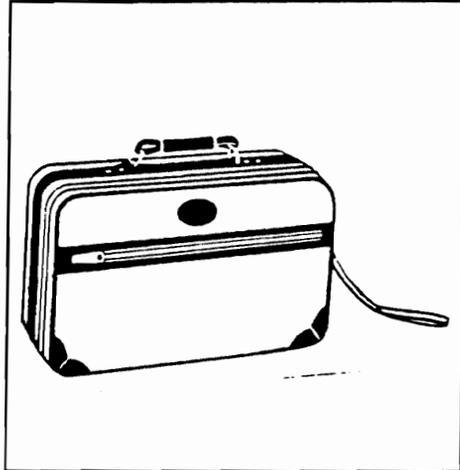
ADVERTISEMENT

Item **A**
(44" Garment Bag)



- Durable polyester material
- Unique hanger locking system
- Fully zippered for easy packing
- Fits in overhead storage

Item **B**
(27" Pullman)



- Durable polyester material
- Protective bottom "feet"
- Reinforced steel frame
- Large interior & outer pockets

Price if items bought separately

<u>Item</u>	<u>Regular</u>	<u>Sale</u>
A	\$99	\$79
B	\$99	\$79
	Total: \$198	Total: \$158

OR

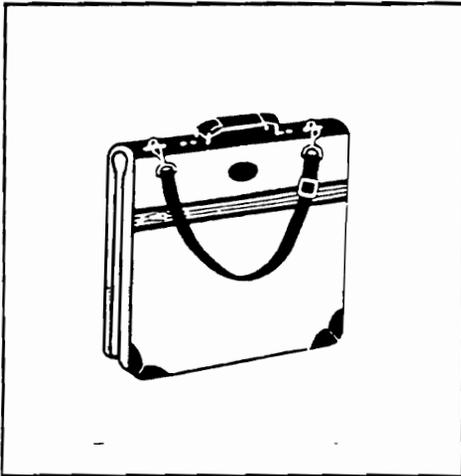
Buy both **A** and **B** as a set for \$158

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Survey #8 of Virginia Tech Students

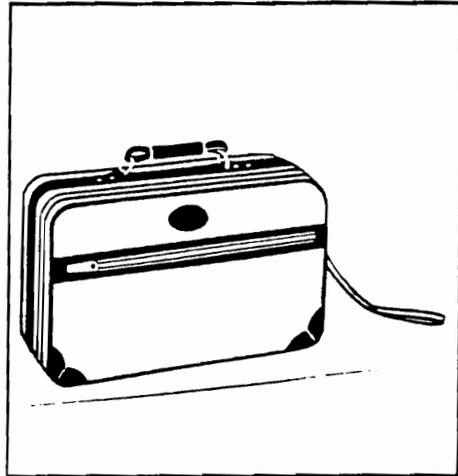
ADVERTISEMENT

Item A
(44" Garment Bag)



- Durable polyester material
- Unique hanger locking system
- Fully zippered for easy packing
- Fits in overhead storage

Item B
(27" Pullman)



- Durable polyester material
- Protective bottom "feet"
- Reinforced steel frame
- Large interior & outer pockets

Price if items bought separately

<u>Item</u>	<u>Regular</u>	<u>Sale</u>
A	\$99	\$79
B	\$99	\$79
	Total: \$198	Total: \$158

OR

Buy both **A** and **B** as a set for **\$138**

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Survey #9 of Virginia Tech Students

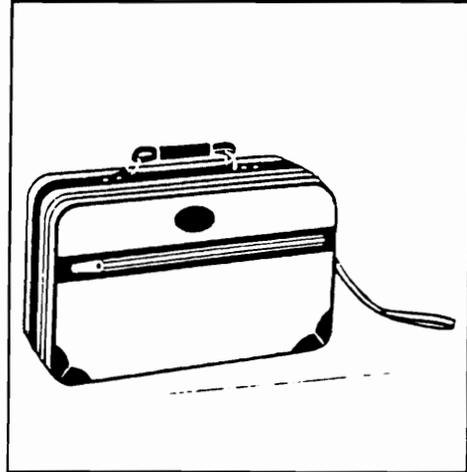
ADVERTISEMENT

Item A
(44" Garment Bag)



- Durable polyester material
- Unique hanger locking system
- Fully zippered for easy packing
- Fits in overhead storage

Item B
(27" Pullman)



- Durable polyester material
- Protective bottom "feet"
- Reinforced steel frame
- Large interior & outer pockets

Price if items bought separately

<u>Item</u>	<u>Regular</u>	<u>Sale</u>
A	\$99	\$79
B	\$99	\$79
	Total: \$198	Total: \$158

OR

Buy both **A** and **B** as a set for **\$118**

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VITA

Address

Department of Marketing
College of Business Administration
Texas A&M University
College Station, TX 77843

Date of Birth: August 8, 1961

EDUCATION

Academic Degrees

- 1990 Doctor of Philosophy
 Virginia Polytechnic Institute
 and State University
 Blacksburg, Virginia, U.S.A.
 Major: Marketing
 Minor: Management Science
- 1983 B.S (Engineering)
 University of Roorkee
 Roorkee, India.
 Concentration: Mathematics, Engineering,
 Industrial Management

PUBLICATIONS

Refereed Articles

Noreen M. Klein and Manjit S. Yadav (1989), "Context Effects on Effort and Accuracy in Choice: An Enquiry into Adaptive Decision Making," Journal of Consumer Research, 16 (March), 411-421.

Julie L. Ozanne, Edward F. Fern, and Manjit S. Yadav (1989), "A Conceptual Framework for Evaluating Interdisciplinary Research in Marketing," in Review of Marketing, ed. Valarie A. Zeithaml, Chicago, IL: American Marketing Association, forthcoming.

Published Presentations (Refereed)

Manjit S. Yadav and George R. Franke (1989), "Investigating the Behavioral Rationale for Rescaling Marketing Measures," in Proceedings, Summer Educators' Conference, Chicago, IL: American Marketing Association, forthcoming.

Edward F. Fern, Julie L. Ozanne, and Manjit S. Yadav (1987) "The Role of Evaluative Criteria in the Development of Marketing Knowledge," in Pro-

ceedings, eds. Russell W. Belk et al., Winter Educators' Conference, San Antonio, TX: American Marketing Association, (abstract), 275.

HONORS AND AWARDS

American Marketing Association Doctoral Consortium Fellow, 1989.

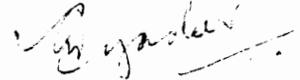
College of Business nominee for the Richard D. Irwin Foundation Doctoral Fellowship, 1989.

College of Business nominee for the AACSB Doctoral Fellowship, 1989.

Department of Marketing nominee for the Cunningham Doctoral Fellowship, Virginia Tech, Blacksburg, 1989.

Beta Gamma Sigma, Virginia Tech, Blacksburg, Virginia, 1988.

Harold A. Berry Scholarship, Purchasing Management Association of the Carolinas-Viginia, 1986.



Manjit S. Yadav