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ABSTRACT

Title of dissertation: THE DIMENSIONS OF BRAND LOYALTY AND THEIR RELATIONSHIP TO BRAND BEHAVIORS AND MARKETING ACTIONS

Adlai David Samuel Dorsett, Doctor of Philosophy, 1999

Dissertation directed by: Professor Richard M. Durand
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The success of brands in the marketplace depends critically on the level of brand loyalty the brand is able to engender. In the academic literature it is well accepted that brand loyalty is a concept that should be understood in terms of its behavioral and attitudinal dimensions. However, much of the recent brand loyalty research, with its reliance on scanner data, has failed to incorporate the attitudinal dimension of brand loyalty. Thus much of the body of knowledge about the relationship of brand loyalty and consumer behavior and how marketing actions differentially impact the behavior of different loyalty segments is subject to qualification.

This study looks at how the brand behaviors of different loyalty segments change in response to various marketing actions, specifically sales promotion actions in the form of price changes and coupons. The four brand behaviors considered in the study are brand choice, purchase quantity, purchase timing, and brand consumption. The dissertation merges the attitudinal and behavioral approaches to brand loyalty. This merger is made possible by our ability to combine survey data (from which we gather brand attitudes) and scanner data (from which we gather purchase information) from shoppers in the loyalty program of a regional supermarket chain.

We view the marketing actions of pricing and couponing as communication instruments used by marketers and use Petty and Cacioppo's (1986) Elaboration Likelihood Model to hypothesize that attitudinal loyals will be more price sensitive than behavioral loyals and that behavioral loyals will be more coupon sensitive than attitudinal loyals. We find support for our hypotheses for choice and purchase quantity behaviors. Our hypotheses with respect to purchase timing and consumption rate behavior were not as well supported.

Contributions of the dissertation include an understanding of the role of the two dimensions of brand loyalty in affecting consumer behavior, which should enable managers to more efficiently tailor their marketing actions based on the composition of their target market and the behavior they desire to evoke.

THE DIMENSIONS OF BRAND LOYALTY AND THEIR RELATIONSHIP TO BRAND BEHAVIORS AND MARKETING ACTIONS

by

Adlai David Samuel Dorsett

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CHAPTER 1

INTRODUCTION

Marketing consultant Jon Berry (1996) has pointed to the "quality equality" quandary in which many marketers find themselves. By offering high quality products marketers hope to produce satisfied customers ensuring the continued growth, success, and profitability of their firm. However, with the ongoing phenomenon of "quality equality," marketers are unable to differentiate themselves solely on the basis of quality given the uniformly high quality of market offerings. Both the scholarly literature (e.g., Yim and Kannan 1999) and the business press (e.g., Reichheld with Teal 1996) are now unanimous in pointing to loyalty — not customer satisfaction — as the key to profitability.

It is in the midst of struggle that the value of loyalty is most precious. This point is forcefully made by Hallberg (1995, p. 52), who notes that "Nowhere is brand loyalty more critical to profitability than in the dog-eat-dog world of packaged-goods marketing, where mature markets and mature brands are the norm and the battleground is share of market." Brand loyalty is not only critical to the profitability of packaged-goods brands but to any market where the consequences faced by the customer as a result of switching are modest or inconsequential. A chronic condition of brand disloyalty or an acute shortage of brand loyal purchasers presents a troubling prognosis for any brand.

It has long been argued (e.g., Day 1969, and more recently by Dick and Basu 1994) that brand loyalty is a concept that should be understood in both behavioral and attitudinal terms. However, much of the brand loyalty research, although acknowledging that brand loyalty is bi-dimensional, has not successfully combined both aspects of brand loyalty into their operationalization of brand loyalty. Two primary streams of research have emerged in the brand loyalty literature. One stream has focused on the attitudinal aspect of brand loyalty and its relationship to various other psychological constructs, for example, involvement (Beatty, Kahle, and Homer 1988) and satisfaction (Bloemer and Kasper 1995). The second more bountiful stream has focused on the behavioral aspect of brand loyalty and its relationship to various behaviors, particularly brand choice and purchase quantity (e.g., Krishnamurthi and Raj 1988).

A smaller third stream of research has examined brand loyalty in light of its behavioral and attitudinal dimensions. One representative study in this stream is a study by Baldinger and Rubinson (1996). In their study, Baldinger and Rubinson find brand attitude to be a more certain predictor of *future* brand loyalty than *prior* behavioral brand loyalty. Our study looks at how the brand behaviors of different segments — segmented by both attitudinal and behavioral loyalties — change in response to the marketing variables of price and coupons. In this study we merge the attitudinal and behavioral approaches to brand loyalty.

The brand behaviors considered in our study are brand choice, purchase quantity, purchase timing, and consumption rate. Brand choice, purchase quantity, and purchase timing behaviors are behaviors that have been the subject of many studies in the brand loyalty literature (e.g., Grover and Srinivasan 1992; Gupta 1988; Jain and Vilcassim 1991; McCarthy, Kannan, Chandrasekharan and Wright 1992). Our study of these behaviors affords us the opportunity to compare our findings against existing literature and enables us to determine if our ability to operationalize brand loyalty (in a manner not possible in other studies) leads us to conclusions consistent with or differing from that suggested by extant literature. In this study we are able to explicitly determine if an attitudinal or a behavioral operationalization of brand loyalty leads to different conclusions with respect to the effect of marketing actions on the brand behaviors of consumers. We are also motivated to examine the behaviors of brand choice, purchase quantity, purchase timing, and consumption rate because of their undeniable managerial relevance.

The fourth brand behavior considered in this study is household consumption rate, that is, the rate at which a given purchase quantity is consumed over the course of a consumption spell. This behavior has not received nearly the same degree of attention as the previous three behaviors. For many brands increased consumption among current users is the most expedient way toward brand growth (Wansink 1994).

Increasing consumption rate is an important managerial concern. It has been shown that marketing actions are capable of increasing consumption rates (Wansink 1996; Wansink and Ray 1996). Our study investigates the extent to which marketing actions and brand loyalty interact to affect consumption rate.

The State of Affairs: Effect of Marketing Actions on Loyalty

Recently, there has been considerable concern about the effect of marketing actions, particularly sales promotions, on brand loyalty. Many brands command the same level of loyalty — very little. For packaged goods the problem of "loyalty parity" has been diagnosed as "particularly acute" (Hallberg 1995, pp. 4,5). There is mounting evidence that the long-term impact of increased promotions is greater price sensitivity on the part of consumers (Mela, Gupta, and Lehmann 1997; Papatla and Krishnamurthi 1996). One benefit of brand loyalty is decreased price sensitivity. Greater price sensitivity is indicative of declining brand loyalty, which suggests erosion of brand equity[1], a condition contrary to the goal of brand managers.

Sales promotion has multiple effects on consumer brand behavior. It affects brand choice, purchase acceleration (timing and quantity), and potentially brand consumption. Gupta (1988) finds that brand switching is responsible for most (84%) of the sales increase due to promotion. The increase due to purchase acceleration (16%) is due mostly to timing

acceleration (14%) and the reminder is due to quantity acceleration (2%). The models employed by Gupta point to how promotion affects purchase behavior. However, there was no modeling of the effect of promotion on consumption behavior. Purchase (in most cases) precedes consumption. Hence, modeling the effect of promotion on purchase quantity only models pre-consumption behavior. As useful as such models may be they are at best suggestive of how promotion affects consumption. Increasing product consumption is the goal of many marketers. It would be useful to examine the effect of marketing actions on both purchase *and* consumption behavior. We collectively refer to purchase (brand choice, purchase quantity, and purchase timing) and consumption behaviors (amount consumed per unit time) as brand behaviors.

In the reminder of this chapter we present the motivation for our study. First, we establish the importance of brand loyalty by showing the benefits of brand loyalty and its impact on firm performance and consumer behavior. Second, we point to the need for brand loyalty to be properly operationalized. Third, we present our research objectives and highlight the potential contributions of the study. The chapter concludes with a summary and a preview of the rest of the dissertation.

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[1] Brand equity refers to the market value or "net worth" of a brand. Brand loyalty enhances brand equity.

Motivation for the Study

The importance of brand loyalty

A basic tenet of the marketing concept is that it is the purpose of the firm to create and maintain satisfied customers (Nickels and Wood 1997). The importance of customer satisfaction cannot be trivialized; however, loyalty is a more certain leading indicator of profitability than satisfaction (Reichheld and Sasser 1990). Loyalty directly impacts the bottom line (Griffin 1995; Hallberg 1995; Reichheld with Teal 1996). Customers who do not remain loyal deprive the marketer of future profit-making potential (Reichheld and Sasser 1990). Brand loyalty is a necessary nutrient for brand health.

Hallberg (1995) points to two ways in which brand loyalty affects brand profitability. Firstly, brand loyalty influences the share of total category purchases consumers give to any particular brand. The brand with the largest franchise of loyal consumers should expect to enjoy the largest market share, ceteris paribus, as well as any incidental benefits that spring from being a market share leader. The relationship between brand loyalty and the proportion of purchases realized at the individual level translates to the observed relationship between brand loyalty and market share at the aggregate level. Using data on consumer purchase habits covering 1,000 brands in 86 product classes, Raj (1985) finds that brands with a larger share of users have proportionately larger fractions of loyal buyers. This points to the "double jeopardy" faced by small

market share brands: 1) they tend to have fewer buyers than high-share brands and 2) they tend to be bought less often, that is, there is less behavioral brand loyalty (Ehrenberg, Goodhardt, and Barwise 1990). Brand loyalty usually under-girds market dominance.

Secondly, Hallberg (1995) notes that brand loyalty also affects brand profitability because of the effect of loyalty on the price the marketer can charge for the brand. Brand loyal consumers are not as price sensitive as non-loyals in the brand choice decision (Krishnamurthi and Raj 1991). The relative price insensitivity of brand loyal consumers provides the marketer the possibility of extracting a price premium. A price premium generates additional revenue and may serve as a cue of better brand quality, which further enhances brand equity and consequently brand loyalty. By building up brand loyalty and equity and desensitizing consumers to price the marketer need not rely so heavily on price promotions and other sales promotion tactics. Increasing brand loyalty in the short term may lessen the need for marketing activity directed to the consumer in the medium- and long-term. The reduction in marketing activity and its associated cost clearly enhances profitability. Brand equity and loyalty for consumer packaged goods (and other types of goods) may best be built up with the use of advertising and other marketing efforts that focus more on brand attributes and image and less on price. Sales promotions draw attention to price.

According to Aaker (1992), there are five brand equity assets that are able to provide value to the firm. These assets are brand loyalty, brand name awareness, perceived brand quality, brand associations in addition to perceived quality, and other proprietary brand assets — e.g., patents, trademarks, and channel relationships. Brand loyalty provides value in the form of reduced marketing costs, greater trade leverage, enhanced ability to attract new customers as a result of brand awareness, and a sense of reassurance associated with the brand. Brand loyalty also affords the firm more time to respond to competitive threats.

The benefits of enhanced brand loyalty may not only come from less overall marketing but from more targeted marketing action directed specifically to brand loyal consumers. Little benefit may come from directing marketing efforts toward consumers who are perpetually brand disloyal. Clear evidence of brand loyalty serves as an effective basis for market segmentation. As Reichheld (1993, p. 66) matter-of-factly notes, "With knowledge of which customers are likely to be loyal comes knowledge of which customers are not." Consumers who demonstrate loyalty self-identify themselves as representing the core of the marketer's target market. The understanding that not all consumers are equally loyal is the fundamental premise that inspires "differential marketing" (Hallberg 1995). Brand loyalty gives the firm the opportunity and incentive to know its best customers well. The firm is best able to serve

those consumers whom it knows best. The benefits of brand loyalty are not uni-directional.

Brand loyalty is also beneficial from the point of view of consumer welfare. Consumers become loyal to a brand when they are convinced of the appropriateness of that brand for their needs and consequently develop and maintain a favorable attitude toward the brand. Brand loyalty represents the resolution of prior conflict. Brand loyal consumers are settled upon a choice and are satisfied and at peace with their decision. Energy devoted to tiresome brand search and evaluation may now be conserved and directed to other more enjoyable pursuits. Brand loyalty is beneficial to the customer in other ways. Aaker (1992) notes that brand loyalty provides value to the customer by enhancing the customer's interpretation or processing of information, boosting confidence in the purchase decision, and heightening use satisfaction.

Need for a proper operationalization of the brand loyalty concept

The benefits of brand loyalty we have just reviewed suggest that brand loyalty is an important concept from a managerial point of view. The sheer volume of work on brand loyalty in the academic literature is compelling testimony that brand loyalty is of significant interest to academics. The importance of the concept cannot be denied. However, empirical findings about brand loyalty and its relationship to other matters of interest must be viewed cautiously if the concept of brand

loyalty is not operationalized in a manner that is consistent with how it has been theorized.

Most of the recent studies that have looked at brand loyalty (e.g., Agrawal 1996; Mela, Gupta, and Lehmann 1997; Papatla and Krishnamurthi 1996; Yim and Kannan 1999) have only been able to consider loyalty from a behavioral perspective due to their reliance on scanner data. These studies make no provision for the moderating influence of attitudinal factors on brand behaviors. Consequently, much of the accumulated body of knowledge about the effect of brand loyalty on different types of consumer behaviors is subject to qualification. There is a dearth of attitudinal data in many of the recent empirical brand loyalty studies. This means that we are left to infer that the relationship between brand loyalty, measured from an attitudinal perspective, and consumer behavior is the same as that which is observed between brand loyalty, as measured from a behavioral perspective, and various types of consumer behaviors.

There is more to brand loyalty than repeat purchase behavior (Day 1969; Jacoby and Kyner 1973). Brand attitudes ought to be considered as well. By assessing brand attitudes we are able to discriminate between consumers who are truly brand loyal and those who are simply in a state of inertia and purchase the brand primarily for reasons other than affection. An important step toward having an unqualified understanding of the relationship between brand loyalty and brand behaviors is to

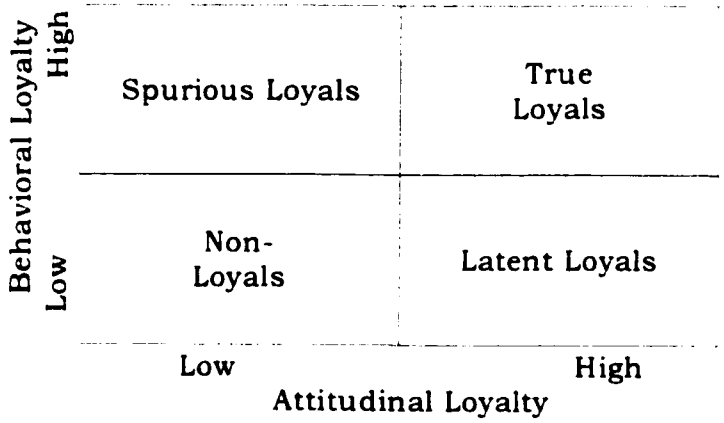
utilize an operationalization of the brand loyalty construct consistent with its theoretical outline. In this study we supplement scanner data with attitudinal survey data enabling us to operationalize the brand loyalty construct in a manner consistent with the conceptual view of the construct long espoused in the literature. In so doing we take that important step toward understanding brand loyalty's relationship (if any) to various brand behaviors.

Objectives and contributions of research

Day (1969) in his seminal article pointed out that brand loyalty has two dimensions: an attitudinal dimension and a behavioral dimension. In our study we have the opportunity to segment consumers in terms of these two dimensions of brand loyalty. Some researchers in their operationalization of brand loyalty have adopted an attitudinal perspective (e.g., Beatty, Kahle, and Homer 1988), whereas others have adopted a behavioral perspective (e.g., Grover and Srivasan 1992). Following previous literature, loyal and non-loyal consumers can be operationalzed on the basis of attitude or behavior. If you put these two dimensions together you have a framework similar to that presented by Dick and Basu (1994). Consumers may be classified as non-loyals, latent loyals, spurious loyals, or true loyals, as shown in Figure 1, given their level of loyalty with respect to the two dimensions of loyalty. The "true loyals" segment consists of consumers with high behavioral and attitudinal loyalty. "Latent loyals" have high attitudinal loyalty but evince

little behavioral loyalty. Consumers who are spuriously loyal have a high incidence of repeat purchase of the brand but are not attitudinally loyal. The type of loyalty exhibited by this segment is sometimes referred to as inertia. "Non-loyals" are neither attitudinal nor behavioral loyals. Fundamental to our research is the presupposition that consumers in the different quadrants (or cells) of the loyalty matrix have different sensitivities to marketing actions.

Figure 1
Loyalty Matrix



Source: Based on Dick and Basu (1994)

We want to know how consumers behave, in terms of their sensitivity to marketing actions, as a function of their brand loyalty. Given that a consumer is a non-loyal, spurious loyal, latent loyal or true loyal, we are interested in finding out how these different types of loyals are likely to react to different marketing actions.

Our study examines the behavior of consumers in the different cells and will examine the following research issues:

- What are the brand behaviors of different consumer segments, that is, consumers differentiated on the basis of their behavioral and attitudinal loyalties?

- What is the effect of marketing actions on the brand behaviors (i.e., brand choice, purchase timing, purchase quantity, and consumption rate) of different consumer segments? and

- What is the sensitivity of different consumer segments to various promotion actions in affecting their brand behaviors?

The contributions of this study relate directly to its objectives.

Specifically,

- By being able to operationalize attitudinal loyalty distinctly from behavioral loyalty and incorporating attitudinal and behavioral loyalty into a measure of two-dimensional brand loyalty we are able to determine more assuredly the relationship between brand loyalty and brand behaviors. This permits us to gain insights into *what happens* when brand loyalty is operationalized in one fashion as opposed to another. This study enables us to know how much the findings of key relationships between loyalty and response to the marketing mix are a function of if brand loyalty is operationalized based on attitude versus if brand loyalty is operationalized based on behavior.
- Examination of the sensitivity of different segments, as defined by the two dimensions of loyalty, to various promotional actions will enable managers to more efficiently and effectively tailor their promotional mix based on the composition of their target market and the desired response in both the short and long term.
- We add to the extant literature by showing how marketing actions (to the extent they are moderated by brand loyalty) affect both purchase behavior and consumption behaviors. Both practitioners and academics have an interest in the effect of strategic marketing actions on consumption. This would be of particular concern to managers if it were their immediate goal to increase product consumption.

Summary and Organization of Dissertation

This chapter highlighted the importance of brand loyalty and pointed to the benefits of brand loyalty from the point of view of brand performance and consumer welfare. We also outlined the research

questions that this study will seek to address and the potential contributions of our study.

The remainder of this dissertation is organized as follows: Chapter 2 presents a formal definition of brand loyalty and a review of select studies in the brand loyalty literature which enables us to position this study with respect to other studies. We demonstrate how our study differs from previous work. We also show how with the data that are available to us we are able to overcome some of the limitations of prior studies. In chapter 3 we review some differences in brand behavior between loyals and non-loyals, and look at theory that may explain differences between attitudinal and behavioral loyals. Chapter 4 presents the hypotheses to be tested in the study based on our literature review and in light of our research objectives. Chapter 5 describes the methodology employed and outlines how the hypotheses are tested. This chapter describes how we were able to get the data from the sample, the information provided with the scanner data to be used in the study, the operationalization of constructs, the information gathered in the survey instrument, and the statistical procedures to be used for hypothesis testing. Chapter 6 presents the results of our analysis. Lastly, chapter 7 presents the implications of our findings and discusses the limitations of our study.

CHAPTER 2

DEFINING BRAND LOYALTY AND POSITIONING OF STUDY

In this chapter we define the concept of brand loyalty, the concept central to our research. Our definition of brand loyalty draws attention to its attitudinal and behavioral dimensions. Also in this chapter we review exemplar studies from the brand loyalty literature and position our study relative to this literature. We show how our study has the potential to fill an important gap in the literature because of our ability to operationalize loyalty in attitudinal and behavioral terms. Our study is different from others that have gathered data on shoppers' attitudes in that we are not relying on self-report behavioral data but on scanner data. Scanner data, like any other type of data, are not without its defects; however, scanner data are perhaps the most accurate recording of behavioral data that are currently available to marketing researchers. Our study is unique from other studies not only in terms of the type of data on which the study is conducted but also in terms of the range of brand behaviors that are investigated.

Brand Loyalty Defined[2]

We define true brand loyalty is the synergistic union of attitudinal and behavioral brand loyalty. Our definition of brand loyalty draws

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[2] Our frequent use of the term "brand loyalty" is synonymous with what we define as "true brand loyalty." Other writers' use of the term "brand loyalty" generally refers to "true brand loyalty," however, depending on how brand loyalty was operationalized in a given study the results of that study may in their truest sense only relate to attitudinal or behavioral loyalty. When we refer to the works of other writers we will use the term "brand loyalty" in the sense it was used by the those authors.

directly from Jacoby (1971, p. 26) who states, "Brand loyal behavior is defined as the overt act of selective repeat purchasing based on evaluative psychological decision processes, while brand loyal attitudes are the underlying predispositions to behave in such a selective fashion."

Jacoby (1971, p. 26) goes on to state that "brand loyalty is essentially a relational phenomenon. It describes preferential behavior toward one or more alternatives out of a larger field containing competing alternatives. In other words, brand loyalty serves an *acceptance-rejection function* (our emphasis) — not only does it select-in certain brands, but it also selects-out certain others." True brand loyalty then is a distinct preference of a select few from a larger set coupled with the selective choosing of a select few from a larger set.

Our definition of brand loyalty is consistent with that of Day (1969), Jacoby and Chestnut (1978), and Dick and Basu (1994). Day (1969, p. 30) cautions that brand loyalty viewed solely in terms of purchase decisions may "not distinguish between true or 'intentional' loyalty and 'spurious' loyalty." In their treatise on brand loyalty Jacoby and Chestnut (1978) point out that brand loyalty is a function of evaluative processes, a reference to attitude formation. Dick and Basu (1994) conceptualized brand loyalty as the relationship between the consumer's relative attitude toward a brand and repeat purchase. The central thrust of these definitions is that brand loyalty is not the same as repeat purchase. Repeat purchase is a necessary, but non-sufficient,

condition of true brand loyalty (Jacoby 1971). True brand loyalty entails the bringing together of attitudinal and behavioral loyalty.

With true brand loyalty the nature of the relationship between attitude and behavior is synergistic. Behavioral loyalty is reinforced by attitudinal loyalty and attitudinal loyalty complements behavioral loyalty. The union of loyalty's two dimensions brings to life and accentuates the virtues of both types of brand loyalty. The perfect union of attitudinal and behavioral loyalty represents the highest form of brand loyalty. In reality brand loyalty often falls short of this lofty zenith. However, when both dimensions of loyalty are brought together it is then that we get our truest sense of the nature, extent, and magnitude of brand loyalty.

In their study Baldinger and Rubinson (1996) tracked the behavior of nearly 2,300 buyers of 27 brands in five product categories for a year. They found that buyers with stronger attitudinal commitment to the brand were more likely to remain loyal or become loyal compared to those with weaker attitudinal commitment. The authors identify two groups of consumers useful for understanding changes in market share, 1) "prospects" corresponding to latent loyals and 2) "vulnerables" corresponding to spurious loyals. They found that two-thirds of the brands studied showed an increase *(or decrease)* in year to year market share when the "prospects" to "vulnerables" ratio was favorable *(or unfavorable)*. This study points to the importance of understanding the nature (attitudinal vs. behavioral) of brand loyalty.

Review of Research Streams and Positioning of our Study

In this section we look at three streams of brand loyalty research. Studies in the first stream (e.g., Guest 1944) approach brand loyalty from an attitudinal perspective. The second stream (e.g., Grover and Srinivasan 1992) approaches brand loyalty from a behavioral perspective. Our decision to place a particular piece of research in either one of these streams is driven by how brand loyalty was operationalized in the given study. The third stream of research (e.g., Dillon and Gupta 1996) combines both behavior and attitude in examining brand loyalty. We label these three streams of research as the "A" (attitudinal perspective), "B" (behavioral perspective) and "C" (combined perspective) streams. We position our study relative to these various streams and show how this study contributes to existing literature as a result of our operationalization of brand loyalty and examination of brand behaviors.

Research in the "A" stream (Attitudinal perspective)

Guest (1944, 1955, 1964). Psychologist Lester Guest (1944, 1955, 1964) did some of the earliest research involving brand loyalty. Guest (1944, p. 17) defined brand loyalty as the "constancy of preference over a period of years in the life of the individual." Guest's "constancy of preference" idea is consistent with our notion of attitudinal loyalty. Over a twenty-year period, Guest tracked the brand preferences of a set of grade school children. Guest reported a 26% agreement for stated preferences and a 23% agreement for stated use by the same subjects

after a twenty-year span. The results suggest a high correspondence between stated brand preference and use and that brand loyalty can be very enduring. Apart from stated use there is no other examination of brand behaviors. His studies did not explore the role of marketing actions in influencing brand behaviors.

Jacoby (1971). Jacoby's (1971) brand loyalty study was conducted in a laboratory and involved 51 female consumers. Data were gathered on the subjects' attitudes, perceptions, and purchasing behavior with respect to several brands of a household product. Jacoby used Sherif, Sherif, and Nebergall's (1965) social judgment-involvement theory of attitudes to argue that consumers, when they consider brands in a product category, place them on a preference continuum and position the brands in regions of acceptance, neutrality and rejection. Jacoby finds that brand loyalty is a function of the distance between the regions and the proportion of brands in the rejection and acceptance regions. The effect of marketing actions and brand loyalty on brand behavior is not considered in Jacoby's study.

Beatty, Kahle and Homer (1988). Beginning in the late 1980s several researchers adopted the phrase "brand commitment" when referring to brand loyalty to highlight the attitudinal dimension of brand loyalty. The idea of commitment is synonymous with the idea of brand and product loyalty in the marketing context (Martin and Goodell 1991). Beatty, Kahle, and Homer (1988) present and develop an Involvement-

Commitment Model. The results of their study establish a relationship between ego involvement, purchase involvement, and brand commitment. They find that ego involvement influences purchase involvement, which in turn influences brand commitment. Beatty, Kahle, and Homer's study did not examine the role of marketing actions and loyalty in influencing brand behaviors.

Research in the "B" stream (Behavioral perspective)

Colombo and Morrison (1989). Colombo and Morrison (1989) develop a model to explain brand switching. A key assumption of their model is that there are only two classes of consumers, 1) Hard-Core Loyals and 2) Potential Switchers. The only kind of data needed to estimate the model is a brand-switching matrix. The model provides estimates of the proportion of consumers who are either Hard-Core Loyals or Potential Switchers. By observing trends in the proportion of consumers in a brand's franchise who are either Hard-Core Loyals or Potential Switchers one can gain insight into whether or not shifts in brand share are the result of increasing (or decreasing) brand loyalty or an improved (or lessened) ability to attract switchers. The model is designed for use at an aggregate level and not at the individual consumer level. The role of marketing actions in affecting brand behavior was not investigated in the Colombo and Morrison study.

Krishnamurthi and Raj (1991). In this study Krishnamurthi and Raj (1991) look at the differences in the price elasticity of loyals and non-

loyals in their brand choice and purchase quantity decisions. They find that in the choice decision non-loyals are more price sensitive than loyals but in the purchase quantity decision loyals are more price sensitive than non-loyals.

Grover and Srinivasan (1992). Grover and Srinivasan's (1992) study looked at how promotional actions affected brand shares (for loyal and switching segments), store shares (i.e., the proportion of sales in a product category accounted for by a particular store), and product category volume. An iterative Bayesian procedure was used to determine brand shares for the loyal and switching segments. The authors' model is applied to scanner panel data for ground caffeinated coffee. One interesting finding of Grover and Srinivasan's study is that consumers loyal to different brands respond to different marketing actions. For example, some brand loyal segments respond well to coupons offered by their preferred brand, significantly increasing brand share. But customers loyal to other brands were indifferent in their response to coupons offered by their preferred brand. The same pattern of behavior was evident with respect to other promotional actions.

Research in the "C" stream (Combined perspective)

Day (1969). Day's (1969) brand loyalty study is based on a five-month diary panel of 955 households. He stressed the need to consider brand attitudes in order to distinguish truly brand loyal consumers from those who are only spuriously brand loyal and develops a measure of

brand loyalty that incorporates both attitude and brand choice behavior. Day models brand loyalty as a function of several variables. These variables include a) socioeconomic and demographic variables, b) demand, price and store response variables, c) exposure to information variables, and d) determinants of "buying style" variables. In his regression model Day (1969, p. 34) finds that incorporating the attitudinal dimension into his brand loyalty measure (the dependent variable in his model) "contributed significantly to improving the explanation of individual variability in brand loyalty. In fact, without the improvements, the proportion of variability explained is insignificant."

Based on the results of the beta coefficients of his model Day (1969) advances a profile of the truly brand loyal buyer. This buyer is characterized as one conscious of the need to save money when buying, confident in his/her brand judgments, is a heavy buyer of the product, is under less pressure to satisfy the preferences of many family members, and is less influenced by day-to-day price fluctuations. Day stated that brand loyal buyers are committed to the value and price appeal of the brand by being confident that they have judged the brand correctly.

Bloemer and Kasper (1994, 1995). Bloemer and Kasper (1994, 1995) study the relationship between brand loyalty and customer satisfaction. They find that the amount of elaboration moderates the relationship between customer satisfaction and true brand loyalty. The greater the amount of elaboration the stronger the relationship between

true brand loyalty and customer satisfaction. Bloemer and Kasper operationalize true brand loyalty as the product of brand commitment (attitudinal loyalty) and repeat purchase behavior (i.e., commitment × repeat buying behavior). In their studies they model true loyalty (commitment × repeat buying behavior) as a function of satisfaction, involvement, and deliberation. Their studies do not examine the effect of brand loyalty and marketing actions on brand behaviors.

Dillon and Gupta (1996). Dillon and Gupta (1996) develop a model of consumer purchase behavior that decomposes a brand's sales into category volume and brand choice components. Their model was applied to data from a national survey of 2,500 households who were purchasers of jumbo paper towels. Both perceptions and behavioral information was gathered via the survey. The authors use latent class methods to segment consumers based on their brand perceptions and response to marketing mix variables.

The authors' found loyals to vary significantly in terms of their price sensitivity as reflected in the price coefficients in the category volume model. The price sensitivity of loyals was related to household characteristics, specifically, number of children and consumption level. Switchers differed primarily in the importance they gave to various brand attributes. For instance, paper towel strength was the dominant attribute for one switching segment. For other switching segments tissue absorbency and tearing ease were the critical attributes.

Baldinger and Rubinson (1996). Baldinger and Rubinson (1996) in their study looked at how brand attitudes are useful in predicting brand loyalty. Information on the behavior and attitudes of consumers with regard to 27 brands were gathered a year apart. Consumers were categorized as low-, moderate-, or high-loyals based on their probability of purchase. The authors found that high-loyal buyers of a brand for which they have consistent attitudes tend to remain loyal but those with inconsistent attitudes tend to switch away. They also find that low-loyal buyers with strong favorable attitudes toward the brand are much more likely to switch toward the brand. The results suggest that one's brand attitude is "the most important leading indicator of retention" (Baldinger and Rubinson 1996, p. 32). The authors did not examine how marketing actions impact brand behaviors.

Pritchard and Howard (1997). In their study Pritchard and Howard (1997) examine the loyalty of travelers to various "brands" of travel services. They employ a brand loyalty measure similar to that of Day (1969). Data on both attitude and behavior were collected via a survey. The results of their cluster analysis support a two-dimensional matrix of brand loyalty (similar to that in Figure 1). Through the use of discriminant analysis they were able to identify distinguishing characteristics of the truly loyal patron. The truly loyal patron is profiled to be "a highly satisfied, symbolically involved consumer drawn to those

services that exhibit an empathetic, caring concern for their patrons" (Pritchard and Howard 1997, p. 2).

Positioning of our research

Our review of select studies in the "A," "B" and "C" streams indicates that brand loyalty remains an active area of research. These studies may be characterized with respect to three attributes:

- Was brand loyalty operationalized in terms of its attitudinal and behavioral dimensions? Or was there a two-dimensional segmentation of consumers? That is, were consumers segmented in terms of their attitudes and behaviors?
- Was brand loyalty a predictor of brand behaviors?
- Were marketing actions used to predict brand behaviors?

As shown in Table 1, our research possesses all of these characteristics, which are shared in part by previous research. With behavioral and attitudinal data we can create and utilize a brand loyalty measure that is true to the conceptualization of brand loyalty explicated in the work of Dick and Basu (1994) and others. Our behavioral data, unlike that in the "C" stream, is scanner-based, not self-report. We also examine how four brand behaviors are affected by brand loyalty and marketing actions. The studies we have reviewed that have looked at how brand loyalty affects behavior have looked at most at two behaviors — brand choice and purchase quantity.

Studies in the "B" (behavioral) stream were limited to behavioral data, hence the insights gained from these studies are qualified by the fact that only one dimension of brand loyalty has been examined. As

shown in Table 1, none of the studies in the "A" (attitudinal) stream ventured into the issue of how marketer's actions affect brand behaviors. With the exception of Guest's work none of the studies in the "A" stream use brand loyalty as a predictor of brand behaviors. Guest (1964) reported that the average amount of agreement between the brand preferences expressed by subjects in his 1941 and 1961 studies was 26%. The average degree of agreement between 1941 brand preferences and 1961 stated brand use was 23%. This shows a fairly high level of correspondence between attitude and behavior over a twenty-year period.

Studies in the "A" stream by and large look at the relationship between brand loyalty and psychological constructs. They seek to see if there is a correspondence between one psychological construct (loyalty) and other psychological constructs (e.g., satisfaction, quality perceptions, and involvement). Studies in the "B" stream however by and large seek to examine the relationship between one type of behavior (brand loyal behavior) and other types of behavior (e.g., purchase quantity and timing). In our study we examine the correspondence between the attitudinal and behavioral dimensions of brand loyalty and behavior. This feature distinguishes this study from other empirical studies in the brand loyalty literature.

Summary

In this chapter we defined brand loyalty and position our study relative to other studies in the brand loyalty literature. We define true

brand loyalty as the synergistic union of attitudinal and behavioral brand loyalty. This definition of brand loyalty is consistent with the conceptualization of brand loyalty offered by Dick and Basu (1994) and others. We position our study relative to other brand loyalty in terms of our use of a two-dimensional operationalization of brand loyalty and by the use of brand loyalty and marketing actions as predictors of various types of behavior. As shown in Table 1, our operationalization of brand loyalty is only shared by studies in the "C" (combined perspective) stream. Furthermore, whereas other studies in the "C" stream rely on self-report data to gather behavioral data we are able to use scanner data that is not subject to the fallibilities of self-report data. Furthermore, we use brand loyalty and marketing actions as predictors of four types of brand behaviors. Marketing actions as a predictor of brand behaviors is not characteristic of studies in the "A" stream. Marketing actions as a predictor of behavior is characteristic of most studies in the "B" stream. Brand loyalty as a predictor of brand behaviors is not characteristic of several studies in the "A," "B" and "C" streams. Our study is the first (to the best of our knowledge) that looks at brand loyalty as a prediction of consumption rate.

In the next chapter we review literature that examines the relationship between brand loyalty and brand behaviors. We also look at theory that may account for differences in the sensitivity of different types of loyals to different marketing actions.

Table 1
Positioning of Studies

Study	Two-dimensional segmentation or operationalization of brand loyalty		Brand loyalty predictor of brand behaviors	Marketing actions predictor of brand behaviors
Attitudinal perspective: "A" stream research				
Guest (1944, 1955, 1964)			✓	
Jacoby (1971)				
Beatty, Kahle, and Homer (1988)				
Behavioral perspective: "B" stream research				
Colombo and Morrison (1989)				
Krishnamurthi and Raj (1991)			✓	✓
Grover and Srinivasan (1992)				✓
Combined perspective: "C" stream research	*How behavioral data collected?*			
	Self-report	*Scanner data*		
Day (1969)	✓			
Bloemer and Kasper (1994, 1995)	✓			
Dillon and Gupta (1996)	✓			✓
Baldinger and Rubinson (1996)	✓		✓	
Pritchard and Howard (1997)	✓			
This study		✓	✓	✓

CHAPTER 3

LITERATURE REVIEW

In this chapter we review literature dealing with the effect of marketing actions on brand behaviors and how consumers segmented on the basis of brand loyalty differ in these behaviors. We review differences in the sensitivity of loyal and non-loyal consumers to marketing actions. We look at the Elaboration Likelihood Model literature to understand how differences in the processing of persuasive communication may explain differences in consumers' sensitivities to marketing actions.

The Effect of Brand Loyalty and Marketing Actions on Brand Behaviors

As we have pointed out in chapter 2, studies in the "A" (attitudinal) stream of brand loyalty research examine relationships between the psychological construct of attitudinal brand loyalty and other psychological constructs. Studies in the "A" stream do not model the various brand behaviors that are of interest in this dissertation. Given the paucity of research in the "A" stream that examines behavior we draw on the other streams in this review. We review the relationship between brand loyalty, more specifically behavioral brand loyalty, and brand behaviors, beginning with brand choice.

Brand choice

By definition, true brand loyal consumers choose their preferred brand more than other brands. Truly brand loyal consumers have strong

positive attitudes toward their preferred brand and are relatively price insensitive in terms of brand choice (Krishnamurthi and Raj 1988). However, price insensitivity is not the litmus test of brand loyalty. Loyals who are heavy consumers or have high purchase volume are more price sensitive than light users (Dillon and Gupta 1996; Kim and Rossi 1994). East, Harris, Willson and Hammond (1995) conclude from a survey of British supermarket shoppers that household income is the demographic variable most strongly associated with claimed brand loyalty. These studies show that there are numerous variables related to brand loyalty.

The brand choice decisions of consumers, both loyals and non-loyals, are significantly affected by marketing actions. Marketers may seek to influence brand choice by featuring items in their promotions (also known as feature advertising). A featured item may be offered at a temporary price reduction but not necessarily so. Featuring an item may simply be the marketer's way of using a promotion signal to attract consumers' attention to the item. Inman, McAlister, and Hoyer (1990) find that shoppers often react to the presence of a promotion signal as they would to a price cut. That is, promotion signals are likely to spur brand choice with or without a concomitant price cut.

Promotion signals such as in-store displays and feature advertising not only affect choice behavior but also apparently affect how consumers think about product alternatives that constitute their consideration set. A study by Allenby and Ginter (1995) suggests that promotion signals

increase product net utility (increasing the probability of consumers choosing the promoted item) and decrease price sensitivity.

Grover and Srinivasan (1992) find that different loyal segments respond to different promotional variables.[3] Loyal consumers appear to respond most favorably to the promotional tactic employed by their preferred brand, be it coupons or features. This suggests that some brands may risk reducing their base of loyal buyers if they discontinue or significantly alter the promotion tactics loyal buyers have come to expect.

Most of the increase in sales as the result of sales promotion is the result of brand switching, that is, non-loyal choice behavior (Gupta 1988). However, the effect of price changes across brands is asymmetric. These asymmetric effects are evident in both the brand choice (Sivakumar 1995) and category choice decisions (Sivakumar and Raj 1997). Price decreases (increases) by top tier brands produce larger gains (smaller losses) for top tier brands vis-à-vis corresponding changes by lower tier brands in the brand choice decision and in converting category non-purchasers into purchasers. This suggests that top tier brands need not match the promotions of lower tier brands but use promotions to attract quality-sensitive, as opposed to price-sensitive, consumers.

Behavioral loyals and behavioral non-loyals respond asymmetrically to price increases and decreases in the brand choice

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[3] Grover and Srinivasan's (1992) study looked at choice behavior for coffee. Shoppers were segmented in terms of their loyalty to different brands of coffee and the type of coffee (drip, regular, or percolator).

decision. Krishnamurthi, Mazumdar, and Raj (1992) in their study of two frequently purchased products find that behavioral loyals show the same sensitivity to price increases and decreases. However, non-loyals were more sensitive to price decreases than they were to price increases.

Kahn and Louie (1990) in their experiments examined the choice behavior of last-purchase-loyal consumers and variety-seekers when price promotions are discontinued. They found that the effects of promotion on choice depended on 1) the extent to which subjects are variety seekers in the product category and 2) the pervasiveness of promotions in the category. Brand choice probability declined when price promotions were retracted in the context of a single brand being promoted and with subjects being loyal to the brand last purchased. The decline in choice probability was significantly diminished if the subjects were variety-seekers in the absence of promotions or when multiple brands were being promoted simultaneously. Kahn and Louie's study demonstrates the importance of considering the context under which price promotions are offered to determine their possible effect on loyal and non-loyal consumers.

Ortmeyer, Lattin, and Montgomery (1991) hypothesize that the effect of promotion on brand utility (which determines brand choice) is mediated by brand preference (their apparent term for attitudinal loyalty). They argue that the effect of promotion will be greatest when the consumer prefers multiple brands and weakest when there is preference

for a single brand. By extension, they hypothesize that a lagged promotional purchase should have a minimal effect on the brand choice of consumers with strong singular preferences. Ortmeyer et al. determine brand preference by considering the promotional conditions under which choice is made. Strongest preference for Brand *X* is indicated when Brand *X* is purchased at its regular price and competing brands are offered on promotion. Weakest preference is shown for Brand *X* when it is purchased on promotion and competing brands are offered at regular price. Intermediate/indeterminate preference is indicated for Brand *X* when it is purchased at a price compatible with other brands (which may be at regular or discounted prices). The study's results support the authors' hypothesis on the role of brand preference in affecting brand choice after controlling for other factors that affect brand choice including static and dynamic behavioral loyalty.

In sum, a review of the literature indicates that brand loyalty and marketing actions significantly affect brand choice. There is evidence that consumers who are loyal to different brands are more sensitive to certain types of marketing actions (Grover and Srinivasan 1992). Ortmeyer, Lattin, and Montgomery (1991) find that the effect of promotion on brand choice is weakest when the consumer evinces a preference for multiple brands. The effect of price is asymmetric in the brand and category decision (Sivakumar and Raj 1997) and loyals and non-loyals respond asymmetrically to price increases and decreases

(Krishnamurthi, Mazumdar, and Raj 1992). However, the effect of price on the choice behavior of loyals and non-loyals is conditional on the extent to which price promotions are pervasive in the product category. The literature indicates that there are a host of factors that one need to consider when assessing the relation of brand loyalty and marketing actions on brand choice.

Purchase quantity

In his study of toilet tissue purchases, Tellis (1988) finds behavioral brand loyalty to be a significant predictor of purchase quantity. Behavioral brand loyal consumers were found to purchase more of their preferred brands per purchase occasion. Behavioral brand loyalty was also found to interact with exposure to advertising to affect purchase quantity. Tellis concludes that advertising appears to reinforce buyer preferences rather than promote switching, which points to the possible role of advertising in building brand loyalty and equity.

The role of price in brand behaviors differs in the choice and purchase quantity decisions. In the quantity decision only the price of the chosen brand is considered, but in the choice decision the prices of all competitive brands are considered (Krishnamurthi and Raj 1988). Krishnamurthi and Raj (1991) find that behavioral loyal consumers are less price sensitive than behavioral non-loyals in the choice decision but more sensitive to price in the purchase quantity decision. Non-loyals have no compelling reason to stockpile a brand they dislike. Brand loyal

consumers on the other hand relish the opportunity to stockpile their preferred brand when it is offered on deal (i.e., at a discount).

Brand loyal consumers exhibit asymmetric responses to price changes in the purchase quantity decision depending on when the decision is made — before or after a stock-out[4] (Krishnamurthi, Mazumdar, and Raj 1992). If the purchase quantity decision is made after a stock-out, brand loyal buyers are more sensitive to a price decrease than to a price increase. On the other hand, if the decision is made prior to a stock-out, loyals are more responsive to a price increase than a decrease. Non-loyals were found to be more sensitive to price increases than price decreases regardless of household inventory level.

Brand loyal customers are not only more sensitive than non-loyals to price changes in their purchase quantity decisions but the lasting effect of promotion on loyals and non-loyals appear to differ. Grover and Srinivasan (1992) find that the overall promotional attractiveness of the product category has significant current and lagged effects on category volume and that the lagged effects resulting from consumer purchase acceleration last longer for loyals than for switchers.

In sum, a review of the literature suggests that loyals purchase more of the brands to which they are loyal (Krishnamurthi and Raj 1988, 1991; Tellis 1988). The literature also points to the asymmetric response of loyals to price in their purchase quantity decision, depending on if the

[4] A stock-out is an occasion when there is the absence of inventory.

purchase decision is made before of after a stock-out (Krishnamurthi, Mazumdar, and Raj 1992). Also, the impact of promotion in a product category on purchase quantity behavior lasts longer for loyals than for non-loyals (Grover and Srinivasan 1992). All in all, the literature points to differences between loyals and non-loyals in their purchase behavior and differences in the impact of marketing actions on their behavior.

Purchase timing

The literature that examines the effect of brand loyalty on purchase timing is not as voluminous as the brand choice and purchase quantity literature. Vilcassim and Jain (1991) find that the average inter-purchase time for repeat buying of saltine crackers is less than that for brand switching.[5] Kim and Rossi (1994), in their study of purchase behavior in the light canned tuna product category, find that consumers with high purchase frequency are much more price sensitive and have "more sharply defined preferences for national brands" (p. 57) than consumers with low purchase frequency. These findings suggest not only that heavy users are more price sensitive than light users but that brand loyal consumers tend to buy their preferred brand more frequently.

Marketing actions can prompt consumers to accelerate the timing of their purchases (Gupta 1988; Vilcassim and Jain 1991). Of course,

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[5] Inter-purchase time is the time between purchases. Inter-purchase time for repeat buying is the time between consequent purchases of the same brand (with no other intervening purchase). Inter-purchase time for brand switching is the elapsed time between purchase of one brand followed by the purchase of a different brand (with no intervening purchase).

marketing actions are not the only factor that affects purchase timing. In his study Gupta (1988) finds average inter-purchase time to be the most important predictor of purchase time. Many products are purchased on a routine basis (e.g., on every weekly shopping trip) and the effect of promotions on purchase timing may be muted in those instances. Also, the timing of the purchase of some products — so called unsought goods, for instance, emergency medical services (Nickels and Wood 1997) — may not be affected by promotions.

Accelerating the timing of one's purchases forces one to consider how much inventory of the product one has on hand. The motivation to accelerate purchase timing would be reduced in the presence of substantial inventory of the product unless the consumer desires or is capable of increasing his/her consumption of the product. Products that are usage invariant (Wansink 1996) may be relatively insensitive to promotions with respect to timing acceleration due to the potential adverse effects of accelerated consumption borne by the consumer. It is clear that many factors affect purchase timing of which promotion or brand loyalty may not be the most significant.

Vilcassim and Jain (1991) find that marketing mix variables (price and display) have a greater impact on the rate of brand switching than on repeat purchase for saltine crackers. Although promotion variables do shorten inter-purchase times, their effects are asymmetric. Promotions

greatly reduce inter-purchase time for switchers but not so for last-purchase-loyal buyers.

The effects of unobserved heterogeneity[o] on purchase timing are significant and affect the estimates of the effects of other covariates of purchase timing (Jain and Vilcassim 1991; Vilcassim and Jain 1991). Vilcassim and Jain (1991, p. 38) report that from 79-95% of the variation in repeat purchase rates is "left unexplained by the covariates — that is, 'explained' by the unobserved heterogeneity." It is likely that the unobserved heterogeneity captures among other things brand loyalty.

In sum, a review of the purchase timing literature indicates that marketing and household variables (including brand loyalty) are statistically significant predictors of purchase timing. However, these variables explain only a minute amount of the variation in purchase timing behavior. Purchase timing studies consistently point to the inability of the covariates in purchase timing models to explain most of the variation in purchase timing behavior (Gupta 1988; Jain and Vilcassim 1991; Vilcassim and Jain 1991). The literature suggests that loyals tend to buy their preferred brand more frequently (Kim and Rossi 1991; Vilcassim and Jain 1991), however, average inter-purchase time and level of inventory explain more of the variation in purchase timing than brand loyalty (Gupta 1988; Jain and Vilcassim 1991). Marketing actions have a greater impact on switchers than last-purchase-loyals

(Vilcassim and Jain 1991). There are differences between loyals and non-loyals in their purchase behavior and their response to marketing actions. However, the literature uniformly shows that purchase timing behavior is a behavior that is mostly unexplained by the covariates that we are able to include in purchase timing models.

Consumption rate

Although a fair amount of research has been done in the area of brand choice, purchase quantity, and purchase timing, the research on product consumption rates is very limited. Consumption rates point to how much of the product is consumed per unit time. Wansink and colleagues (Chandon and Wansink 1996; Wansink 1996; Wansink and Ray 1996) have looked at what marketing actions are able to affect consumption and how these marketing actions work to change levels of consumption. In these studies they have examined how marketing actions such as advertising, changes in package size, and sales promotion can increase product consumption and usage.

Chandon and Wansink (1996) find that stockpiling accelerates product consumption by increasing product inventory salience. They find that consumers have higher product consumption rates when they stockpile cookies and fruit juice. This was not the case when detergent was stockpiled. The lack of change in the consumption of detergent as a result of promotional stockpiling may be explained by the fact that

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[6] Unobserved heterogeneity refers to "variations across households that cannot be

detergent may be characterized as a usage invariant product or a product with little consumption flexibility (Chandon and Wansink 1996; Wansink 1996). That is, it is difficult to increase one's consumption of detergent by using it in place of other products; also, detergent is not likely to be consumed impulsively.

The work by Wansink and associates did not consider brand loyalty. We are not aware of any research that examines differences in consumption of different loyalty segments. There is evidence that certain marketing actions have the effect of increasing product consumption, but there has not been any study to see how these actions affect the consumption behavior of different loyalty segments. In this study we explore the consumption rates of different loyalty segments and look at how consumption is affected by marketing actions. With stagnant growth in numerous product categories, increasing product consumption among current users may in some instances be the most viable means of achieving sales growth.

In sum, the literature on consumption rate is only now beginning to develop. The extant literature shows that marketing actions are able to accelerate consumption. However, the ability of marketing action to accelerate consumption is very much a function of the extent to which the product possesses "consumption flexibility."[7] Our study is the first

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observed by the researcher" (Chintagunta 1993, p. 186).

[7] Products high in "consumption flexibility" tend to be used impulsively and in a variety of situations. Increased product consumption poses minimal risk to the user.

study that, to the best of our knowledge, examines differences in consumption rates between different types of loyals.

The Elaboration Likelihood Model: Why Attitudinal and Behavioral Loyals may respond differently to Marketing Actions

In this section we look at the Elaboration Likelihood Model developed by Petty and Cacioppo (1986), which we believe provides us with a theoretical basis that may be useful for explaining differences between different types of loyals in their sensitivity to the marketing variables of price and coupons. The central premise of our research is that there are differences in the sensitivity of different segments of loyals to marketing variables. We first point to the need to venture beyond the brand loyalty literature in order to find theory that may be useful to account for differences in the sensitivity of different types of loyals to marketing actions. We then point to how the Elaboration Likelihood Model may be used to account for these differences.

The need to look beyond the "A," "B," and "C" streams

As we have shown in Table 1 and elaborated on in Chapter 2, where we positioned our study relative other studies in the brand loyalty literature, this study is unique in several respects. Our study is different from studies in the "A" (attitudinal) stream in that we examine the behaviors of consumers. Studies in the "A" stream focus on the relationship of the psychological construct of attitudinal brand loyalty with other psychological constructs. The behavior of loyals, or differences

between the behavior of loyals and non-loyals is not central to research in the "A" stream. Research in the "A" stream does not examine the effect of marketing actions on the behavior of loyals and non-loyals. A central premise of our research is that there are differences between different types of loyals in their response to marketing actions. Research in the "A" stream does not broach the issue of how loyalty makes a difference in consumers' response to marketing actions.

Our study is similar to studies in the "B" (behavioral) stream in that we use scanner data. Research in this stream of the literature provides evidence of differences in the sensitivity of behavioral loyals and non-loyals to marketing actions. The theoretical emphasis of studies in the "B" stream (e.g., Krishnamurthi, Mazumdar, and Raj 1992; Tellis 1988) is not on the differences in sensitivity to marketing actions between loyals and non-loyals but on issues such as acquisition and transaction utility and the effects of message repetition. The literature in the "B" stream provides abundant evidence for differences between the sensitivity of behavioral loyals and non-loyals to marketing actions. However, the strength of these works lie more in their methodological sophistication than in their theoretical advances. Research in the "B" stream does little in the way of providing theory that accounts for differences in the sensitivity of different types of loyals to different types of marketing actions.

Research in the "C" (combined perspective) stream like our study has the benefit of being able to utilize attitudinal and behavioral data. However, this literature does not give us much in the way of theory that accounts for differences in sensitivity to marketing actions between different loyalty segments. As shown in Table 1, the Dillon and Gupta (1996) study is the only study in the "C" stream of brand loyalty research that has marketing actions as a predictor of brand behavior. The marketing variable in the Dillon and Gupta (1996) study was price. The other studies in the "C" stream (Baldinger and Rubinson 1996; Bloemer and Kasper 1994, 1995; Day 1969; Pritchard and Howard 1997) do not have marketing actions as a predictor of brand behaviors. These studies do not offer theoretical guidance for expecting differences between the sensitivity of different types of loyals to marketing actions.

Given our inability to draw theoretical guidance from the "A," "B" and "C" streams to explain the sensitivity of loyalty segments to marketing actions we look to the Elaboration Likelihood Model to account for the differences.

The Theory of the Elaboration Likelihood Model

Petty and Cacioppo's (1986) Elaboration Likelihood Model (ELM) of persuasion suggests two ways by which attitudes are changed: either the central or the peripheral route. Attitude change in response to persuasive communication via the central route occurs upon careful consideration (or elaboration) of relevant information perceived to be central to the

merits of the attitudinal position. Attitude change via the peripheral route occurs when the attitudinal object is associated with simple positive or negative cues in the persuasion context.

In pointing to how the ELM may be used to explain why different types of loyals respond differently to marketing actions we first position the marketing variables of price and coupons as vehicles of communication. We then point to two factors (involvement and need for cognition) that have an impact on the likelihood of elaboration of persuasive communication.

Deals: A method of communication and persuasion. The marketing actions of price changes/price promotions (i.e., offering items on deal) and coupon issuance are common sales promotion tactics. Sales promotion and other promotion activities (e.g., advertising and publicity) constitute a brand's integrated marketing communication efforts (Bagozzi, Rosa, Celly and Coronel 1998; Nickels and Wood 1997). Price changes and coupons are both instruments of communication. Price is an expression of value and a coupon provides an opportunity for the coupon-user to obtain a better value on their purchase than the non-coupon user. Both marketing variables are meant to persuade the consumer to pursue a particular line of action — brand choice and purchase.

Marketers employ marketing actions such as price changes and issuing coupons with the expectation that these actions will stimulate

favorable brand behaviors. There is little argument on the question of whether these marketing actions do have an effect. The more pertinent question is to the extent to which these marketing actions differentially affect the brand behaviors of different classes of consumers. For us the question is this: to what extent will these marketing actions differentially affect consumers with different types of loyalty?

Blattberg and Neslin (1990, p. 66) have defined deal-proneness as "the degree to which the consumer is influenced by sales promotion, in terms of behaviors such as purchase timing, brand choice, purchase quantity, category consumption, store choice, or search behavior." Consumers differ to the extent that they are deal-prone. One benefit of strong brand equity and loyalty from the point of view of marketers is that strong brand equity and loyalty provides the marketer with the opportunity to charge a premium price and rely less on sales promotion (Aaker 1992; Hallberg 1995). Marketers desire for consumers to be more brand loyal and less deal-prone (at least with regard to their brands).

Factors affecting elaboration likelihood: 1) Involvement. The extent to which a person will process a persuasive communication is conditional on that person's motivation (Eagly and Chaiken 1993; Petty and Cacioppo 1986). A person will be highly motivated to engage in deliberate processing of the communication if the communication is perceived to have personal meaning, intrinsic importance, or significant consequences. The higher the level of involvement the greater the

likelihood of elaboration. The more involved the shopper is involved in the product category the greater the motivation to thoughtfully and deliberately consider information (including price information) with respect to the product category. Consequently, shoppers that are highly involved in a product category will not be as influenced by peripheral cues (coupons in this context) relative to low involvement shoppers in the product category.

Inman, McAlister and Hoyer (1990) conducted an experiment that examined the effectiveness of promotion signals (a peripheral cue). The experiment was conducted in three product categories — peanut butter, toilet paper and toothpaste. Category involvement was measured with respect to these three categories. Inman et al. found that promotion signals had their strongest impact in changing choice likelihood in the least involving product category (toilet paper). Promotion signals were least effective in the product category with the highest level of product involvement (toothpaste). This finding suggests that consumers with limited involvement are more influenced by peripheral cues than those with greater involvement.

LeClerc and Little (1997) find that attractive pictures (peripheral cues) have a positive effect on coupon efficiency for product categories generating low levels of involvement.[8] This finding again suggests that consumers with limited involvement are more influenced by peripheral

cues than those with greater involvement. Hence, it may be expected that marketing communication actions that may be viewed as peripheral cues (e.g. coupons) may be more effective in affecting the behavior of low involvement consumers.

Beatty, Kahle, and Homer (1988) developed and tested an involvement-commitment model. They defined brand commitment as "an emotional or psychological attachment to a brand within a product class ... [it] is similar to the construct of brand loyalty" (p. 151). The idea of "emotional or psychological attachment to a brand" very much speaks to the notion of attitudinal loyalty. From the results of their study Beatty et al. (1988) conclude that ego involvement influences purchase involvement, which in turn influences brand commitment. Beatty et al.'s work suggests a strong relationship between involvement and attitudinal loyalty. Marketing actions that are effective toward high involvement consumers may be similarly effective toward attitudinal loyal consumers.

Brand loyal behavior is a biased behavior reflected in the selective repeat purchase of the same brand or brands (Jacoby and Chestnut 1978). Variety-seeking behavior, on the other hand, is "the biased behavioral response by some decision making unit to a specific item relative to previous responses within the same behavioral category, due to the utility inherent in variation per se, independent of the instrumental or functional value of the alternatives or items" (Van Trijp

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[8] Coupon efficiency is the proportion of coupon redemption that represents incremental

1995, p. 9). Brand loyal behavior is characterized by behavioral consistency; variety-seeking behavior is characterized by behavioral inconsistency. Van Trijp, Hoyer and Inman (1996) find that shoppers low in involvement are more likely to engage in variety seeking behavior. This finding suggests that highly involved shoppers are likely to be predisposed toward exhibiting selective brand loyal behaviors. Attitudinal loyalty is the underlying predisposition to behave in a selective fashion (Jacoby 1971).

Factors affecting elaboration likelihood: 2) Need for cognition. Another factor that influences a person's motivation to process persuasive communication is need for cognition. Individuals with a high need for cognition are more intrinsically motivated to engage in cognitive endeavors and are more likely to follow the central (vs. the peripheral) route to persuasion (Cacioppo and Petty 1982). Inman, McAlister, and Hoyer (1990) find that consumers with low need for cognition react to the simple presence of a promotion signal whether or not the price of the promoted brand is lowered. However, consumers with a high need for cognition reacted to a promotion signal only when there was a concurrent substantive price reduction. Low need for cognition consumers regarded the promotion signal as a cue of a price reduction. Those with a high need for cognition expended the additional cognitive resources to ascertain the legitimacy of the promotion signal.

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sales. Coupon efficiency is an important measure of coupon effectiveness.

Individuals who are more involved in the product category are more likely to expend additional cognitive effort processing marketing communications with regard to the product category. Marketing communications would be inclusive of price signage, coupons, and promotion signals. Shoppers with a high need for cognition would be very discriminating of marketing communications and will not simply or mindlessly respond to promotion signals. Therefore, shoppers with a high need for cognition will be very discerning of price changes.

In their study Inman, McAlister, and Hoyer (1990) show that shoppers with a low need for cognition are not particularly discerning of price information in that they react to the simple presence of a promotion signal irrespective of if there was price reduction on the promoted item. The promotion signal (a 4" × 7" sign in front of the brand display) worked effectively as a peripheral cue, which subjects in Inman et al.'s experiment took to be an indicator that there was a price reduction.

Inman, McAlister and Hoyer's (1990) experiment was conducted in three product categories — peanut butter, toilet paper and toothpaste. In their experiment they measured the subjects' attitudinal brand loyalty by asking subjects to register their brand preferences on a 100-point constant sum scale. Inman et al. found that the promotion signal had its strongest impact in changing choice likelihood in the product category where there was the lowest amount of attitudinal brand loyalty (toilet paper). The promotion signal had its weakest impact in the product

category with the highest level of attitudinal brand loyalty (toothpaste). The results of the Inman et al. study show that promotion signals are most effective with shoppers with a low need for cognition and where attitudinal loyalty and category involvement is low. Conversely, promotion signals are least effective with shoppers with a high need for cognition and where attitudinal loyalty and category involvement is high.

Jacoby (1971) found that shoppers who were more perceptive of quality differences in the product category were more attitudinally loyal. Perceiving differences in quality across alternatives in a product category is the outcome of elaborate and discriminating cognitive activity. Attitudinal loyalty is also the outcome of elaborate and discriminating cognitive activity. Van Trijp, Hoyer and Inman (1996) find that shoppers who perceive small differences between brands are more likely to engage in variety seeking behavior (the converse of brand loyal behavior). Significant quality differences between brands — particularly in an age of "quality equality" (Berry 1996) — are unlikely to be detected unless there is the devotion and application of significant cognitive resources.

Inman, McAlister and Hoyer (1990) found a significant and positive correlation between need for cognition and market maven tendency. Market mavens are "individuals who have information about many kinds of products, places to shop, and other facets of markets, and initiate discussions with consumers and respond to requests from consumers for market information (Feick and Price 1987, p. 855). Market mavens

actively scan the marketplace for relative prices, pricing practices and pricing patterns and serve as "price vigilantes" (Inman, McAlister and Hoyer 1990). A market maven pays very close attention to price information and would not be as susceptible to promotion signals. Shoppers with a high need for cognition tend to possess market maven tendencies and rely highly on cognitions in the buying decision making process. Attitudinal loyalty is the outcome of cognitive evaluations. Attitudinal loyals in a given product category are likely to be category mavens.[9] High attitudinal loyalty is the outcome of rigorous cognitive evaluation with respect to the product category. Category mavens would be very knowledgeable about the product category. We would conjecture that there would be a positive and significant correlation between attitudinal loyalty within the product category and category mavenism.

Because attitudinal loyalty is a function of cognitive processes (Jacoby and Chestnut 1978) we would except attitudinal loyals to have more category mavenism and would be very discerning of and relatively sensitive to price information and price changes in the product category. Attitudinal loyalty is the outcome of cognitive processes, therefore, it seems reasonable to assume that these types of loyals will have greater category maven tendencies than shoppers whose loyalty is not the outcome of cognitive processes (i.e., behavioral loyals). Behavioral loyals

[9] Category mavens are very knowledgeable about a specific product category. Category mavenism is market mavenism particularized to a specific product category.

will not be as discerning of price changes as attitudinal loyals. Hence, behavioral loyals should be less price sensitive than attitudinal loyals.

Coupons entitle shoppers to a price reduction. On some occasions the price reduction may be substantial. On other occasions the price reduction may be rather small. Coupons serve as a promotion signal. Shoppers who are not well informed about prices in the product category or who are not inclined to devote cognitive resources to evaluating pricing information in the product category are more likely to be susceptible to coupons. Behavioral loyals, whose loyalty is not the outcome of cognitive processes, are expected to be more susceptible than attitudinal loyals to coupons. Attitudinal loyals are expected to have more category mavenism and behavioral loyals are expected to have less category mavenism. More category mavenism would be suggestive of less susceptibility to coupons. Less category mavenism would be suggestive of greater susceptibility to coupons. Coupons serve as a promotion signal. Category mavens because of the depth of their category knowledge would not be as susceptible to promotion signals as those with less knowledge in the product category.

Summary

In this chapter we have advanced a definition of brand loyalty that draws attention to the behavioral and attitudinal dimensions of brand loyalty. We also reviewed literature on how brand loyalty relates to various brand behaviors and noted the need for more research on how

brand loyalty impacts purchase timing and brand consumption in particular. The literature that shows differences in the behavior of loyals and non-loyals belong to the "B" stream of research. These studies indicate that loyals respond differently than non-loyals to marketing actions. However, there are a host of factors to consider (e.g., the extent to which sales promotion is pervasive in the category and whether or not the purchase behavior occurs before or after a stock-out) in order to determine how loyals and non-loyals will respond.

In this chapter we looked at the Elaboration Likelihood Model which was used to explain probable differences between attitudinal and behavioral loyals in their response to marketing actions. We view marketing actions as vehicles of communication and persuasion. Attitudinal loyalty is the outcome of cognitive processing; behavioral loyalty is not the outcome of cognitive processing. This gives us reason to believe that attitudinal and behavioral loyals will response differently to prices and coupons. In sum we believe that attitudinal loyals will be more price sensitive than behavioral loyals and that behavioral loyals will be more coupon sensitive than attitudinal loyals.

In the next chapter we formally advance hypotheses and the supporting rationale on the relationship between brand loyalty and the various forms of brand behavior.

CHAPTER 4

HYPOTHESES

In this chapter we offer hypotheses that relate to our research questions regarding the brand behaviors of different types of loyals and the response of different types of loyals to various marketing actions. The current research is the first (to the best of our knowledge) that addresses this issue in terms of Dick and Basu's (1994) loyalty matrix. As we have pointed out in chapter 2, our research examines behavior (specifically consumption rate behavior) that has not been addressed in prior research. Consequently, our undertaking here is somewhat exploratory.

Our hypotheses have their theoretical underpinning in Petty and Cacioppo's (1986) Elaboration Likelihood Model. As we have discussed in the preceding chapter, because attitudinal brand loyalty is the outcome of cognitive processes (while behavioral loyalty is not), we expect differences in how these different types of loyals will respond to marketing actions. Differences between attitudinal and behavioral loyals in their response to persuasive communication would manifest itself in differences in their sensitivity to various marketing actions. We first put forward propositions about the general relationship between types of loyalty and sensitivity to marketing actions and then advance specific hypotheses dealing with the relationship between loyalty and four brand behaviors: choice, purchase quantity, purchase timing, and consumption rate.

The General Relationship between type of Loyalty and Sensitivity to Marketing Actions

The marketing actions of price changes and coupon issuance may be regarded as communication efforts on the part of marketers to persuade consumers to engage in various types of brand behaviors. We argued in chapter 3 that attitudinal loyals would be relatively more price sensitive than behavioral loyals. Attitudinal loyalty is the outcome of cognitive processes. Category mavenism is also the outcome of cognitive processes. Category mavens are very knowledgeable about the product category and are likely to be highly involved in the product category. Attitudinal loyals are expected to have a higher level of category mavenism than behavioral loyals. The high level of category mavenism will result in attitudinal loyals being very discriminating with respect to which marketing actions they respond to and relatively price sensitive.

The findings of Jacoby's (1971) study suggest that shoppers who perceive greater quality differences between brands are more attitudinally loyal. Perception of quality differences between brands may be expected to increase with category knowledge. A study by Inman, McAlister, and Hoyer (1990) found that promotion signals were more effective in product categories characterized by lower levels of attitudinal brand loyalty and category involvement. Shoppers highly involved with a product category will be very knowledgeable about that product category. These studies

suggest that promotion signals are likely to be less effective with shoppers with great category knowledge.

Attitudinal loyalty is the outcome of cognitive processing and a function of psychological processes (Jacoby and Chestnut 1978). Category mavenism is also the outcome of cognitive processing. We expect attitudinal loyals to have more category mavenism, that is, we expect attitudinal loyals to be relatively knowledgeable about the product category. Hence, attitudinal loyals are more likely to be able to detect and ascertain if a promotion signal is indicative of a legitimate price discount. Shoppers whose loyalty is not associated with category knowledge (behavioral loyals) may be more prone to making the assumption that a promotion signal is equivalent to the presence of a price discount. Behavioral loyals will be very sensitive to promotion signals; attitudinal loyals will be less sensitive to promotion signals.

Attitudinal loyals are expected to have more category maven tendencies. They will be more knowledgeable of prices in the product category and will be more sensitive to price changes. Attitudinal loyals will be more price sensitive. Coupons serve as promotion signals. Attitudinal loyals will be very discriminating in which coupons they will use. Behavioral loyalty is not associated with category knowledge and behavioral loyals are not as likely to be as discriminating in their coupon use. Behavioral loyals will be more coupon sensitive than attitudinal loyals. We put forward the following general propositions:

P1: Attitudinal loyals are more price sensitive than behavioral loyals in their brand behaviors.

P2: Behavioral loyals are more coupon sensitive than attitudinal loyals in their brand behaviors.

True brand loyalty has been defined as the union of attitudinal and behavioral brand loyalty. The bringing together of attitudinal and behavioral loyalty makes for true loyalty. We have proposed that attitudinal loyals are more price sensitive than behavioral loyals. We also proposed that behavioral loyals are more coupon sensitive than attitudinal loyals. To the best of our knowledge, the effect of the interaction of the dimensions of loyalty on purchase and consumption behavior has not been examined in the literature. Attitudinal and behavioral loyalty has an effect on brand behavior and sensitivity to marketing actions. Likewise we believe that true loyalty has an effect on brand behavior and sensitivity to marketing actions. It is an open question as to the nature and the direction of this effect. The effect of true brand loyalty might be weak in some product categories but potent in others. In some product categories true brand loyalty might have the effect of dampening sensitivity to marketing actions. In other instances true brand loyalty might heighten sensitivity to marketing actions. We know neither the nature nor direction of the effect of true loyalty on brand behavior and sensitivity to marketing actions and view this issue as a research question that needs to be studied. The following research propositions are advanced:

P3: True brand loyalty has an effect on shopper's brand behavior.

P4: True brand loyalty has an effect on shoppers' sensitivity to marketing actions.

In the following section we advance our hypotheses.

Hypotheses

We advance hypotheses with respect to the brand behaviors of brand choice, purchase quantity, purchase timing, and consumption rate. These hypotheses flow from the propositions that have been advanced. The first series of hypotheses deal with brand choice.

Choice behavior

In the choice decision, shoppers may be expected to be less price sensitive to the item to which they are loyal. The more loyal the shopper is the less price sensitive the shopper may be expected to be. Several studies (e.g., Krishnamurthi and Raj 1991; Krishnamurthi, Mazumdar, and Raj 1992) have shown that shoppers are less price sensitive to the brand to which they are behaviorally loyal to. We believe the findings that have been made with respect to the behavioral dimension of loyalty will also hold true with the attitudinal dimension of loyalty. The following hypotheses are advanced:

H1: In the choice decision, shoppers will be less price sensitive to items to which they are attitudinally loyal.

H2: In the choice decision, shoppers will be less price sensitive to items to which they are behaviorally loyal.

The extant literature provides support for H2. If H2 is supported in this study then our findings will be consistent with the literature. If

support is found for H2 but no support is found for H1 this would suggest that attitudinal loyalty is a non-issue with respect to price sensitivity in the brand choice decision. Such a finding implies that measuring loyalty solely in behavioral terms would suffice. It would mean that no benefit is to be had by seeking to understand brand attitudes because with respect to their price sensitivity in the choice decision the only dimension of brand loyalty that ultimately matters is the behavioral dimension. These two different hypothesis, if they are supported, point to the need to understand and measure both dimensions of brand loyalty.

Stemming from H1 and H2, we also hypothesize that shoppers will be least price sensitive to the brands to which they are both attitudinally and behaviorally loyal. The combination of attitudinal and behavioral loyalty produces true loyalty. We hypothesize that shoppers will be least price sensitive to the brands to which they are truly loyal. This degree of price insensitivity will be above and beyond the price insensitivity that is a function of the attitudinal and behavioral loyalty that the shopper has toward the brand. The following hypothesis is advanced:

H3: Shoppers will be least price sensitive to brands to which they are truly loyal in their brand choice decisions.

Support for this hypothesis would show the benefit of understanding brand loyalty and different types of loyals in terms of Dick and Basu's (1994) brand loyalty matrix as shown in Figure 1. Support for H3 would suggest that shoppers should be segmented not simply in

terms of loyals vs. non-loyals but by giving attention to how the two dimensions of brand loyalty relate to each other.

The first three hypotheses deal with shoppers' loyalty toward the brand (or brand-specific loyalty). The remaining hypotheses in the dissertation deal with brand loyalty in a more global sense, that is, the depth of brand loyalty in a product category. We will refer to this as category brand loyalty.[10] Hence, in terms of the brand loyalty matrix of Figure 1, a latent shopper would be a shopper that has high attitudinal loyalty in the product category but low behavioral loyalty. A spurious shopper would be one with low attitudinal loyalty but high behavioral loyalty. A shopper with relatively high attitudinal loyalty in the product category is one who rejects a relatively high proportion of brands in the product category and accepts a relatively small proportion of brands in the product category. The converse would be truly of a shopper with low attitudinal loyalty in the product category. Shoppers with relatively high behavioral loyalty in the product category concentrate their purchases in relatively few brands. The converse would be true for shoppers with relatively low behavioral loyalty.

The final brand choice hypothesis deals with category brand loyalty and flows from our propositions. The following hypothesis is advanced:

H4: In their choice decisions latent loyals will be more price sensitive than spurious loyals.

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[10] Throughout this dissertation the use of term "category brand loyalty" refers to the depth of brand loyalty in the product category. This is not the same as loyalty to the product category or loyalty to a specific brand in the product category.

H4 flows from our first proposition, P1. According to P1, attitudinal loyals are more price sensitive than behavioral loyals. With latents and spurious loyals we have two loyalty segments that may be considered extreme groups with respect to the two dimensions of loyalty. Latents have high attitudinal loyalty and low behavioral loyalty. Spurious loyals have high behavioral loyalty but low attitudinal loyalty. These two groups provide a stark contrast between groups that differ in the two dimensions of brand loyalty. Latent loyals are high in attitudinal loyalty and are expected to be relatively price sensitive. Spurious loyals who are low in attitudinal loyalty are expected to be less price sensitive. H4 draws attention to these differences.

We make no formal prediction and hypothesis as to the price sensitivity of true loyals. In P3 and P4 we proposed that true loyalty has an effect on brand behavior and sensitivity to marketing actions. However we hasten to add and are careful to note that we are uncertain as to the nature and direction of this effect. This is an open research question. We will examine the choice behavior and price sensitivity of all segments but limit our choice hypotheses to that which have already been advanced.

Purchase quantity

Our purchase quantity hypotheses deal with brand loyalty at the category level. These hypotheses flow from the propositions that have been developed earlier in this chapter. The following hypotheses with

respect to purchase quantity, brand loyalty, price and coupon sensitivity are advanced:

H5: In the main, attitudinal loyals are more price sensitive than behavioral loyals in the purchase quantity decision.

H6: In the main, behavioral loyals are more coupon sensitive than attitudinal loyals in the purchase quantity decision.

H5 is based on P1. P1 states that attitudinal loyals will be more price sensitive than behavioral loyals in their brand behaviors. Attitudinal loyals are expected to be more price sensitive because we expect these types of loyals to have more category maven tendencies and to be more discriminating of price information. H6 is based on P2. P2 states that behavioral loyals will be more coupon sensitive than attitudinal loyals in their brand behaviors. Behavioral loyals are expected to be more coupon sensitive because we expect these types of loyals to be more susceptible to promotion signals. Behavioral loyalty is not the outcome of cognitive processing and behavioral loyals are not expected to be high in category mavenism, which is the outcome of cognitive processing. Category mavens are expected to be highly involved in the product category and have relatively strong attitudinal loyalty given the depth of their category knowledge. We do not expect them to be easily swayed by promotion signals. Coupons may be viewed as promotion signals and promotion signals have been found to be more effective in those product categories characterized by low levels of involvement and

attitudinal brand loyalty (Inman, McAlister, and Hoyer 1990). These arguments and this finding serve as the rationale for H5 and H6.

We proposed in P3 and P4 that true brand loyalty has an effect on brand behavior and sensitivity to marketing actions. Unknown is the nature or direction of these effects and no formal hypotheses are advanced. However, we will examine what is the effect of true brand loyalty on price and coupon sensitivity and purchase quantity behavior.

Purchase timing

The following hypotheses with respect to purchase timing, brand loyalty, price and coupon sensitivity are advanced:

H7: In the main, attitudinal loyals are more price sensitive than behavioral loyals in the purchase timing decision.

H8: In the main, behavioral loyals are more coupon sensitive than attitudinal loyals in the purchase timing decision.

Apart from the fact that H7 and H8 relate to the brand behavior of purchase timing and H5 and H6 relate to the brand behavior of purchase quantity the current set of hypotheses, H7 and H8 are identical to H6 and H7. Both sets of hypotheses stem from the same propositions, P1 and P2, which puts forward the relationship between types of loyalty and sensitivity to marketing actions. H7 and H8 are the particularization of P1 and P2 to purchase timing. Earlier in this chapter we elaborated on the theoretical rationale supporting the propositions and how the propositions may be extended to the behaviors of brand choice and purchase quantity with respect to price and coupon sensitivity. The same

arguments used in those instances when particularized to purchase timing provide the theoretical rationale for our purchase timing hypotheses, H7 and H8. We advance no formal hypothesis on the effect of true loyalty in the context of purchase timing behavior but intend to examine its effect. Next we present our final set of hypotheses.

Consumption rate

The following set of hypotheses dealing with consumption rate behavior, brand loyalty, price and coupon sensitivity are advanced:

H9: In the main, attitudinal loyals are more price sensitive than behavioral loyals in their consumption rate behavior.

H10: In the main, behavioral loyals are more coupon sensitive than attitudinal loyals in their consumption rate behavior.

These hypotheses flow directly from the propositions that were put forward and developed earlier in this chapter. This set of hypotheses follows in the same pattern as those hypotheses dealing with the brand behaviors of purchase quantity and purchase timing. The same rationale, arguments and logic used for brand choice, purchase quantity and purchase timing when applied and particularized to consumption rate behavior provide the theoretical basis for H9 and H10. The rationale for our propositions and how they may be particularized to brand behaviors have been thoroughly ventilated earlier in this chapter. As was the case with the other brand behaviors, we advance no hypotheses on the effect of true brand loyalty on consumption rate behavior and sensitivity to

marketing actions. However, we do intend to examine the effect of true brand loyalty in the context of consumption rate behavior.

Summary

In this chapter we advanced hypotheses with regard to the relationship between brand loyalty and brand behaviors. Our hypotheses are the particularization of propositions that were advanced with respect to the relationship between the dimensions of loyalty and sensitivity to marketing actions. Our propositions have their theoretical foundation in Petty and Cacioppo's (1986) Elaboration Likelihood Model. The Elaboration Likelihood Model suggests how individuals with different degrees of involvement and need for cognition are likely to process persuasive communications. Pricing and couponing activity on the part of marketers may be viewed as vehicles and instruments of communication. The differences in shoppers' involvement and need for cognition have implications in terms of the processing of persuasive communication and shoppers' price and coupon sensitivities.

Attitudinal loyals, because their loyalty is the outcome of cognitive processing, are expected to be very knowledgeable about the product category. The breadth of their knowledge would extend to relative prices and pricing patterns in the product category. Attitudinal loyals would have higher levels of category mavenism. Because of this, attitudinal loyals are hypothesized to be in the main more price sensitive than behavioral loyals. Behavioral loyals on the other hand because their

loyalty is not the outcome of cognitive processing are expected to have lower category maven tendencies which is the outcome of cognitive processing. Behavioral loyals are expected to have lower category mavenism and lower category involvement than attitudinal loyals. Because behavioral loyals have relatively low category mavenism we hypothesized that they will be more susceptible to coupons. Coupons serve as promotion signals. Research by Inman, McAlister and Hoyer (1990) suggests that promotion signals are most effective with shoppers and in product categories where cognitive processing is low. In the next chapter we present a methodology to test our hypotheses.

CHAPTER 5

METHODOLOGY

In this chapter the data collection and analytic procedures employed in the study are discussed. We describe how the key construct of brand loyalty is operationalized. Next we outline our brand behavior models then detail how these models are used to test our hypotheses.

Data Collection

We examine how marketing actions affect brand behaviors by observing the brand behaviors of households that are members of a loyalty program for a retailer with stores in the northeastern United States. Working with a manufacturer of snack foods we are able to obtain scanner data showing the purchasing behavior for two years of a sample of households that are members of the retailer's loyalty program. The scanner data contains price and coupon use information. We also obtain demographic information on members of the loyalty program. Our study is limited to salty snacks that are sold in 5.5 - 20 oz. size packages. Salty snacks are defined as "ready-to-eat products that are fried, baked, or popped. Most people think of them as 'chips' but they could also include crisps, puffs, and twists (pretzels). They can be eaten out of the package, or with dips and salsa. They do not include crackers, popcorn, nuts, or goldfish (Appendix B, question 5)." We do not include multi-package items or single packages over 20 oz. The single package 5.5 - 20 oz. items

constitute 95% of the purchase volume in the salty snack product category in this supermarket chain.

As part of a major research project the snack food manufacturer, working in collaboration with the retailer and the University of Maryland, administered a comprehensive salty snacks survey to a sample of loyalty program members. The survey was mailed to 9,440 loyalty club members. A financial incentive, in the form of a $10 grocery gift certificate redeemable at the retailer, was part of the administration of the survey in order to encourage participation from survey recipients. Included in the survey were measures on brand attitudes, category involvement, and quality perceptions. A copy of the survey is shown in Appendix B. A total of 2,647 surveys were returned, a 28% return rate.

A comparison was made between households that responded to the survey and those that did not respond. Responding and non-responding households were compared in terms of length of residence and number of adults in the household. As shown in Table 2, there are statistically significant differences between respondents and non-respondents with respect to these two demographic variables. Responding households are slightly larger and have lived at their residence a little longer than non-responding households. This suggests that these households are more settled in the community, are more familiar with the supermarket, and have been members of the loyalty club for a longer period of time compared to households who did not respond to the survey. It is perhaps

needful to bear in mind, however, that length of residence or number of adults in household data is not available for a critical mass (more than 20%) of loyalty club members. Our examination of the data suggests that differences between respondents and non-respondents with respect to demographic variables are meager and not substantial though such differences may attain statistical significance.

Table 2
Comparison between Responding and Non-responding Households

Variable	Status	*N*	Mean	|*t*| statistic	*p* value
Length of residence	Non-respondents	5,402	7.15 yrs.	3.5963	0.0003
	Respondents	1,964	7.67 yrs.		
Adults in household	Non-respondents	5,329	2.62 adults	6.2338	<0.0001
	Respondents	1,945	2.84 adults		

The choice of salty snacks as a product category suitable for the purposes of our research may be justified on several grounds. Salty snacks are frequently purchased consumer products. Previous studies examining brand loyalty have also looked at frequently purchased consumer goods (e.g. Dillon and Gupta 1996 (jumbo paper towels); Grover and Srinivasan 1992 (coffee); Papatla and Krishnamurthi 1996 (laundry detergent)). The salty snack product category may be categorized as competitively active with numerous brands battling for market share and marketing actions, in the form of price changes and couponing activity, been very frequent. The diversity of brands and wide differences in consumer tastes makes for a product category with

substantial variation in brand loyalties. These facts make this product category very suitable for our purposes.

Operationalization of brand loyalty

Shoppers are segmented based on their attitudinal and behavioral loyalty. Shoppers' attitudinal loyalty with respect to the salty snack product category is measured following Bennett and Kassarjian's (1972) modified measure of attitudinal brand loyalty. Bennett and Kassarjian's (1972) measure of category attitudinal brand loyalty, *CAL*, is algebraically expressed as:

$$CAL = \left(\frac{U}{F}\right)(1.0 - N),$$

where

CAL = category attitudinal loyalty,
F = proportion of brands viewed favorably,
U = proportion of brands viewed unfavorably, and
N = proportion of brands toward which the subject has a neutral attitude.

This measure of attitudinal loyalty is based on the social judgment-involvement approach to attitude assessment put forward by Sherif, Sherif, and Nebergall (1965). In the survey subjects are asked to identify which of 28 brands in the salty snack food category they found "acceptable," "unacceptable," or for which they had "no opinion." Brands that are regarded as "acceptable," "unacceptable," or for which the respondent has "no opinion" are assigned to the acceptance, rejection, and non-commitment regions, respectively. Attitudinal loyalty is high

when only a relatively few brands are deemed acceptable. Attitudinal loyalty is low when relatively few brands are unacceptable.

When Bennett and Kassarjian's (1972) measure is applied to the subjects in our study we find that the value of *CAL* for more than 20% of the subjects was either a) zero or b) undefined because of division by zero (i.e., the denominator has a value of zero). This development we label the "zero problem." The *CAL* measure is designed to reflect the extent to which one's attitudinal loyalty is concentrated or diluted. A subject's attitudinal loyalty is more concentrated when any one of the following three circumstances occur:

1) the subject views proportionately fewer brands favorably,
2) the subject views proportionately more brands unfavorably, or
3) the subject views proportionately fewer brands neutrally.

Clearly, the possibility of no brand being viewed favorably makes *CAL* indeterminate for some shoppers. Furthermore, the prevalence in our case of a large number of instances where no brand was viewed unfavorably, rendering the value of *CAL* zero, irrespective of the proportion of neutral brands, suggests that the *CAL* measure may benefit from some form of modification that maintains its salient properties. The salient properties of the *CAL* measure and its general interpretation is maintained by exponentiation of each of its constituent elements. Our measure of category attitudinal loyalty, which is a modification of Bennett and Kassarjian's (1972) measure, is expressed as:

$$CAL^{*} = \left(\frac{e^{U}}{e^{F}}\right)\left(e^{1} - e^{N}\right),$$

where

CAL^{*} = CAL adjusted for "zero problem,"[11]
e = a constant ≈ 2.718
F = proportion of brands viewed favorably,
U = proportion of brands viewed unfavorably, and
N = proportion of brands toward which the subject has a neutral attitude.

This modification of CAL, CAL^{*}, eliminates the division by zero problem. In those instances where the subject is completely ambivalent about the brands (i.e., all brands are viewed neutrally, 2% of the cases) then the value of CAL^{*} is zero. We used CAL^{*} as our measure of category attitudinal loyalty.

We operationalize category behavioral brand loyalty by taking the inverse of an entropy measure of brand loyalty shown in Carman (1970)[12]. Our measure of behavioral brand loyalty, CBL, is given as,

$$CBL = -1 \Big/ \sum_{i=1}^{k} p_i \ln p_i$$

where,

CBL = category behavioral brand loyalty,
p_i = proportion of purchases going to brand i,
k = the number of different brands purchased by household,
$CBL > 0$ and $\underset{p_i \to 1}{Lim}\, CBL = \infty$.

With this measure of behavioral brand loyalty, when purchases are concentrated in relatively few brands CBL assumes high values. When purchases are diluted across many brands CBL assumes low values. The

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[11] Because of the skewness of CAL^{*}, a logarithmic transformation is applied to the measure throughout the study. The skewness of CAL^{*} is not a function of the exponentionation process. Indeed, CAL, is much more heavily skewed.

CBL measure is similar in principle to the *CAL** measure in that both measures show the extent to which one's loyalties are concentrated or diluted. This measure of behavioral brand loyalty also accounts for shoppers' divided loyalties (Yim and Kannan 1999) across a set of acceptable brands. The interaction of *CAL** and *CBL*, *CAL** × *CBL*, produces a two-dimensional composite measure of brand loyalty, *CCL*.

Modeling of Choice Behaviors and Hypotheses Testing

We model the brand choice behavior of households who choose at least three packages of salty snacks in the first and second year of scanner data and responded to at least 2/3 of the attitudinal questions on the salty snacks survey. There were 1,290 households that meet this criterion.[13] These households bought 34,013 packages. The criteria of at least three brand choices for selection in the sample ensures that the model is not applied to households who purchase salty snacks very infrequently at the retail chain from which we have obtained the data. The criteria that the respondent responded to at least 2/3 of the attitudinal questions gives us reasonable assurance that the subjects in our study undertook the survey task with a fair degree of earnestness. There were very few omissions to the attitudinal questions and for the

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[12] We take the inverse of Carman's (1970) entropy measure so that the higher values on the entropy scale will correspond to higher levels of loyalty.

[13] Of the 2,647 households for which we had survey and scanner data, 24 were eliminated because they missed more than 2/3 of the attitudinal items. This reduces the potential sample size to 2,623. Of these households 1,333 had to be eliminated because they did not purchase at least three packages from the supermarket chain in both years of for which we have scanner data. There are 1,691 households who

omissions we assumed that the respondent had a neutral opinion toward the specific brand item (0.64% of the cases).

There are 30 different package sizes in the range of 5.5 - 20 oz. Preliminary examination of the data reveals that there are three sizes that are extremely popular, the 6, 10, and 14 oz. sizes. This suggests that the market is sub-divided into three sizes: small, large, and medium. Packages less than 9 oz., packages that were least at 9 oz. but less than 14 oz., and packages 14 - 20 oz. were regarded as small-, medium- and large-size packages, respectively.

In our data there are fifteen different manufacturers competing in the salty snack product category. We consolidate the offerings into five sub-categories: 1) Frito-Lay brands, 2) Snyder brand, 3) Wegman's brand, 4) Wise brand, and 5) Other brands. The three sizes and five brands make for fifteen different manufacturer-sizes. Given the small number of Snyder-small items, these items were consolidated with the Snyder-medium manufacturer-size items. Similarly, given the small number of Wise-large items, these items were consolidated with the Wise-medium items. This resulted in thirteen manufacturer-sizes. Market structure and market share is given in Table 3.[14]

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purchased at least one package of salty snacks in both years of scanner data and completed at least 2/3 of the attitudinal items.

[14] This is based on the purchase behavior of the 1,290 households being studied here.

Table 3
Market Structure and Market Share (in units) for salty snacks

Manufacturer	Small	Medium	Large	Total
Frito-Lay	9.77%	9.17%	23.55%	42.49%
Snyder		3.11%	2.87%	5.98%
Wegman	1.30%	6.83%	11.48%	19.61%
Wise	7.44%	11.69%		19.13%
Other	9.40%	1.66%	1.72%	12.79%
Total	27.92%	32.46%	39.62%	100.00%

Market share, as matter-of-factly noted by Guadagni and Little (1983), is simply the aggregation of individual customer choices. In applying the choice model, Guadagni and Little (1983) point out that it is beneficial to ascertain where the level of aggregation occurs. The popularity of three package sizes, from a larger constellation of package sizes, suggests a natural grouping of three package sizes. Shoppers frequently demonstrate a preference for a particular size (e.g., the 14 oz. size); it is important that this tendency be incorporated in the choice model (Guadagni and Little 1983). Given that shoppers may have unique preferences toward different manufacturers and unique preferences toward different sizes it is useful that we view alternatives in terms of manufacturer-sizes.

Choice Model

The multinomial logit model has been extensively used in the literature (e.g., Guadagni and Little 1983) to model consumer choice behavior. We use the multinomial logit model to model choice in the salty snack product category. The logit model is given by

$$\text{Prob}(i^{H,t}) = \frac{\exp(U_i^{H,t})}{\sum_{i=1}^{I} \exp(U_i^{H,t})},$$

where $\text{Prob}(i^{H,t})$ is the probability that manufacturer-size i is chosen by household H on occasion t and where $U_i^{H,t}$ is the deterministic component of the utility of manufacturer-size i to household H on purchase occasion t which is expressed in the function:

$$U_i^{H,t} = \beta_{0i} + \beta_1 SIZLOYAL_i^H + \beta_2 ATTLOYAL_i^H + \beta_3 BEHLOYAL_i^H + \beta_4 COMLOYAL_i^H + \beta_5 PRICE_i^t + \beta_6 PRICEATT_i^{H,t} + \beta_7 PRICEBEH_i^{H,t} + \beta_8 PRICECOM_i^{H,t} + \varepsilon_i^t$$

where:

$SIZLOYAL_i^H$ = H's size loyalty for size i,

$ATTLOYAL_i^H$ = H's attitudinal loyalty for i,

$BEHLOYAL_i^H$ = H's behavioral loyalty for i,

$COMLOYAL_i^H = ATTLOYAL_i^H \times BEHLOYAL_i^H$,

$PRICE_i^t$ = ln(net price/oz.) for i at t,

$PRICEATT_i^{H,t} = PRICE_i^t \times ATTLOYAL_i^H$,

$PRICEBEH_i^{H,t} = PRICE_i^t \times BEHLOYAL_i^H$,

$PRICECOM_i^{H,t} = PRICE_i^t \times COMLOYAL_i^H$,

β_{0i} = manufacturer-size specific constant for i,

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$, and β_8 = coefficients to be estimated, and

ε_i^t = random error in the utility of i at t.

The multinomial logit model is a random utility model where the utility to a consumer of an alternative ($U_i^{H,t}$) is specified as a linear function of the characteristics of the consumer and the attributes of the alternative, plus an error term. With the multinomial logit model the

error terms are assumed to be independently and identically distributed as a log Weibull distribution (Kennedy 1998). The multinomial model, like other random utility models, assumes that the consumers will choose the alternative that maximizes their utility (Amemiya 1985).

We include variables for attitudinal and behavioral loyalty toward specific manufacturers to capture shoppers' preference for certain manufacturers. Size loyalty and brand loyalty are proportion of purchase measures calibrated on the first year of scanner data. Using a proportion of purchase measure to measure loyalty is in keeping with Tellis (1988) and Krishnamurthi and Raj (1991). Behavioral loyalty to specific manufacturer-sizes, $BEHLOYAL_i^H$, is heavily skewed so a logarithmic transformation is applied to $BEHLOYAL_i^H$ to produce a better fitting model. The natural logarithm (ln) of net price (as opposed to actual price) is used because it produces a better model fit and consumers' subjective price scales have been found to be logarithmic in character (Gabor and Granger 1966; Monroe 1990). Net price is total price (inclusive of any coupon discounts) divided by package size. Net price provides us with comparable prices across all choice options and is the standard manner in which price is operationalized in brand choice models (e.g., Papatla and Krishamurthi 1996). The mean net price paid was 14.96 cents/oz., with a standard deviation of 7.39 cents/oz.; the median net price was 14.19 cents/oz.

Attitudinal loyalty toward the five manufacturers is determined by allocating each household's CAL^* score across the five manufacturers. The allocation of the CAL^* score to each manufacturer is accomplished in accordance with the following formula:

$$ATTLOYAL_i^H = CAL^* \times \frac{Fav_i^H}{TFav^H}$$

where:

$ATTLOYAL_i^H$ = H's attitudinal loyalty toward i,

CAL^* = Category attitudinal loyalty,

Fav_i^H = Total number of favorably rated items belonging to i judged by H, and

$TFav^H$ = Total number of favorably rated items judged by H.[15]

To determine the shopper's attitudinal loyalty towards specific manufacturers we take the shopper's category attitudinal loyalty, CAL^*, and allocate it across each manufacturer based on the proportion of items belonging to the manufacturer that constitutes the shopper's consideration set. $TFav^H$ is the total number of items in the shopper's consideration set as this is the number of items that the shopper views favorably. Fav_i^H is the number of items in the consideration set belonging to manufacturer i. $Fav_i^H / TFav^H$ therefore represents the proportion of items belonging to manufacturer i in the consideration set. The higher a manufacturer's proportion of items in the shopper's consideration set then the higher the attitudinal loyalty of the shopper

toward that particular manufacturer. Our $ATTLOYAL_i^H$ measure ensures that a manufacturer with no item in the shopper's consideration set obtains a score of zero for attitudinal loyalty toward that manufacturer.

The variables in the choice model can be *alternative specific* or *common* across the alternatives. In the case where the variables are *alternative specific* a unique coefficient is estimated for each alternative. In the case where the variable is *common* across the alternatives a single coefficient is estimated for all alternatives. An alternative specific dummy variable is included in the model to account for the unique component of a manufacturer-size not captured by other explanatory variables. The number of alternative specific dummy variables must be one less than the number of alternatives in order to avoid singularity in the maximum likelihood estimation. The "Other-medium" manufacturer-size serves as our base manufacturer-size and its coefficient is omitted.

Similar to Guadagni and Little's (1983) brand choice model, the other variables in the model are taken to be common across the thirteen manufacturer-size alternatives. This allows us to generate a relatively parsimonious model in light of the large number of manufacturer-sizes. As noted earlier, we apply the choice model to manufacturer-sizes to reflect a natural level of aggregation that appears to be consistent with the observed buying patterns in the product category.

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[15] In those instances where the subject did not rate any item favorable *CAL'* was allocated equally across the five brands. Of the 1,290 households 90 households (7%) did not rate any brand favorably.

We do not include shoppers' category attitudinal and behavioral loyalty (i.e., *CAL** and *CBL*) as variables in the choice model. Shopper's category loyalty is common across all alternatives and therefore individual coefficients would have to be estimated for each manufacturer-size. In addition, individual coefficients would have to be estimated for their interactions with price. This would add 72 more coefficients to the model and result in a model with 92 estimated coefficients. Therefore, in order to observe differences in price sensitivity across the loyalty segments with the use of parsimonious models we develop choice models for each segment. We also develop an omnibus model for all segments.

All multiplicative variables along with their constituent elements are mean-centered to reduce multicollinearity. Attitudinal and behavioral loyalty toward specific manufacturer-sizes were standardized with a mean of zero and a standard deviation of one so that their coefficients may be directly comparable. Households were assigned to the four loyalty segments using the following classification criteria:

Non-loyals: Households whose category attitudinal loyalty (*CAL**) and category behavioral loyalty (*CBL*) values are ≤ the sample's *CAL** and *CBL* means;

Latent loyals: Households whose *CAL** value > the sample's mean *CAL** value and whose *CBL* value ≤ the sample's mean *CBL* value;

Spurious loyals: Households whose *CAL** value ≤ the sample's mean *CAL** value and whose *CBL* value > the sample's mean *CBL* value; and

True loyals: Households whose *CAL'* and *CBL* values are > the sample's *CAL'* and *CBL* means.[16]

Demographic characteristics on the segments and the sample are given in Table 4. By and the large the respondents were middle-age college educated married females who worked full-time outside of the home. On the average the households in each segment both between two and three dozen packages of salty snack product.

Table 4A
Demographics of Non-loyals (n = 518 households)

Variable	Value	HHs providing data
Average age of respondent	45.11 yrs.	504
Average number of persons in household	3.17	508
Female respondents	83.6%	512
Employed full time outside the home	47.2%	513
Married respondents	75.3%	511
Respondents with at least a college degree	28.7%	509
Average number of packages bought	23.42	518

Table 4B
Demographics of Spurious loyals (n = 376 households)

Variable	Value	HHs providing data
Average age of respondent	46.42 yrs.	364
Average number of persons in household	2.89	367
Female respondents	81.4%	370
Employed outside the home	50.1%	367
Married respondents	74.3%	369
Respondents with at least a college degree	23.2%	366
Average number of packages bought	24.32	376

[16] Neither the *CAL'* nor *CBL* measures are skewed with skew values of 0.157 and 0.638, respectively. Hence their mean values are satisfactory for demarcation purposes.

Table 4C
Demographics of Latent loyals (n = 212 households)

Variable	Value	HHs providing data
Average age of respondent	45.73 yrs.	202
Average number of persons in household	3.00	207
Female respondents	83.7%	208
Employed outside the home	55.1%	207
Married respondents	71.0%	207
Respondents with at least a college degree	27.2%	206
Average number of packages bought	34.98	212

Table 4D
Demographics of True loyals (n = 184 households)

Variable	Value	HHs providing data
Average age of respondent	46.40 yrs.	179
Average number of persons in household	2.88	183
Female respondents	88.4%	181
Respondent employed outside the home	51.9%	183
Married respondents	73.1%	182
Respondents with at least a college degree	30.4%	181
Average number of packages bought	28.91	184

Table 4E
Demographics of total sample (n=1,290 households)

Variable	Value	HHs providing data
Average age of respondent	45.78 yrs.	1,249
Average number of persons in household	3.02	1,265
Female respondents	83.6%	1,271
Respondent employed outside the home	50.0%	1,270
Married respondents	74.0%	1,269
Respondents with at least a college degree	27.1%	1,262
Average number of packages bought	26.37	1,290

Testing Choice Behavior Hypotheses

It is hypothesized in H1 that in the choice decision that shoppers will be less price sensitive to items to which they are attitudinally loyal. We hypothesized in H2 that shoppers would be less price sensitive to brands to which they are behaviorally loyal. Furthermore we

hypothesized in H3 that shoppers would be least price sensitive to brands to which they are truly loyal, ceteris paribus. We test these hypotheses by observing the sign and statistical significance of the $PRICEATT_i^{H,t}$, $PRICEBEH_i^{H,t}$, and $PRICECOM_i^{H,t}$ coefficients in our choice model. Coefficients that are positive in direction and statistically significant indicate support for our hypotheses.

We also hypothesized that latent loyals will be more price sensitive in their brand choice decisions than spurious loyals (H4). We test this hypothesis by observing the magnitude of the price coefficient in the choice models for latent and spurious, and true loyals. Our hypotheses are supported if the price coefficient for latent loyals is larger than that of spurious loyals. We will also examine the price coefficients of the non-loyals and true loyals to get a complete sense of the differences in price sensitivity between the segments.

Modeling of Purchase Quantity Behavior and Hypotheses Testing

We model the purchase quantity behavior of households who made salty snack purchases on at least three dates in the first and second year of scanner data and responded to at least two-thirds of the attitudinal questions on the salty snacks survey. We treat all purchases occurring on the same date as a single observation. There were 1,181 households meeting these criteria. [17] These households made a total of 17,453

[17] In the choice model the sample consisted of those households who purchased at least three packages in year 1 and three packages in year 2. For the purchase quantity model the sample consists of households that purchased on at least three dates in year 1 and

purchases.[18] Descriptive statistics about the sample and their purchases is given in Table 4.

Purchase Quantity Model

We model purchase quantity in the salty snack product category with a regression model. The regression model is:

$$\begin{aligned} Qty_t^h = {} & \beta_0 + \beta_1 NETPRICE_t^h + \beta_2 CPNUSED_t^h + \beta_3 CAL^h \\ & + \beta_4 CBL^h + \beta_5 CCL^h + \beta_6 PRALOYAL_t^h \\ & + \beta_7 PRBLOYAL_t^h + \beta_8 PRCLOYAL_t^h + \beta_9 CPALOYAL_t^h \\ & + \beta_{10} CPBLOYAL_t^h + \beta_{11} CPCLOYAL_t^h + \beta_{12} LNMEANPQ^h \\ & + \beta_{13} LNINV_t^h + \beta_{14} LNIPT_t^h + \beta_{15} NUMH^h \\ & + \beta_{16} HHATTINT^h + \beta_{17} HHBEHINT^h + \beta_{18} HHCOMINT^h \\ & + \beta_{19} HHPRICE_t^h + \beta_{20} HHCPN_t^h + \beta_{21} LNADCR^h \\ & + \beta_{22} URATTINT^h + \beta_{23} URBEHATT^h + \beta_{24} URCOMINT^h \\ & + \beta_{25} USEPRICE_t^h + \beta_{26} USECPN_t^h + \beta_{27} LN\_N\_S_t^h \\ & + \beta_{28} WGTCPN_t^h + \varepsilon_t^h \end{aligned}$$

where:

Qty_t^h = ln(purchase quantity (in ounces) of salty snacks made by h at t),

$NETPRICE_t^h$ = Net price/oz. paid by h at t,

$CPNUSED_t^h$ = Dummy variable (0/1) for coupon use by h at t,

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three dates in year 2. Households are not limited to purchasing a single package on a single date hence the difference between the number of households in the choice and purchase quantity samples.

[18] Our sample contains multiple observations from each household. This approach to modeling purchase behavior is the established practice. For example, in Gupta's (1988) study the validation sample contained 859 observations from 100 households, that is, there was on the average 8.59 observations from each household in the sample. The multiple observations from a household are not independent of each other; this is a violation of the assumptions of the model. Incorporating household characteristics as covariates accounts in part for household effects and the observations attributed to each household but do not account for the interdependence for observations from the same household. As we later report a diagnostic check of the residuals suggest that the residuals are reasonably well behaved. However, methods that account for the interdependence among some observations may or may not, given the outcome of such methods, alter the confidence we hold in the results of our analysis.

CAL^{*h} = Category attitudinal loyalty of h,
CBL^h = Category behavioral loyalty of h,
$CCL^h = CAL^{*h} \times CBL^h$,
$PRALOYAL_t^h = NETPRICE_t^h \times CAL^{*h}$,
$PRBLOYAL_t^h = NETPRICE_t^h \times CBL^h$,
$PRCLOYAL_t^h = NETPRICE_t^h \times CCL^h$,
$CPALOYAL_t^h = CPNUSED_t^h \times CAL^{*h}$,
$CPBLOYAL_t^h = CPNUSED_t^h \times CBL^h$,
$CPCLOYAL_t^h = CPNUSED_t^h \times CCL^h$,
$LNMEANPQ^h$ = ln(mean purchase quantity for h),
$LNINV_t^h$ = ln(estimated household inventory for h at t),
$LNIPT_t^h$ = ln(inter-purchase time for h at t),
$NUMHH^h$ = number of persons in h,
$NUMATTINT^h = NUMHH^h \times CAL^{*h}$,
$NUMBEHINT^h = NUMHH^h \times CBL^h$,
$NUMCOMINT^h = NUMHH^h \times CCL^h$,
$HHPRICE_t^h = NUMHH^h \times NETPRICE_t^h$,
$HHCPN_t^h = NUMHH^h \times CPNUSED_t^h$
$LNADCR^h$ = ln(average daily consumption rate) of h,
$URATTINT^h = LNADCR^h \times CAL^{*h}$,
$URBEHATT^h = LNADCR^h \times CBL^h$,
$URCOMINT^h = LNADCR^h \times CCL^h$,
$USEPRICE_t^h = LNADCR^h \times NETPRICE_t^h$,
$USECPN_t^h = LNADCR^h \times CPNUSED_t^h$,
$LN\_N\_S_t^h$ = ln(total net sale of shopping visit by h at t),
$WGTCPN_t^h$ = proportion of salty snack purchase made by h at t that is couponed,
ε_t^h = error term, and
β_i = coefficients to be estimated.

Table 5

Descriptive Statistics on sample used to model Purchase Quantity Behavior (17453 observations)

Variable	Mean	Standard Deviation	Minimum	Median	Maximum
Purchase Quantity	20.84 oz.	14.06	5.50	16.00	264.00
Net price	14.99 cents/oz.	5.60	0.00[19]	13.27	42.11
Coupon use[20]	0.73	0.44	0.00	1.00	1.00
Category attitudinal loyalty	0.66	0.21	0.00	0.61	1.74
Category behavioral loyalty	-0.92	0.32	-1.56	-0.97	0
Mean purchase quantity	20.75 oz.	7.33	5.90	20.25	55.10
Estimated Inventory	36.88 oz.	20.44	5.5	33.32	264.00
Inter-purchase time	24.39 days	35.00	1.00	13.00	414.00
Household size	3.26 persons	1.38	1	3	10
ADCR[21]	1.46 oz./day	1.12	0.07	1.15	7.39
Total net sale[22]	$65.93	48.81	-0.30[23]	56.05	638.73
Proportion of purchase that is couponed	0.62	0.42	0.00	0.85	1.00

[19] There were two instances where the coupon discount was greater than or equal to the shelf price.
[20] Coupon use is a dummy variable; 1 = coupon used in purchase, 0 = otherwise.
[21] ADCR = Average daily consumption rate.
[22] This refers to the net value of the market basket when salty snacks were purchased.
[23] This is the lone occasion where the total value of coupon discounts exceeded the total shelf price of items purchased on this shopping occasion. The next lowest value was $0.99, which occurred three times.

There are five basic assumptions of the regression model. The assumptions are:

1. The dependent variable is a linear function of a specific set of independent variables, plus an error term.
2. The expected value of the error term is zero.
3. The error terms have uniform variance and are uncorrelated.
4. The observations on independent variables can be considered fixed in repeated samples.
5. There are no exact linear relationships between independent variables and there are more observations than independent variables (Kennedy 1998, p. 48).

Our dependent variable is the natural log of the purchase quantity of salty snacks made by the household on each purchase occasion. Krishnamurthi and Raj (1988) and Krishnamurthi, Mazumdar, and Raj (1992) used the logarithmic form of the dependent variable in their purchase quantity models. The logarithmic transformation of the dependent variable produces a much better fitting model (an improvement of 0.15 in the model's R^2) than one where the dependent variable is not transformed.

Household inventory is likely to be a significant predictor of purchase quantity. We estimate inventory based on the following identity:

$$Inv_t^h = Inv_{t-1}^h + Qty_{t-1}^h - Cons_{t-1}^h$$

where,

Inv_t^h = inventory carried by household h at purchase occasion t,
Inv_{t-1}^h = inventory carried by h at purchase occasion t-1,
Qty_{t-1}^h = Quantity purchased by h at t-1, and
$Cons_{t-1}^h$ = Consumption by h beginning at t-1 and ending at t.

It is also necessary to estimate consumption. As the inter-purchase time lengthens consumption increases until all available inventory is consumed. Like Ailawadi and Neslin (1998) we adopt the reasonable assumption that household consumption varies continuously and nonlinearly with actual inventory. The more you have the more you consume. In light of these assumptions we model consumption in a manner similar to Ailawadi and Neslin's (1998) as a nonlinear function of available inventory, inter-purchase time, and the household's usage rate:

$$Cons_t^h = Inv_t^h \left[\frac{\ln(\bar{C}^h \times IPT)}{\ln(\bar{C}^h \times IPT) + (Inv_t^h)^f} \right]$$

where,

$Cons_t^h$ =Consumption by household h that begins at purchase occasion t and ends at purchase occasion $t+1$,
Inv_t^h = Inventory of household h at purchase occasion t,
$\bar{C}^h$ = Average daily consumption rate (from calibration period),
IPT = Inter-purchase time, and
f = a consumption flexibility parameter.

This specification of consumption, whose shape is depicted in Figures 2, 3, and 4, is consistent with the suggestion of the psychophysical literature (see Engel, Blackwell, and Miniard 1995, pp. 475-76) that consumption increases in the presence of more inventory at a decreasing rate. Figure 2 shows that households with higher usage rates consume more of their inventory than households with lower usage rates, ceteris paribus. Figure 3 shows that households consume more of their inventory the greater the consumption flexibility of the product,

ceteris paribus.[24] Figure 4 shows that household consumer more of their inventory the longer the inter-purchase time, ceteris paribus. If the inter-purchase time exceeds 42 days (more than three times the median inter-purchase period of 13 days) then the household is assumed to have consumed its entire inventory.[25]

This measure of consumption, as pointed out by Ailawadi and Neslin (1998), possesses several attractive characteristics including:

1. Daily consumption rate in a given spell varies according to the length of that consumption spell. The daily consumption rate in a short spell is higher than the daily consumption rate for a long spell.
2. It is parsimonious with only the consumption flexibility parameter, *f*, to be estimated. The flexibility parameter determines how responsive consumption is to high levels of inventory.[26] In Ailawadi and Neslin's (1998) study they estimate $f = 0.9$ and -0.65 for ketchup and yogurt respectively. In the case of salty snacks we estimate $f = 0.25$, which appears to be quite reasonable. (The *f* parameter is estimated by examining the fit of models with different values of *f*. A value of $f = 0.25$ produces the best fit. This is the same method used by Ailawadi and Neslin (1998)). Salty snacks have more consumption flexibility than ketchup hence its *f* should be lower. Yogurt is very perishable and must be refrigerated. Its presence is made

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[24] Consumption flexibility is reflected by the flexibility parameter, *f*. Lower values of *f* suggest greater consumption flexibility.

[25] During the course of this investigation the researcher visited three stores (two supermarkets and one mass merchandiser) to observe the "guaranteed fresh date" on salty snacks. In most instances the "guaranteed fresh date" was on the order of three or four weeks with a maximum of five weeks. Hence, it seems reasonable to assume that most households would have dispensed of their inventory of salty snacks after having it for six weeks.

[26] Ailawadi and Neslin (1998, p. 392) note that their consumption rate function, not unlike most nonlinear functions, is "not invariant with respect to the units of measurement." Hence the need to evaluate the shape of the function at various values of *f* over the range of data that is being used. Extremely low values for *f* indicate that households consume their entire inventory (save an infinitesimal amount) between purchase occasions. Very high values for *f* suggest that households consume microscopic amounts inventory between purchases. Products that are prone to be bought impulsively and products that consumers find easy to stockpile should have small *f*s (Narasimhan, Neslin, and Sen 1996).

very salient every time the refrigerator door is opened which encourages yogurt consumption when inventory is high. Salty snacks can be kept out of sight, and for many consumers out of sight is indeed out of mind (Wansink and Deshpandé 1994). Therefore it appears quite reasonable that the f parameter for salty snacks is higher than that of yogurt.

3. Heavy-user households (i.e., households with high $\overline{C}^h$ values) consume more than light-user households at any given inventory level and for any value of f.
4. Because consumption is modeled as a continuous, nonlinear function of available inventory, consumption never exceeds inventory as is probable with other specifications of consumption (Ailawadi and Neslin 1998, p. 392). Furthermore, we allow for the household to consume its entire inventory at the end of a long consumption spell.

The covariates representing mean purchase quantity, inter-purchase time, size of household, usage rate, size of the shopping trip, and proportion of purchase that is couponed are included in the model so that the model may be properly specified. These covariates are frequently included in other purchase behavior models (e.g., Ailawadi and Neslin 1998; Gupta 1988; Sivakumar 1995). A table showing the covariates used in this model and other models is shown in Table 7.

The attitudinal and behavioral loyalty variables are standardized with a mean of zero and a standard deviation of one so that the coefficients of these variables may be directly comparable. All multiplicative variables and their constituent elements are mean-centered to minimize the ill-effects of multicollinearity.

Figure 2
Effect of Average Daily Consumption Rate (ADCR) on Consumption
(f=0.25; Spell=13 days)

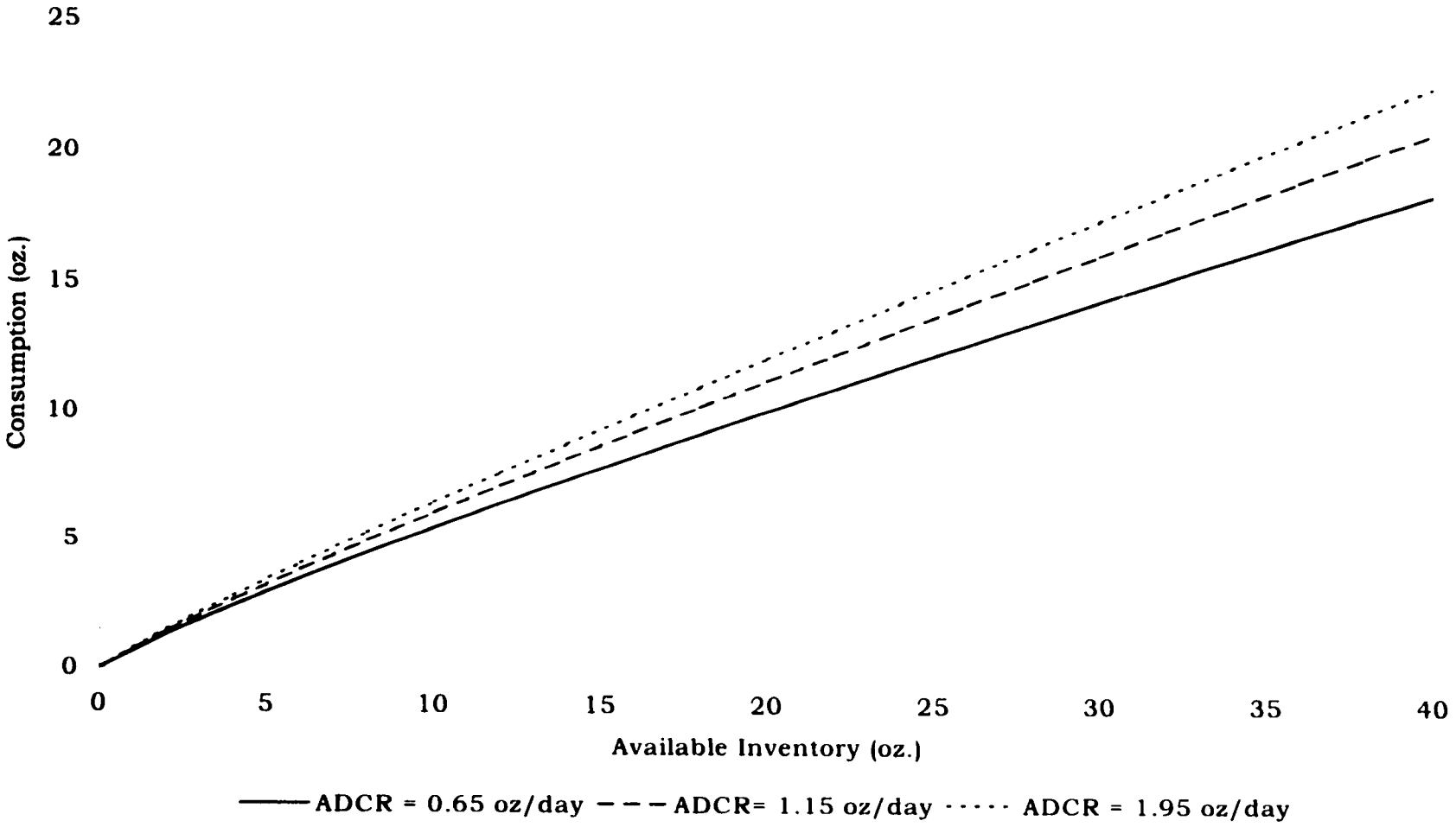


Figure 3
Effect of flexibility parameter on Consumption
(ADCR =1.15 oz./day and Spell = 13 days)

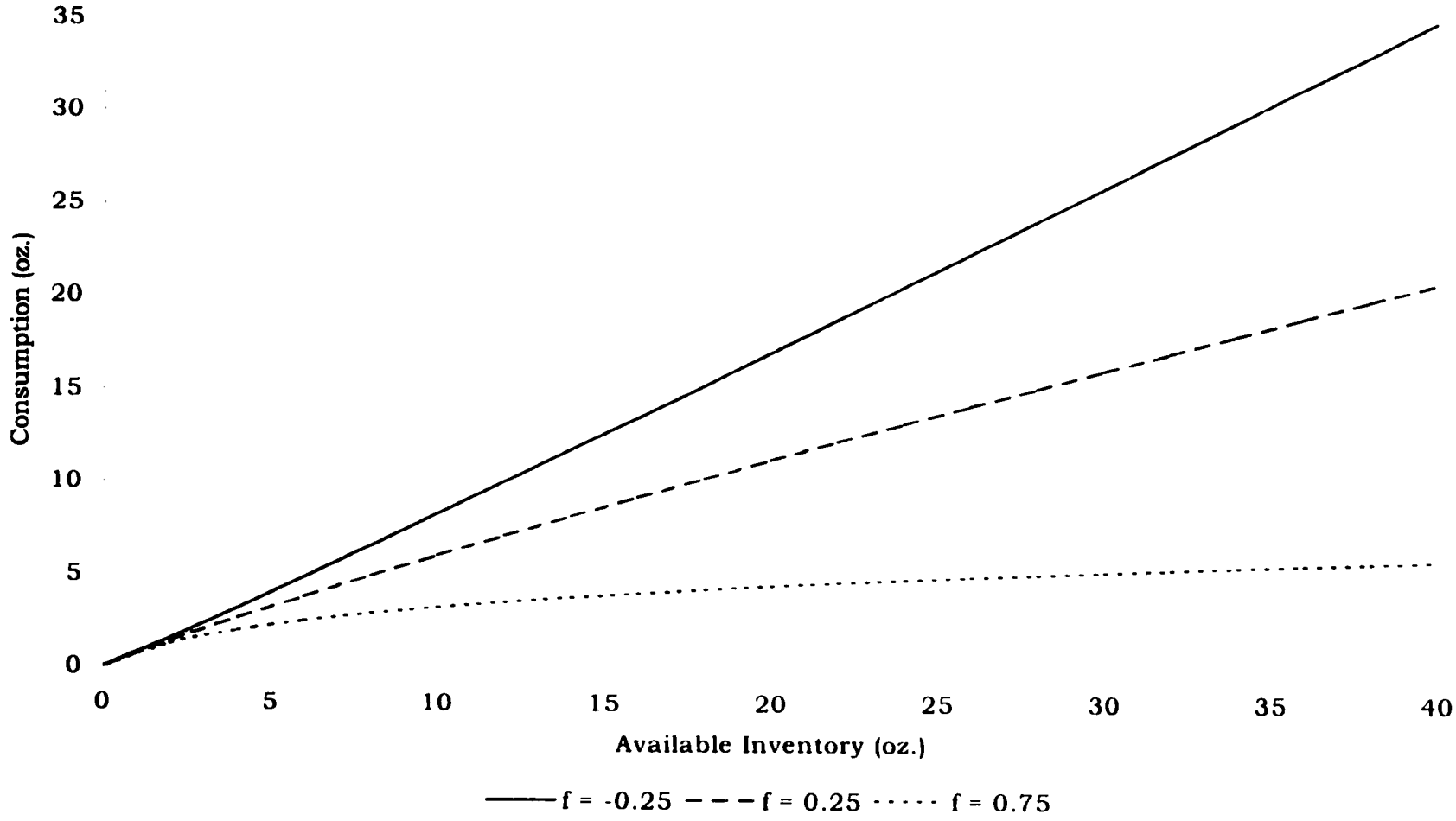
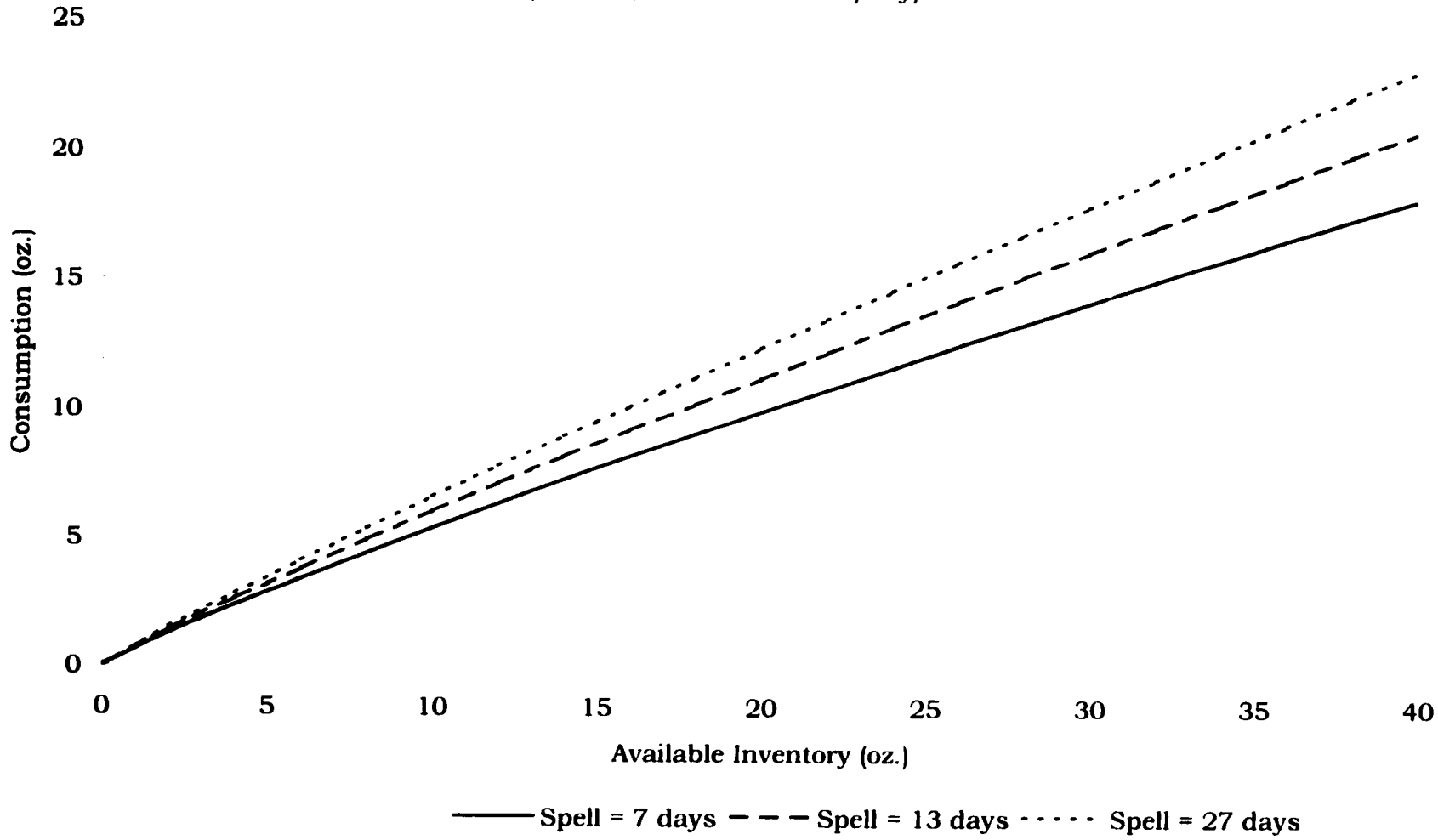


Figure 4
Effect of length of consumption spell on Consumption
(f = 0.25; ADCR = 1.15 oz./day)



Testing Purchase Quantity Hypotheses

We have hypothesized that in the main attitudinal loyals are more price sensitive than behavioral loyals (H5). This is a hypothesis about the "main effects" of the two dimensions of loyalty. We test this hypothesis by performing a joint *F*-test to determine if the $PRBLOYAL_t^h$ coefficient is significantly larger than the $PRALOYAL_t^h$ coefficient.

It is hypothesized that behavioral loyals are more coupon sensitive than attitudinal loyals (H6). Our test of this hypothesis is similar to that for H5. We perform a joint *F*-test to determine if the $CPBLOYAL_t^h$ coefficient is significantly larger than the $CPALOYAL_t^h$ coefficient. A finding of statistical significance provides support for H6.

Modeling of Purchase Timing Behavior and Hypotheses Testing

In this section we detail the purchase timing model then show how our purchase timing hypotheses are to be tested.

Purchase Timing Model

Purchase timing is modeled with Cox's proportional hazard model. Proportional hazard models assume that the hazard for any subject is a fixed proportion of the hazard of any other subject. The ratio of the hazards is not time dependent (Allison 1995; Collett 1994). Helsen and Schmittlein (1993) find proportional hazard regression methods to be superior to other methods of modeling duration times (e.g., logit) with respect to stability and face validity of the estimates and in terms of

predictive accuracy. The hazard rate, $h_i(t)$, is the conditional likelihood that the event of interest (i.e., purchase) occurs at duration time t, given that it has not occurred in the duration interval (0, t), and is assumed to take the form

$$h_i(t) = h_0(t)e^{\beta' \mathbf{x}_{it}}$$

where:

$h_0(t)$= the baseline hazard function that captures the effect of time, and

$e^{\beta' \mathbf{x}_{it}}$ = a function that captures the effect of hypothesized variables and covariates on $h_i(t)$.

The hazard rate, $h_i(t)$, is by definition non-negative and its non-negativity can by assured by defining the baseline hazard function, $h_0(t)$, as an exponentiated function of time (Vilcassim and Jain 1991). The great attraction of the Cox model is that one is not forced to choose a particular probability distribution to represent survival times, making it an exceedingly robust method for performing survival analysis. With the Cox model $h_0(t)$ is left unspecified (Allison 1995). Trussell and Richards (1985) show that the measured effects of the covariates of hazard models are sensitive to the specification of the baseline hazard function. Having a general specification for $h_0(t)$ minimizes the likelihood of having a misspecified model and results in more robust estimates of the effects of the covariates (Vilcassim and Jain 1991).

In our purchase timing model, the function that captures the effect of hypothesized variables and covariates on $h_i(t)$ is $e^{\beta' \mathbf{x}_{it}}$ where

$$\beta' x_{it} = \beta_1 LNAVGIPT_i + \beta_2 PRICECHG_{i,t} + \beta_3 CPNUSED_{i,t} + \beta_4 CAL^*_i + \beta_5 CBL_i + \beta_6 CCL_i + \beta_7 PCALOYAL_{i,t} + \beta_8 PCBLOYAL_{i,t} + \beta_9 PCCLOYAL_{i,t} + \beta_{10} CPALOYAL_{i,t} + \beta_{11} CPBLOYAL_{i,t} + \beta_{12} CPCLOYAL_{i,t} + \beta_{13} LNPQ_{i,t-1} + \beta_{14} LNINV_{i,t} + \beta_{15} NUMHH_i + \beta_{16} HHATTINT_i + \beta_{17} HHBEHINT_i + \beta_{18} HHCOMINT_i + \beta_{19} LNADCR_i + \beta_{20} URATTINT_i + \beta_{21} URBEHINT_i + \beta_{22} URCOMINT_i ,$$

and

$LNAVGIPT_i$ = Natural log of average inter-purchase time for household i,

$PRICECHG_{i,t}$ = Net price at t - net price at t-1,

$CPNUSED_{i,t}$ = Coupon used by i at t,

CAL^*_i = Category attitudinal loyalty of i,

CBL_i = Category behavioral loyalty of i,

$CCL_i = CAL^*_i \times CBL_i$,

$PCALOYAL_{i,t} = PRICECHG_{i,t} \times CAL^*_i$,

$PCBLOYAL_{i,t} = PRICECHG_{i,t} \times CBL_i$,

$PCCLOYAL_{i,t} = PRICECHG_{i,t} \times CCL_i$,

$CPALOYAL_{i,t} = CPNUSED_{i,t} \times CAL^*_i$,

$CPBLOYAL_{i,t} = CPNUSED_{i,t} \times CBL_i$,

$CPCLOYAL_{i,t} = CPNUSED_{i,t} \times CCL_i$,

$LNPQ_{i,t-1}$ = ln(purchase quantity of i at t-1),

$LNINV_{i,t}$ = ln(estimate of i's inventory at t),

$NUMHH_i$ = number of persons in household i,

$HHATTINT_i = NUMHH_i \times CAL^*_i$,

$HHBEHINT_i = NUMHH_i \times CBL_i$,

$HHCOMINT_i = NUMHH_i \times CCL_i$,

$LNADCR_i$ = ln(average daily consumption rate),

$URATTINT_i = LNADCR_i \times CAL^*_i$,

$URBEHINT_i = LNADCR_i \times CBL_i$,

$URCOMINT_i = LNADCR_i \times CCL_i$, and

β_i = coefficients to be estimated.

Our purchase timing model is applied to the same sample used for the purchase quantity model. We use price change as our price variable in our purchase-timing model as was done in Jain and Vilcassim's (1991) purchase timing study. Because price at t-1 for the first observation for each household in year two of the data would the last price for that household in year one we have 16,272 observations. We used a duration period of 42 days; 1,854 of the observations were censored (i.e., 1,854 purchases were made after 42 days from the last prior purchase).

The covariates in the purchase timing model are similar to those in purchase timing models by Gupta (1988), Helsen and and Schmittlein (1994), Jain and Vilcassim (1991), and Vilcassim and Jain (1991). As with the other models, the attitudinal and behavioral loyalty variables are standardized with a mean of zero and a standard deviation of one so that the coefficients of these variables may be directly comparable. A table showing the covariates used in this model and other models is shown in Table 7. All multiplicative variables and their constituent elements are mean-centered to minimize the ill-effects of multicollinearity. Descriptive statistics regarding the sample used in the purchase timing model are given in Table 6.

Testing Purchase Timing Hypotheses

We have hypothesized that in the main attitudinal loyals are more price sensitive than behavioral loyals (H7). This is a hypothesis about the "main effects" of the dimensions of loyalty. To test H7 we perform a joint

Wald χ^2 test to determine if the $PCBLOYAL_{i,t}$ coefficient is significantly larger than the $PCALOYAL_{i,t}$ coefficient.

We have also hypothesized that behavioral loyals are more coupon sensitive than attitudinal loyals (H8). In order to test H8 we perform a joint Wald χ^2 to determine if the $CPBLOYAL_{i,t}$ coefficient is significantly larger than the $CPALOYAL_{i,t}$ coefficient. A finding of statistical significance provides support for H8.

Table 6
Descriptive Statistics on sample used to model Purchase Timing Behavior (16,272 observations)

Variable	Mean	Standard Deviation	Minimum	Median	Maximum
Mean inter-purchase time	24.00 days	20.89	5.00	17.00	178.00
Price change	0.02 cents/oz.	6.32	-32.80	0.00	30.75
Coupon use[27]	0.73	0.45	0.00	1.00	1.00
Category attitudinal loyalty	0.66	0.21	0.00	0.61	1.74
Category behavioral loyalty	-0.92	0.32	-1.56	-0.97	0
Purchase quantity at *t*-1	20.77 oz.	14.05	5.50	16.00	264.00
Estimated Inventory	37.88 oz.	20.13	5.50	33.58	264.00
Household size	3.28 persons	1.37	1	3	10
ADCR[28]	1.49 oz./day	1.13	0.07	1.19	7.39

[27] Coupon use is a dummy variable; 1 = coupon used in purchase, 0 = otherwise.
[28] ADCR = Average daily consumption rate.

Modeling of Consumption Rate Behavior and Hypotheses Testing

In this section we detail the regression model used to understand consumption rate behavior and show how our consumption rate hypotheses are to be tested. Consumption rate behavior has not been extensively modeled in the literature and this is the first consumption rate model (to the best of our knowledge) that includes brand loyalty and its interactions with marketing actions as predictor variables.

Consumption Rate Model

We model the consumption rate of salty snacks for the same households used in the purchase quantity and purchase timing models. The consumption rate for salty snacks for consumption spells beginning and ending in the second year of scanner data is modeled using a multiple regression model. There are 16,272 consumption spells in our sample. We use Chandon and Wansink's (1996) index of household consumption, CI_t^h as our dependent measure. Higher CI_t^h values indicate consumption acceleration. CI_t^h is specified as,

$$CI_t^h = \ln\left(\frac{CCR_t^h}{\overline{C}^h}\right) \text{ with } CCR_t^h = \frac{Cons_t^h}{D_t^h - D_{t-1}^h}$$

where

CI_t^h = Consumption index for household h for consumption period t that begins at t-1 and ends at t,

CCR_t^h = Current consumption rate for household h for consumption period t that begins at t-1 and ends at t,

$Cons_t^h$ = Consumption by h beginning at t-1 and ending at t,

$D_t^h - D_{t-1}^h$ = Number of days between purchase at *t-1* and *t* by household *h*,[29] and

$\overline{C}^h$ = Average daily consumption rate (from calibration period).

Our consumption rate model is:

$$\begin{aligned} CI_t^h &= \beta_0 + \beta_1 NETPRICE_{t-1}^h + \beta_2 CPNUSED_{t-1}^h + \beta_3 CAL^{*h} \\ &+ \beta_4 CBL^h + \beta_5 CCL^h + \beta_6 PRALOYAL_{t-1}^h + \beta_7 PRBLOYAL_{t-1}^h \\ &+ \beta_8 PRCLOYAL_{t-1}^h + \beta_9 CPALOYAL_{t-1}^h + \beta_{10} CPBLOYAL_{t-1}^h \\ &+ \beta_{11} CPCLOYAL_{t-1}^h + \beta_{12} LNPQ_{t-1}^h + \beta_{13} LNINV_t^h + \varepsilon_t^h \end{aligned}$$

where

CI_t^h = Consumption index for household *h* for consumption period *t* that begins at *t*-1 and ends at *t*,

$NETPRICE_{t-1}^h$ = Net price/oz. paid by *h* at *t-1*,

$CPNUSED_{t-1}^h$ = Dummy variable (0/1) for coupon use by *h* at *t*-1,

CAL^{*h} = Category attitudinal loyalty,

CBL^h = Category behavioral loyalty,

$CCL^h = CAL^{*h} \times CBL^h$,

$PRALOYAL_{t-1}^h = NETPRICE_{t-1}^h \times CAL^{*h}$,

$PRBLOYAL_{t-1}^h = NETPRICE_{t-1}^h \times CBL^h$,

$PRCLOYAL_{t-1}^h = NETPRICE_{t-1}^h \times CCL^h$,

$CPALOYAL_{t-1}^h = CPNUSED_{t-1}^h \times CAL^{*h}$,

$CPBLOYAL_{t-1}^h = CPNUSED_{t-1}^h \times CBL^h$,

$CPCLOYAL_{t-1}^h = CPNUSED_{t-1}^h \times CCL^h$,

$LNPQ_{t-1}^h$ = ln(purchase quantity for *h* at *t*-1),

$LNINV_t^h$ = ln(estimated household inventory for *h* at *t*),

ε_t^h = error term, and

β_i = coefficients to be estimated.

A table showing the covariates used in this model and other models is shown in Table 7.

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[29] We assume that households consume their entire inventory after 42 days hence $D_t^h - D_{t-1}^h$ is truncated at 42 days.

Testing Consumption Rate Hypotheses

It is hypothesized that in the main attitudinal loyals are more price sensitive than behavioral loyals (H9). The testing of H9 involves performing a joint *F*-test to determine if the $PRBLOYAL^{h}_{t-1}$ coefficient is significantly larger than the $PRALOYAL^{h}_{t-1}$ coefficient.

Finally, it was hypothesized that behavioral loyals are more coupon sensitive than attitudinal loyals (H10). The testing of this hypothesis follows in the same fashion as others. We perform a joint *F*-test to determine if the $CPBLOYAL^{h}_{t-1}$ coefficient is significantly larger than the $CPALOYAL^{h}_{t-1}$ coefficient. A finding of statistical significance provides support for H10.

Summary

We have described the planned research methodology for our study. We have discussed how the data will be collected, the models that are developed to represent various brand behaviors, and consequently how these models are used to test our hypothesis. The four behaviors we examined are modeled using linear regression-based methodologies and our hypotheses are tested by examination of coefficients in our regression models. Next we present the results of our analysis.

Table 7
Covariates used in models

Covariate	Model			Comment
	Purchase Quantity	Purchase Timing	Consumption rate	
Average purchase quantity	✓			We expect a positive relationship between average purchase quantity and current purchase quantity. This covariate was used in Gupta's (1988) study.
Inventory	✓	✓	✓	This covariate has been used in Gupta's (1988) research. Households with more inventory may be motivated to purchase less product. But on the other hand, households with high inventory may be high volume or frequent purchasers. Research by Chandon and Wasnick (1996) and Ailawadi and Neslin (1998) suggests increased consumption in the presence of more inventory.
Inter-purchase time	✓			The longer the time since the last purchase the higher the purchase volume. Covariate used in Gupta's (1988) study.

Table 7 (cont.)
Covariates used in models

Covariate	Model			Comment
	Purchase Quantity	Purchase Timing	Consumption Rate	
Size of household	✓	✓		Size of household covariates was used in the Gupta (1988) and Vilcassim and Jain (1991) studies. We expect large households to make bigger purchases. Large households may need to purchase more frequently. In the consumption rate model the dependent variable is the household consumption index that implicitly accounts for the effect of household size. Hence, size of household in the consumption rate model would be a redundancy.
Usage rate	✓	✓		This covariate accounts for differences in preference for salty snacks. We expect heavy user households to make larger purchases and to purchase more frequently.
Size of shopping trip	✓			This variable accounts for the type of shopping trip where salty snacks are purchased. We expect that more salty snacks will be purchased during large shopping trips.

Table 7 (cont.)
Covariates used in models

Covariate	Model			Comment
	Purchase Quantity	Purchase Timing	Consumption Rate	
Proportion of purchase that is couponed	✓			This covariate accounts for different types of coupon purchases. For trial purposes, shoppers may be using "buy-one-get-one" coupons. In other instances where large purchases are been made shoppers may be using few, if any, coupons.
Mean inter-purchase time		✓		Prior studies (e.g. Helsen and Schmittlein 1993) have found this variable to be a significant predictor of purchase timing.
Prior purchase quantity		✓	✓	Covariate used Krishnamurthi, Mazumdar, and Raj (1992) study. We expect households with large prior purchases will delay their next purchase. We also want to control for the effect of prior purchase on consumption independent of inventory, which may contain several prior purchases.

CHAPTER 6

RESULTS

This chapter presents the results of our statistical analysis and hypothesis tests. We discuss our models and report on the outcomes of the testing of our hypotheses.

Brand choice models

The multinomial logit of brand choice for all households is shown in Table 8. A market share model that consists only of brand-specific constants is taken as our null or base model, $\rho^2 = 0$.[30] We have no theoretical interest in the brand-specific constants. The explanatory power of our model is quite good with $\rho^2 = 0.54$ and represents a significant improvement in fit over the null model ($\chi^2 = 95{,}671$; $d.f. = 8$, $p < 0.0001$). An examination of the deviance residuals of the model suggests that the assumptions of the model were satisfactorily met.

The results of our model support our hypotheses. All of the coefficients of price's interaction with the dimensions of loyalty are positive and significant indicating that shoppers are less price sensitive to the brands to which they are attitudinally loyalty, behaviorally loyal, and truly loyal (i.e., both attitudinally and behaviorally loyal). H1, H2, and H3 are strongly supported.

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[30] $\rho^2 = 1 - L(X)/L_0$ where $L(X)$ is the log likelihood of the calibrated model with explanatory variables, X, and L_0 is the log likelihood of the null model, and is analogous to R^2 of OLS regression models. However, ρ^2 tends to have lower values even for models with good fit.

Table 8
Brand Choice Model: Multinomial Logit for all households

Variable	Parameter Estimate	Wald χ^2	$p > \chi^2$	Risk Ratio
Frito-Lay small	3.167	2,721.00	0.0001	23.724
Wegman small	0.168	5.45	0.0195	1.183
Wise small	2.537	2,092.00	0.0001	12.645
Other small	2.063	1,888.00	0.0001	7.868
Frito-Lay medium	0.908	316.88	0.0001	2.480
Snyder medium	-1.421	610.78	0.0001	0.242
Wegman medium	-2.833	2,818.00	0.0001	0.059
Wise medium	0.189	7.51	0.0061	1.208
Frito-Lay large	-0.333	45.32	0.0001	0.717
Snyder large	-5.970	6,105.00	0.0001	0.003
Wegman large	-1.628	860.97	0.0001	0.196
Other large	-6.354	6,311.00	0.0001	0.002
$SIZLOYAL_i^H$	0.628	158.76	0.0001	1.875
$ATTLOYAL_i^H$	0.536	745.40	0.0001	1.709
$BEHLOYAL_i^H$	0.438	1,108.00	0.0001	1.549
$COMLOYAL_i^H$	-0.060	24.66	0.0001	0.942
$PRICE_i^t$	-13.530	21,262.00	0.0001	0.000
$PRICEATT_i^{H,t}$	2.357	1,018.00	0.0001	10.562
$PRICEBEH_i^{H,t}$	1.396	771.22	0.0001	4.041
$PRICECOM_i^{H,t}$	0.143	10.15	0.0014	1.154

Notes:
1. Model without covariates: -2 log likelihood = 195,513.016.
2. Model with covariates: -2 log likelihood = 81,113.276.
3. Model χ^2 = 114,399.7, *d.f.* = 20, $p < 0.0001$.
4. First 12 variables are brand-specific constants; base brand size is "Other medium".
5. Model based on 34,013 choice observations.

Tables 9-12 show the brand choice model for each loyalty segment. The price coefficient for latent loyals is -14.54 vs. -12.85 for spurious loyals. This indicates that latent loyals are more price sensitive than spurious loyals providing evidence supporting H4. The price coefficient for true loyals is -13.63, indicating that true loyals are less price sensitive than latents but more price sensitive than spurious loyals. We note that non-loyals with a price coefficient of -13.76 are just about as price sensitive as true loyals. In the case of true loyals and non-loyals both loyalty dimensions are consistent with one another. However, the loyalty dimensions are inconsistent in the case of latent and spurious loyals. It appears that when attitudinal loyalty is more dominant than behavioral loyalty (as is the case with latent loyals) then price sensitivity is high. When behavioral loyalty is more dominant than behavioral loyalty (as is the case with spurious loyals) then price sensitivity is low. When neither dimension of loyalty dominates the other (as is the case with non-loyals and true loyals) then price sensitivity is moderate.

An examination of the various brand choice models reveals interesting differences in the relative significance of the dimensions of brand loyalty. The relative magnitudes of the *t*-statistics, given a fixed sample size, provide an indication of the explanatory power of the variables in the model (Guadagni and Little 1983). By taking the square root of the Wald χ^2 statistic we obtain *t*-statistics. In the choice model for all households the *t*-value for attitudinal loyalty, $ATTLOYAL_i^H$, is less than

the *t*-value for behavioral loyalty, $BEHLOYAL_i^H$, 27.3 vs. 33.3, suggesting that for most households the effect of behavioral loyalty on choice behavior is greater than the effect of attitudinal loyalty. When the choice models for the individual segments are examined we find that the *t*-value of the behavioral loyalty coefficient is larger than the *t*-value of the attitudinal loyalty coefficient for all segments expect for latent loyals. For latent loyals the *t*-value of the coefficient for attitudinal loyalty is larger than the *t*-value for the coefficient for behavioral loyalty (17.5 vs. 9.6). For all of the choice models we note that the *t*-value of the coefficient representing true loyalty, $COMLOYAL_i^H$ (the interaction of attitudinal and behavioral loyalty), is much smaller than the *t*-values of the attitudinal and behavioral dimensions of brand loyalty.

For all segments, except the latent segment, behavioral loyalty is more determinative of brand choice than attitudinal loyalty. This is not surprising given the product category. Salty snacks command a small share of a household's food budget. Purchasing and consuming salty snacks poses little risks, financial or otherwise. For other purchases involving more risk and where the product category is intrinsically more involving attitudinal loyalty may play a more significant role. Our finding that attitudinal loyalty, even for a low involvement product like salty snacks, is more important than behavioral loyalty for a critical segment of consumers (latents) strongly suggests that the attitudinal dimension of loyalty plays no small role in purchase behavior.

Table 9
Brand Choice Model: Multinomial Logit for Non-Loyal segment

Variable	Parameter Estimate	Wald χ^2	$p > \chi^2$	Risk Ratio
Frito-Lay small	3.495	1,038.00	0.0001	32.959
Wegman small	0.236	4.08	0.0433	1.267
Wise small	2.643	814.68	0.0001	14.049
Other small	2.265	797.72	0.0001	9.636
Frito-Lay medium	0.960	112.53	0.0001	2.613
Snyder medium	-1.465	218.64	0.0001	0.231
Wegman medium	-2.823	1,005.00	0.0001	0.059
Wise medium	0.202	3.04	0.0812	1.223
Frito-Lay large	-0.464	27.90	0.0001	0.629
Snyder large	-6.217	2,035.00	0.0001	0.002
Wegman large	-1.530	276.35	0.0001	0.217
Other large	-6.189	2,248.00	0.0001	0.002
$SIZLOYAL_i^H$	0.664	45.25	0.0001	1.942
$ATTLOYAL_i^H$	0.508	157.23	0.0001	1.662
$BEHLOYAL_i^H$	0.443	371.76	0.0001	1.557
$COMLOYAL_i^H$	-0.070	7.11	0.0076	0.932
$PRICE_i^t$	-13.761	7,598.00	0.0001	0.000
$PRICEATT_i^{H,t}$	2.384	233.35	0.0001	10.849
$PRICEBEH_i^{H,t}$	1.290	209.33	0.0001	3.631
$PRICECOM_i^{H,t}$	0.129	1.57	0.2103	1.138

Notes:
1. Model without covariates: -2 log likelihood = 68,930.248.
2. Model with covariates: -2 log likelihood = 28,157.782.
3. Model χ^2 = 40,772.47, *d.f.* = 20, $p < 0.0001$.
4. First 12 variables are brand-specific constants; base brand size is "Other medium".
5. Model based on 12,133 choice observations.

Table 10
Brand Choice Model: Multinomial Logit for Spurious segment

Variable	Parameter Estimate	Wald χ^2	$p > \chi^2$	Risk Ratio
Frito-Lay small	3.117	657.32	0.0001	22.571
Wegman small	0.180	1.43	0.2322	1.197
Wise small	2.690	511.21	0.0001	14.727
Other small	2.238	528.30	0.0001	9.373
Frito-Lay medium	1.003	94.66	0.0001	2.726
Snyder medium	-1.404	129.04	0.0001	0.246
Wegman medium	-2.749	642.55	0.0001	0.064
Wise medium	0.085	0.31	0.5771	1.089
Frito-Lay large	-0.066	0.43	0.5109	0.937
Snyder large	-5.698	1,337.00	0.0001	0.003
Wegman large	-1.456	167.26	0.0001	0.233
Other large	-6.319	1,539.00	0.0001	0.002
$SIZLOYAL_i^H$	0.627	51.14	0.0001	1.871
$ATTLOYAL_i^H$	0.510	153.40	0.0001	1.665
$BEHLOYAL_i^H$	0.435	330.57	0.0001	1.545
$COMLOYAL_i^H$	-0.020	0.66	0.4150	0.980
$PRICE_i^t$	-12.854	5,228.00	0.0001	0.000
$PRICEATT_i^{H,t}$	2.137	186.77	0.0001	8.478
$PRICEBEH_i^{H,t}$	1.731	377.60	0.0001	5.649
$PRICECOM_i^{H,t}$	0.080	0.82	0.3659	1.083

Notes:
1. Model without covariates: -2 log likelihood = 52,992.396.
2. Model with covariates: -2 log likelihood = 21,229.194.
3. Model χ^2 = 31,763.20, *d.f.* = 20, $p < 0.0001$.
4. First 12 variables are brand-specific constants; base brand size is "Other medium".
5. Model based on 9,146 choice observations.

Table 11
Brand Choice Model: Multinomial Logit for Latent segment

Variable	Parameter Estimate	Wald χ^2	$p > \chi^2$	Risk Ratio
Frito-Lay small	2.686	429.67	0.0001	14.676
Wegman small	0.373	6.21	0.0127	1.452
Wise small	2.752	555.70	0.0001	15.673
Other small	1.860	325.90	0.0001	6.426
Frito-Lay medium	0.713	42.51	0.0001	2.040
Snyder medium	-1.331	125.70	0.0001	0.264
Wegman medium	-2.718	573.88	0.0001	0.066
Wise medium	0.478	11.72	0.0006	1.613
Frito-Lay large	-0.450	18.01	0.0001	0.638
Snyder large	-5.997	1,467.00	0.0001	0.002
Wegman large	-1.654	189.30	0.0001	0.191
Other large	-6.488	1,388.00	0.0001	0.002
$SIZLOYAL_i^H$	0.737	37.99	0.0001	2.091
$ATTLOYAL_i^H$	0.709	304.61	0.0001	2.033
$BEHLOYAL_i^H$	0.328	92.56	0.0001	1.388
$COMLOYAL_i^H$	0.006	0.04	0.8400	1.006
$PRICE_i^t$	-14.541	4,588.00	0.0001	0.000
$PRICEATT_i^{H,t}$	3.286	415.72	0.0001	26.728
$PRICEBEH_i^{H,t}$	0.846	41.45	0.0001	2.330
$PRICECOM_i^{H,t}$	0.514	24.33	0.0001	1.673

Notes:
1. Model without covariates: -2 log likelihood = 42,324.838.
2. Model with covariates: -2 log likelihood = 17,665.726.
3. Model $\chi^2 = 24{,}659.11$, $d.f. = 20$, $p < 0.0001$.
4. First 12 variables are brand-specific constants; base brand size is "Other medium".
5. Model based on 7,415 choice observations.

Table 12
Brand Choice Model: Multinomial Logit for True loyals segment

Variable	Parameter Estimate	Wald χ^2	p value for Wald χ^2	Risk Ratio
Frito-Lay small	2.972	452.83	0.0001	19.527
Wegman small	-0.369	3.63	0.0566	0.692
Wise small	2.024	190.89	0.0001	7.566
Other small	1.692	227.65	0.0001	5.430
Frito-Lay medium	0.729	38.65	0.0001	2.072
Snyder medium	-1.612	143.27	0.0001	0.200
Wegman medium	-3.314	597.44	0.0001	0.036
Wise medium	-0.181	1.08	0.2987	0.834
Frito-Lay large	-0.469	16.50	0.0001	0.625
Snyder large	-6.537	1,117.00	0.0001	0.001
Wegman large	-2.294	251.61	0.0001	0.101
Other large	-7.022	1,024.00	0.0001	0.001
$SIZLOYAL_i^H$	0.555	27.79	0.0001	1.742
$ATTLOYAL_i^H$	0.478	128.27	0.0001	1.613
$BEHLOYAL_i^H$	0.466	198.81	0.0001	1.593
$COMLOYAL_i^H$	-0.116	19.54	0.0001	0.891
$PRICE_i^t$	-13.634	2,978.00	0.0001	0.000
$PRICEATT_i^{H,t}$	2.352	191.17	0.0001	10.506
$PRICEBEH_i^{H,t}$	1.453	119.02	0.0001	4.277
$PRICECOM_i^{H,t}$	0.063	0.42	0.5193	1.065

Notes:
1. Model without covariates: -2 log likelihood = 31,265.535.
2. Model with covariates: -2 log likelihood = 13,597.161.
3. Model χ^2 = 17,668.37, $d.f.$ = 20, $p < 0.0001$.
4. First 12 variables are brand-specific constants; base brand size is "Other medium".
5. Model based on 5,319 choice observations.

Relation of choice model findings to research objectives

It was a principal research objective of ours to understand the brand behaviors of different segments of loyals. In this section we point out these differences with respect to choice behavior.

We find latent loyals to be the most price sensitive segment and spurious loyals to be the least price sensitive segment in the brand choice decision. We also find differences among the segments in their brand choices as shown in Table 13.

Table 13 shows a sharp dichotomy in the brand choice of shoppers with high behavioral loyalty (spurious and true loyals) versus those with low behavioral loyalty (non-loyals and latents). The dominant brand is Frito-Lay. We observe that Frito-Lay's market share among behavioral loyals is about 50% (49% for spurious loyals and 50% for true loyals). Frito-Lay's success is clearly a function of the strong behavioral loyalty it is able to engender among shoppers. Frito-Lay's market share among shoppers who are not behaviorally loyals is less than 40%. The store brand, Wegman, is reasonably well positioned among shoppers with relatively little behavioral loyalty. Among these shoppers its market share is greater than 20%. Wegman's market share among behavioral loyals is less than 20%. Frito-Lay's market share is approximately thrice that of Wegmans among behavioral loyals (49% vs. 18% for spurious loyals and 50% vs. 15% for true loyals). Among shoppers who are not behaviorally loyal Frito-Lay's market share is about 50% greater than Wegmans.

For all segments we observe that "large" is the most popular brand size and "small" is the least popular brand size. It is interesting to note the market share of the Wise brand of salty snacks. Wise competes only with small and medium packages. Unlike other brands, Wise generates most of its sales from small packages. We observe that Wise is considerable less successful with behavioral loyals — market share less than 7% — but more successful with those who are not behaviorally loyals with a 50% higher market share of about 11%.

The market share dynamics of the Wise brand is in sharp contrast to that of Frito-Lay. Wise generates most of its sales from small packages and from shoppers who are not behaviorally loyal. Frito-Lay on the other hand generates most of its sales from large packages and from shoppers who are behaviorally loyal. Wise and Frito-Lay are pursuing divergent strategies. Currently Frito-Lay's strategy appears to be more successful.

In the brand choice decision latent loyals are most price sensitive and spurious loyals are the least price sensitive. Spurious loyals choose Frito-Lay more often than latent loyals. Latents on the other hand choose the Wegman and Wise brands more often than spurious loyals.

Table 13A
Market Share (in units) for Non-Loyals

Brand	Small	Medium	Large	Total
Frito-Lay	8.33%	8.26%	19.21%	35.80%
Snyder		3.38%	3.07%	6.45%
Wegman	1.46%	8.01%	12.88%	22.35%
Wise	9.10%	1.74%		10.84%
Other	10.87%	11.62%	2.06%	24.55%
Total	29.76%	33.01%	37.23%	100.00%

Table 13B
Market Share (in units) for Spurious Loyals

Brand	Small	Medium	Large	Total
Frito-Lay	9.51%	9.17%	30.18%	48.86%
Snyder		2.30%	2.47%	4.77%
Wegman	1.12%	5.43%	11.32%	17.87%
Wise	5.74%	1.02%		6.76%
Other	9.03%	11.12%	1.60%	21.75%
Total	25.40%	29.04%	45.56%	100.00%

Table 13C
Market Share (in units) for Latent Loyals

Brand	Small	Medium	Large	Total
Frito-Lay	9.86%	9.06%	20.98%	39.91%
Snyder		3.61%	3.47%	7.08%
Wegman	1.51%	7.44%	11.41%	20.36%
Wise	8.89%	2.24%		11.13%
Other	8.20%	11.79%	1.54%	21.52%
Total	28.46%	34.15%	37.40%	100.00%

Table 13D
Market Share (in units) for True Loyals

Brand	Small	Medium	Large	Total
Frito-Lay	13.37%	11.37%	25.63%	50.37%
Snyder		3.20%	2.27%	5.47%
Wegman	0.96%	5.70%	8.65%	15.30%
Wise	4.59%	1.80%		6.39%
Other	8.37%	12.69%	1.41%	22.47%
Total	27.28%	34.76%	37.96%	100.00%

Purchase quantity model

The results of our purchase quantity model are given in Table 14. The fit of the model is good with an $R^2_{adj.}$ of 0.47. Diagnostic checks of the residuals and the variance inflation factors (none of which were above ten) indicated that neither heteroscedasticity nor multicollinearity were present to any significant degree. It appears that the assumptions of the model are reasonably met. Both marketing actions variables, price and coupon use ($NETPRICE_t^h$ and $CPNUSED_t^h$), are significant and in the expected direction. The $NETPRICE_t^h$ coefficient is negative, indicating that purchase quantity decreases in response to price increases, ceteris paribus. Such a finding is consistent with the economic law of demand: There is an inverse relationship between price and quantity demanded. The $CPNUSED_t^h$ coefficient is positive indicating that coupon use is consistent with larger quantity purchases, ceteris paribus.

Table 12 indicates that all brand loyalty variables are statistically significant, that is, attitudinal loyalty, behavioral loyalty, and true loyalty (the interaction of attitudinal and behavioral loyalty), are significant predictors of purchase quantity. The coefficients for the interaction of price and attitudinal loyalty ($PRALOYAL_t^h$) and price and behavioral loyalty ($PRBLOYAL_t^h$) are both positive, indicating that attitudinal and behavioral loyals are less price sensitive than other shoppers, ceteris

paribus.[31] $PRBLOYAL_t^h$ is significantly larger than $PRALOYAL_t^h$ ($F_{1, 17424}$ = 14.63; $p < 0.0001$) which provides support for H5 that the main effect of behavioral brand loyalty that is associated with less price sensitivity is larger than the main effect of attitudinal loyalty that is associated with less price sensitivity. That is, attitudinal loyals are in the main more price sensitive than behavioral loyals. The $PRCLOYAL_t^h$ coefficient is negative and significant suggesting that the interaction of the dimensions of loyalty partially negates the "main effects" of the dimensions of loyalty on price sensitivity. The estimated price coefficient for non-loyals, spurious loyals, latent loyals, and true loyals is -0.96, -0.68, -0.83, and -0.73 respectively.[32] Latent loyals (for whom the attitudinal dimension of brand loyalty is stronger than the behavioral dimension) are more price sensitive than spurious loyals (for whom the behavioral dimension is stronger than the attitudinal dimension). True loyals (for whom both loyalty dimensions are strong) have a price sensitivity between that of latent and spurious loyals. Non-loyals are the most price sensitive segment in the purchase quantity decision.

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[31] The $NETPRICE_t^h$ coefficient is negative. If the $PRALOYAL_t^h$ and $PRBLOYAL_t^h$ variables were negative this would indicate greater sensitivity on the part of attitudinal and behavioral loyals. Our results show that both $PRALOYAL_t^h$ and $PRBLOYAL_t^h$ coefficients are positive; therefore, we interpret this to mean that an increase in attitudinal and behavioral loyalty is consistent with a reduction in price sensitivity.

[32] In estimating the price coefficients for the various segments we set "high loyalty" to be loyalty that is one standard deviation above the mean and "low loyalty" to be loyalty that is one standard deviation below the mean. These estimated coefficients are only representative of the sensitivity of the various segments. In principle each household has its own sensitivity to various marketing actions.

Our hypothesis with respect to coupon use is supported. The interaction of attitudinal loyalty and coupon use ($CPALOYAL_t^h$) is not significant. Behavioral loyalty's interaction with coupon use $CPBLOYAL_t^h$ is significant with a positive coefficient. Behavioral loyals are more coupon sensitive than attitudinal loyals ($F_{1,\ 17424} = 17.01$, $p < 0.0001$). Support is found for H6. The coefficient for the interaction of true loyalty (the interaction of attitudinal and behavioral loyalty) and coupon use ($CPCLOYAL_t^h$) and is negative and significant. The estimated coupon coefficient for non-loyals, spurious loyals, latent loyals, and true loyals is 0.89, 0.97, 0.85, and 1.02 respectively. Spurious loyals (for whom the behavioral dimension is stronger than the attitudinal dimension) are more price sensitive than latent loyals (for whom the attitudinal dimension of brand loyalty is stronger than the behavioral dimension). Interestingly, non-loyals (for whom both loyalty dimensions are weak) have a level of coupon sensitivity between that of latent and spurious loyals. True loyals are the most coupon sensitive segment in the purchase quantity decision.

Table 14
Regression model of Purchase Quantity

Variable	Parameter Estimate	Standard Error	*t* value	*p* value for |*t*|
Intercept	1.649	0.045	36.723	0.0001
$NETPRICE_t^h$	-0.799	0.015	-54.646	0.0001
$CPNUSED_t^h$	0.933	0.018	52.547	0.0001
CAL^{*h}	0.015	0.004	3.716	0.0002
CBL^h	0.032	0.004	8.476	0.0001
CCL^h	-0.013	0.004	-3.043	0.0023
$PRALOYAL_t^h$	0.021	0.013	1.680	0.0929
$PRBLOYAL_t^h$	0.093	0.014	6.505	0.0001
$PRCLOYAL_t^h$	-0.044	0.012	-3.571	0.0004
$CPALOYAL_t^h$	0.002	0.010	0.198	0.8433
$CPBLOYAL_t^h$	0.060	0.010	5.821	0.0001
$CPCLOYAL_t^h$	-0.022	0.010	-2.292	0.0219
$LNMEANPQ^h$	0.349	0.014	25.778	0.0001
$LNINV_t^h$	0.097	0.007	13.722	0.0001
$LNIPT_t^h$	0.007	0.004	1.871	0.0613
$NUMHH^h$	-0.001	0.003	-0.426	0.6704
$NUMATTINT^h$	-0.006	0.003	-2.122	0.0339
$NUMBEHINT^h$	-0.005	0.003	-1.577	0.1147
$NUMCOMINT^h$	-0.002	0.003	-0.688	0.4915
$HHPRICE_t^h$	0.005	0.011	0.412	0.6805
$HHCPN_t^h$	0.028	0.008	3.315	0.0009
$LNADCR^h$	0.035	0.013	2.689	0.0072
$URATTINT^h$	0.016	0.010	1.603	0.1089
$URBEHATT^h$	0.007	0.010	0.726	0.4680
$URCOMINT^h$	-0.035	0.012	-2.93	0.0034
$USEPRICE_t^h$	0.164	0.040	4.127	0.0001
$USECPN_t^h$	0.182	0.029	6.277	0.0001
$LN\_N\_S_t^h$	0.110	0.005	24.463	0.0001
$WGTCPN_t^h$	-1.015	0.018	-55.857	0.0001

Notes:

1. Dependent variable = Qty_t^h = ln(purchase quantity (in ounces) made by *h* at *t*).
2. $R^2 = 0.4678$, $R^2_{adj.} = 0.4669$, $F_{28,\ 17424} = 546.948$, $p < 0.0001$.

Relation of purchase quantity model findings to research objectives

Our principal research objectives were to understand the brand behaviors of different segments of loyals and to determine differences in sensitivity to marketing actions of these different segments. These objectives have been attained. Here we point out these differences with respect to purchase quantity behavior.

We find significant differences between attitudinal and behavioral loyals in their price and coupon sensitivity. Attitudinal loyals were found to be more price sensitive and behavioral loyals were found to be more coupon sensitive. Figure 5 shows expected changes in purchase quantity for different classes of shoppers in response to price changes.[33] Households purchase a smaller quantity of salty snacks when there is a price increase with latents reducing their purchase quantity most dramatically.

Figure 6 shows the change in purchase quantity for the different loyalty segments as a function of coupon use. Spurious loyals are most responsive to coupons in increasing the size of their purchase. Non-loyals are a unique segment in that they appear to use coupons to purchase smaller packages, ceteris paribus. Non-loyals differ in several key respects from other segments. As shown in Table 15, non-loyals

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[33] The purchase quantity amounts shown in the graphs are determined by taking representative values for the variables in the model and multiplying them by their appropriate coefficients in the regression model. The estimates given are for an "average household" under "average market conditions" with the exception of the changes indicated along the *X*-axis.

represent the largest households and are most prone to use coupons in terms of a) the percentage of time they use coupons when purchasing and b) the proportion of their purchase that is couponed. The higher the proportion of purchase that is couponed the smaller the purchase quantity, ceteris paribus. Hence it is not surprising that we find that on the average the purchase quantity of non-loyals for coupon purchases is slightly smaller than non-coupon purchases. This may suggest that coupons should be directed toward smaller as opposed to larger households.

Figure 5
Purchase quantity as a function of price

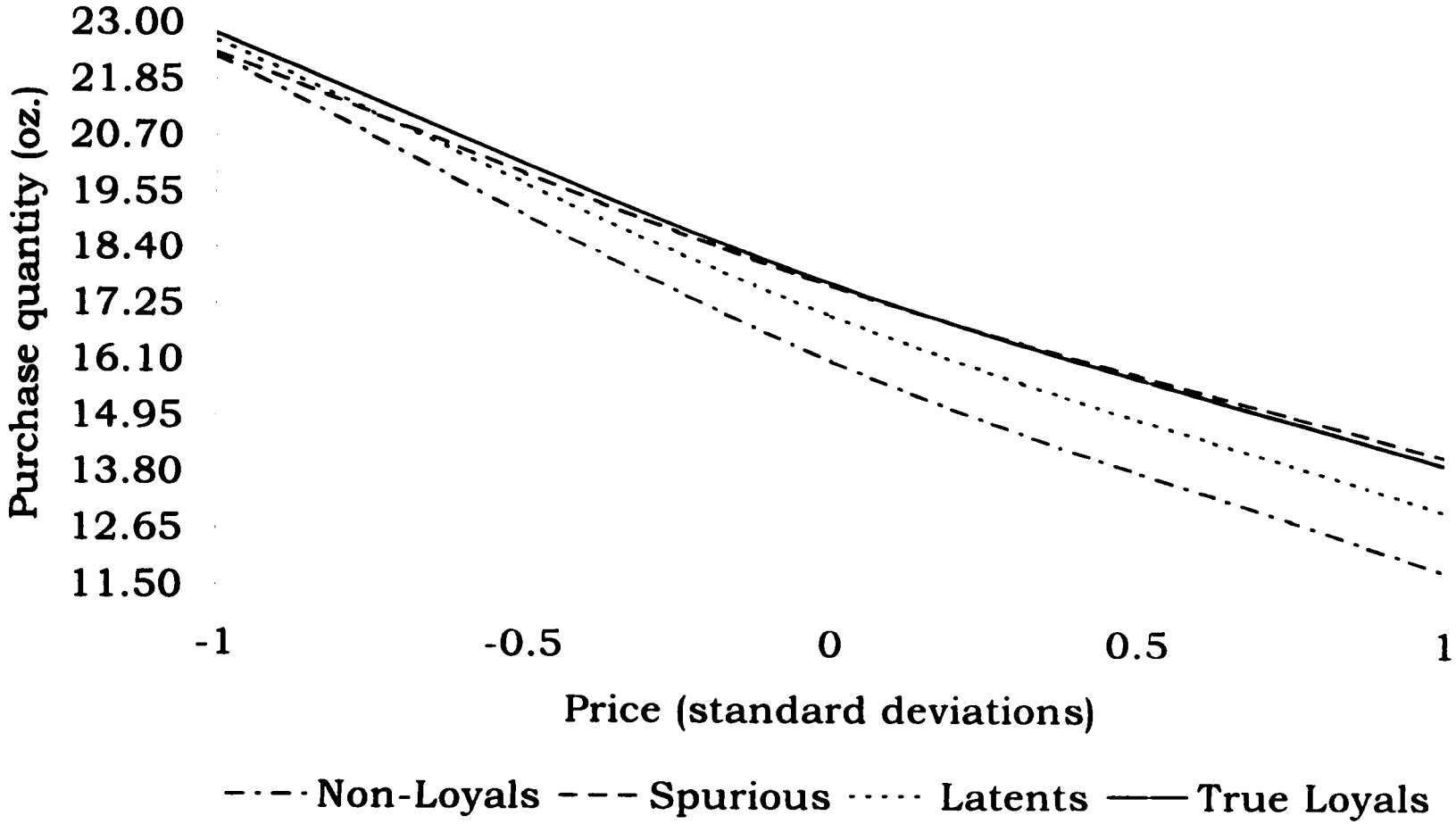


Figure 6
Purchase quantity as a function of coupon use

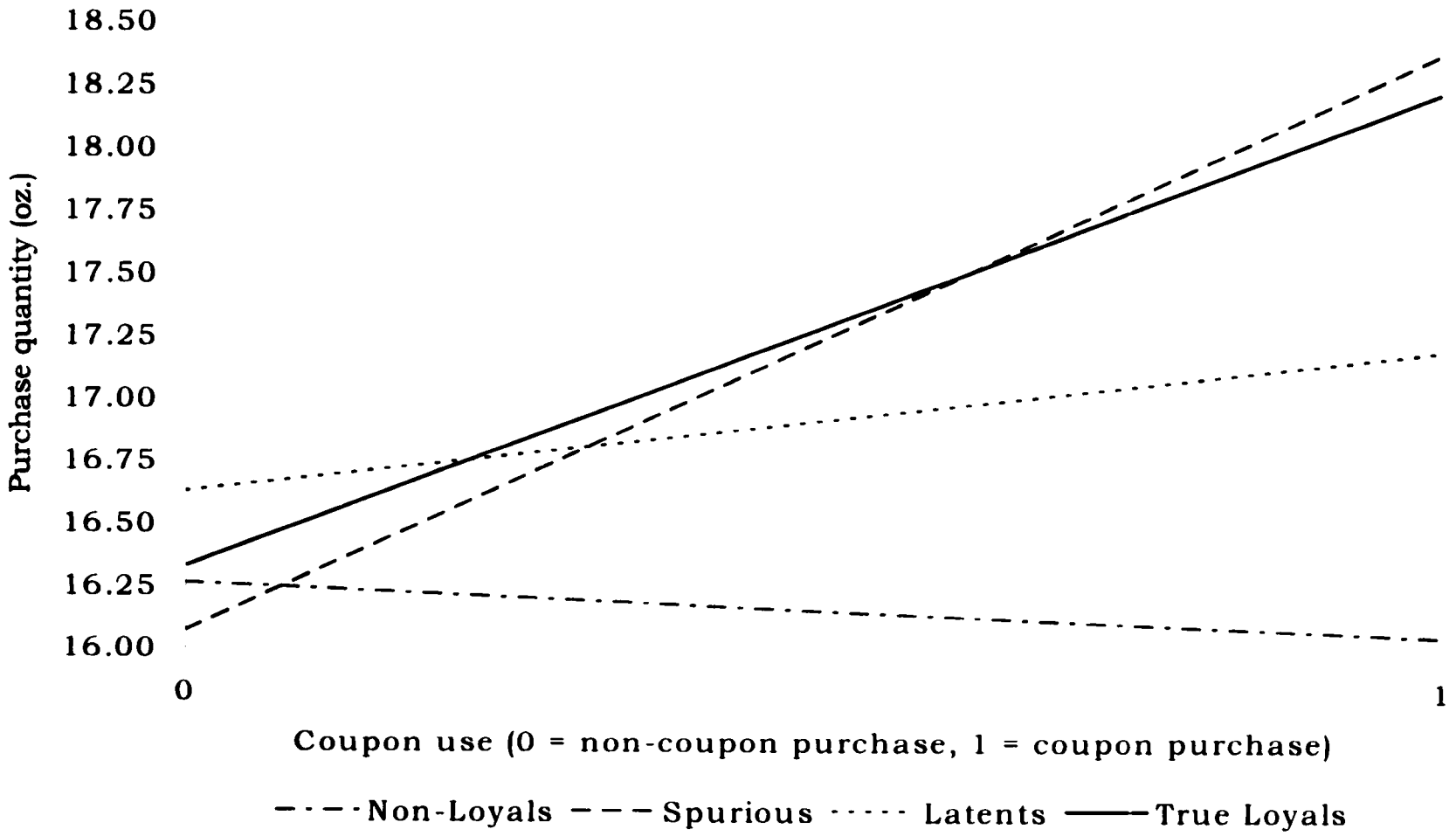


Table 15
Descriptive Statistics of loyalty segments

Variable	Non-Loyals	Spurious	Latents	True Loyals
Mean coupon use[34]	0.78	0.71	0.76	0.63
Mean number of persons in household	3.46	3.02	3.39	3.04
Proportion of purchase that is couponed	0.662	0.607	0.645	0.539

Figure 7 shows how the estimated purchase quantity for shoppers with increasing levels of attitudinal loyalty.[35] Higher attitudinal loyalty generally will bring about an increase in purchase quantity. However, the increase in purchase quantity is compounded when there is a concurrent increase in behavioral loyalty. If an increase in attitudinal loyalty is offset by a decrease in behavioral loyalty, the decrease in behavioral loyalty manifests itself in lower purchase quantities. This shows the importance of both dimensions of loyalty. Figure 8 shows the estimated purchase quantity for shoppers with different levels of behavioral loyalty. Any increase in behavioral loyalty results in higher purchase quantities. Striving to increase the attitudinal loyalty of consumers who are already behaviorally loyal may not be highly profitable given the small difference in purchase quantities between spurious and true loyals.

[34] Coupon use is a dummy variable; 1 = coupon used in purchase, 0 = otherwise.
[35] An increase in attitudinal loyalty would be measured and determined by a higher score for the attitudinal loyalty variable.

Figure 7
Purchase quantity as a function of attitudinal loyalty

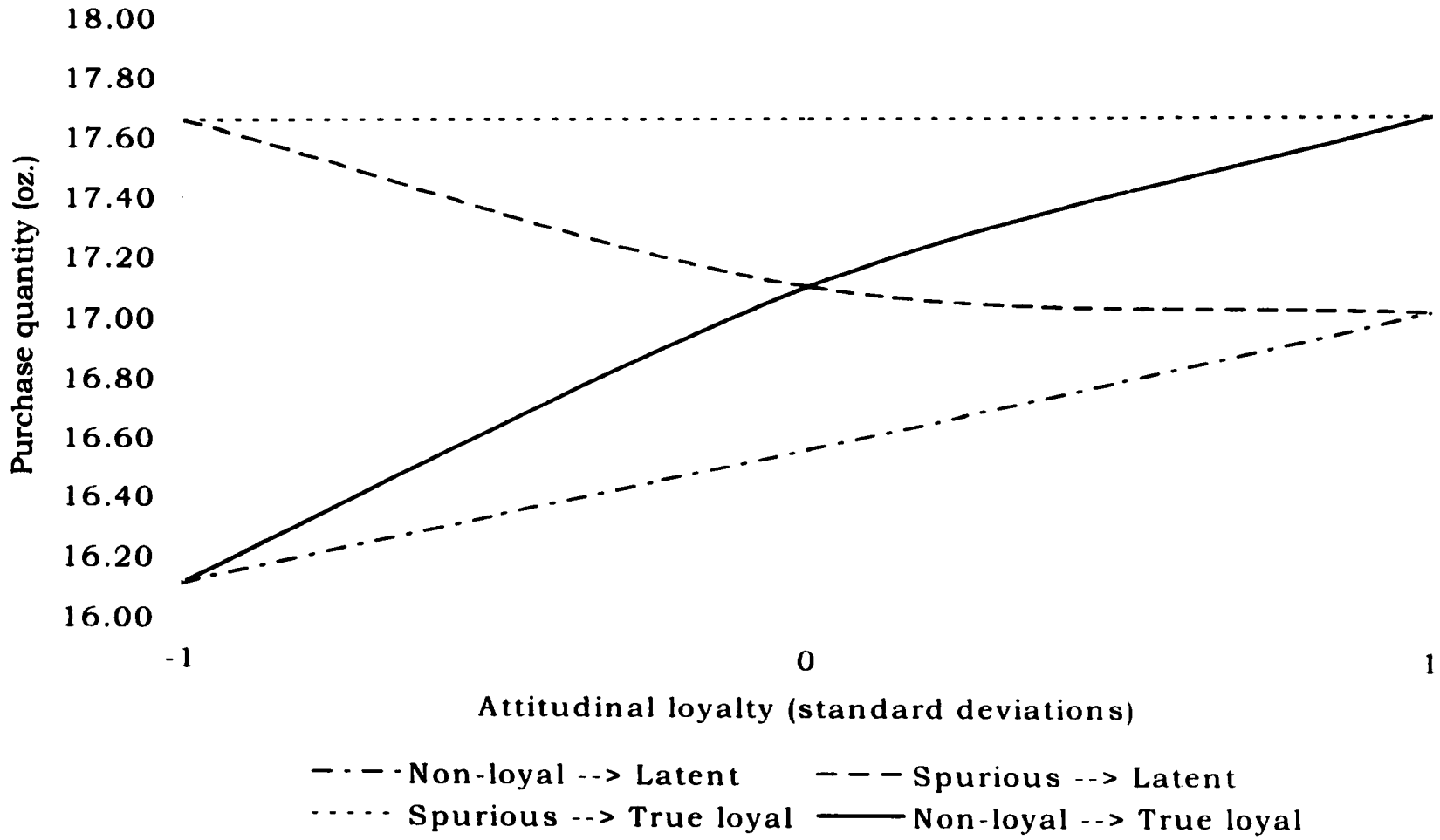
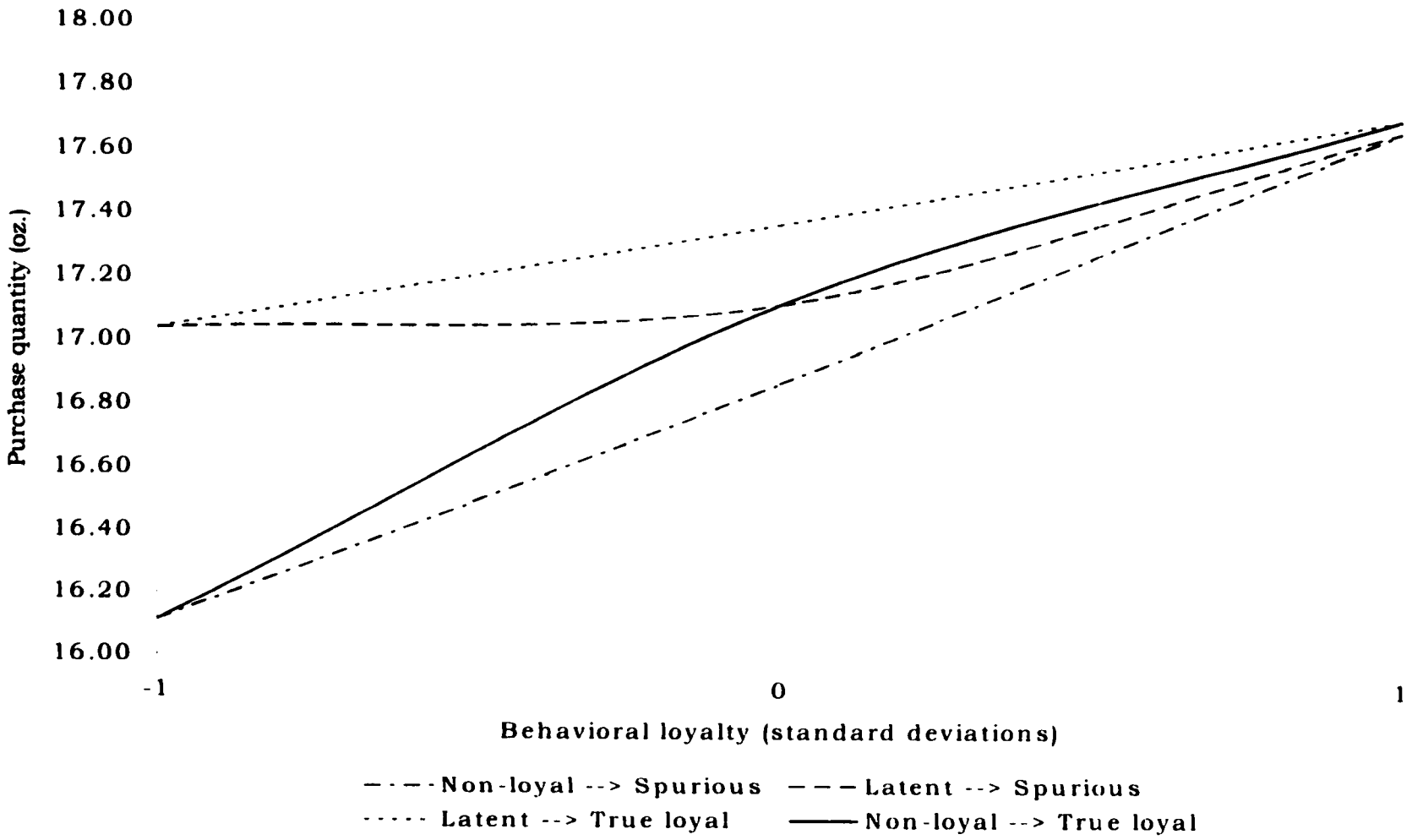


Figure 8
Purchase quantity as a function of behavioral loyalty



Purchase Timing Model

The results of our purchase timing model are given in Table 16. The fit of the model is significantly better than that of the null model (a model with no covariates, $\chi^2 = 3{,}477.681$, $d.f. = 23$, $p < 0.0001$); however, the model has little explanatory power ($\rho^2 = 0.013$). Several other purchase-timing studies have resulted in statistically significant models with low explanatory power (e.g., Gupta 1988, Vilcassim and Jain 1991). Much of the variation in inter-purchase time is not explained by marketing variables.

In our timing model as originally formulated, the price change variable, $PRICECHG_{i,t}$, was not significant ($p > 0.4$). Although we did not anticipate that $PRICECHG_{i,t}$ would be a potent predictor of purchase timing we did expect it to be statistically significant. An increase in price can be ordinarily expected to reduce the hazard rate of purchase. We find that when a variable representing purchase price, $NETPRICE_{i,t}$, is entered into the model, $PRICECHG_{i,t}$ is negative and significant as expected. The interpretation of this result is that a price reduction shortens purchase duration time (i.e., increases the hazard of purchase timing). The $NETPRICE_{i,t}$ coefficient is positive and significant. We interpret this result to suggest that the inter-purchase time for high-quality/high-price brands is shorter than that of low-price brands.

To assess if our model satisfied the its assumptions we examined the model's deviance residuals. Upon examining the deviance residuals of the model we observed that the residuals were not evenly spread over the range of the mean interpurchase time variable. The residuals were clustered toward lower values of the mean interpurchase time variable. Such a distribution suggests that in the model as currently formulated, the error terms may be a function of mean interpurchase time, i.e., the error terms are not well behaved.

The distribution of the error terms suggested that the mean interpurchase time variable might be positively skewed. Mean interpurchase time was found to have a skew measure value of 2.669. We transformed the mean interpurchase time variable by taking its natural log. This new variable, $LNMIPT_i$, has a skew measure value of 0.521. We reran our purchase timing model with $LNMIPT_i$ replacing $MEANIPT_i$. The results of the model are shown in Table 17. The fit of the new model is 12% better than the fit of the prior model (χ^2 = 3,891.694, *d.f.* = 23, $p < 0.0001$). This model like the prior model still has little explanatory power ($\rho^2 = 0.015$). An examination of the deviance residuals of this model suggests that the assumptions of the model were reasonably meet. The variable representing mean interpurchase time, $LNMIPT_i$, was found to be the most significant predictor in our purchase

timing model, a finding consistent with Gupta (1988). This revised model was used to test our hypotheses.

In our model none of the variables representing price changes and its interactions with any of the loyalty variables are significant. There is no significant difference between attitudinal and behavioral loyals with respect to their price sensitivity in purchase timing behavior ($\chi^2 = 0.979$, $d.f. = 1$, $p > 0.3$). H7 is not supported. We also fail to find a significant difference between attitudinal and behavioral loyals with respect to their coupon sensitivity in purchase timing behavior ($\chi^2 = 0.680$, $d.f. = 1$, $p > 0.4$). We fail to find support for H8. The coefficients for behavioral loyalty, CBL_i, and true loyalty, CCL_i, are both negative and significant. This suggests that behavioral loyals and true loyals delay their purchases more than other types of shoppers. We hasten to add and are careful to note that, whereas this result is statistically significant, the explanatory value of the model is very modest.

Hypotheses testing based on the original model results leads to the same conclusions. Neither H7 nor H8 are supported; that is, there is no significant difference between attitudinal and behavioral loyals with respect to their sensitivity to the marketing actions of price changes and coupons. Both models provide similar pictures of purchase timing in terms of which variables are significant in predicting purchase timing behavior.

The transformation of the coefficients in the hazard rate model, as suggested by Allision (1995), $100\times (\exp(\beta_i)-1)$, facilities a useful interpretation of the coefficients in the hazard model. When transformed in this manner the coefficients can be given a pseudo-elasticity interpretation. The transformation indicates the percentage change in the hazard rate for a unit change in the corresponding explanatory variable. Using this transformation we obtain an elasticity coefficient for the $PRICECHG_{i,t}$ variable of -7.53. That is, a 1% price hike reduces the hazard rate of purchase by almost 8% percent. This is a fairly powerful indication that price reductions in the main are able to provoke purchase timing acceleration. The baseline hazard function is shown in Figure 9. It shows that the hazard rate of purchase is an increasing function of time.

Although greater than half of the coefficients in our purchase-timing model are significant, none of our hypotheses are supported. There are many factors that may affect the purchase timing decision for salty snacks. Salty snacks are somewhat of an impulse good and in-store merchandising may play a very significant role in affecting purchase timing. However, we do not have data on this type of activity. We also note that the median inter-purchase period is 13 days (one day short of a fortnight). Perhaps for a critical mass of shoppers salty snacks may be purchased on a routine basis. Also the timing of salty snack purchases may be greatly affect by circumstances beyond the marketers' control. For instance, personal or family celebrations may be a major force

relating to the timing of the purchasing of salty snacks. In sum, many factors not accounted for in the model may affect purchase timing. The results of our model simply indicate that for the salty snack product category purchase timing models fail to capture a significant amount of the variation in purchase timing. Though we find several variables (e.g., average interpurchase time, purchase quantity, and household inventory) to be very significant predictors of purchase timing the marketing actions have a much less significant impact. This finding is consistent with that of other purchase studies (e.g., Gupta 1988; Jain and Vilcassim 1991; Vilcassim and Jain 1991).

Table 16
Purchase Timing Model: Cox's proportional hazard model
(Original model)

Variable	Parameter Estimate	Wald χ^2	p value for Wald χ^2	Risk Ratio
$MEANIPT_i$	-0.009	152.58	0.0001	0.991
$PRICECHG_{i,t}$	-0.075	6.08	0.0137	0.927
$CPNUSED_{i,t}$	-0.010	0.14	0.7057	0.991
CAL^*_i	0.003	0.11	0.7377	1.003
CBL_i	-0.077	69.77	0.0001	0.926
CCL_i	-0.059	31.85	0.0001	0.942
$PCALOYAL_{i,t}$	0.011	0.21	0.6436	1.011
$PCBLOYAL_{i,t}$	-0.023	0.85	0.3565	0.977
$PCCLOYAL_{i,t}$	0.034	2.05	0.1527	1.034
$CPALOYAL_{i,t}$	0.001	0.00	0.9656	1.001
$CPBLOYAL_{i,t}$	-0.031	2.16	0.1421	0.970
$CPCLOYAL_{i,t}$	-0.039	4.11	0.0426	0.962
$LNPQ_{i,t-1}$	-0.393	343.34	0.0001	0.675
$LNINV_{i,t}$	0.384	261.58	0.0001	1.468
$NUMHH_i$	-0.002	0.10	0.7571	0.998
$HHATTINT_i$	-0.016	4.99	0.0255	0.984
$HHBEHINT_i$	-0.025	11.66	0.0006	0.975
$HHCOMINT_i$	0.002	0.06	0.8033	1.002
$LNADCR_i$	0.769	477.45	0.0001	2.158
$URATTINT_i$	0.039	2.38	0.1227	1.040
$URBEHINT_i$	-0.066	6.76	0.0093	0.936
$URCOMINT_i$	-0.144	23.18	0.0001	0.866
$NETPRICE_{i,t}$	0.134	10.57	0.0011	1.144

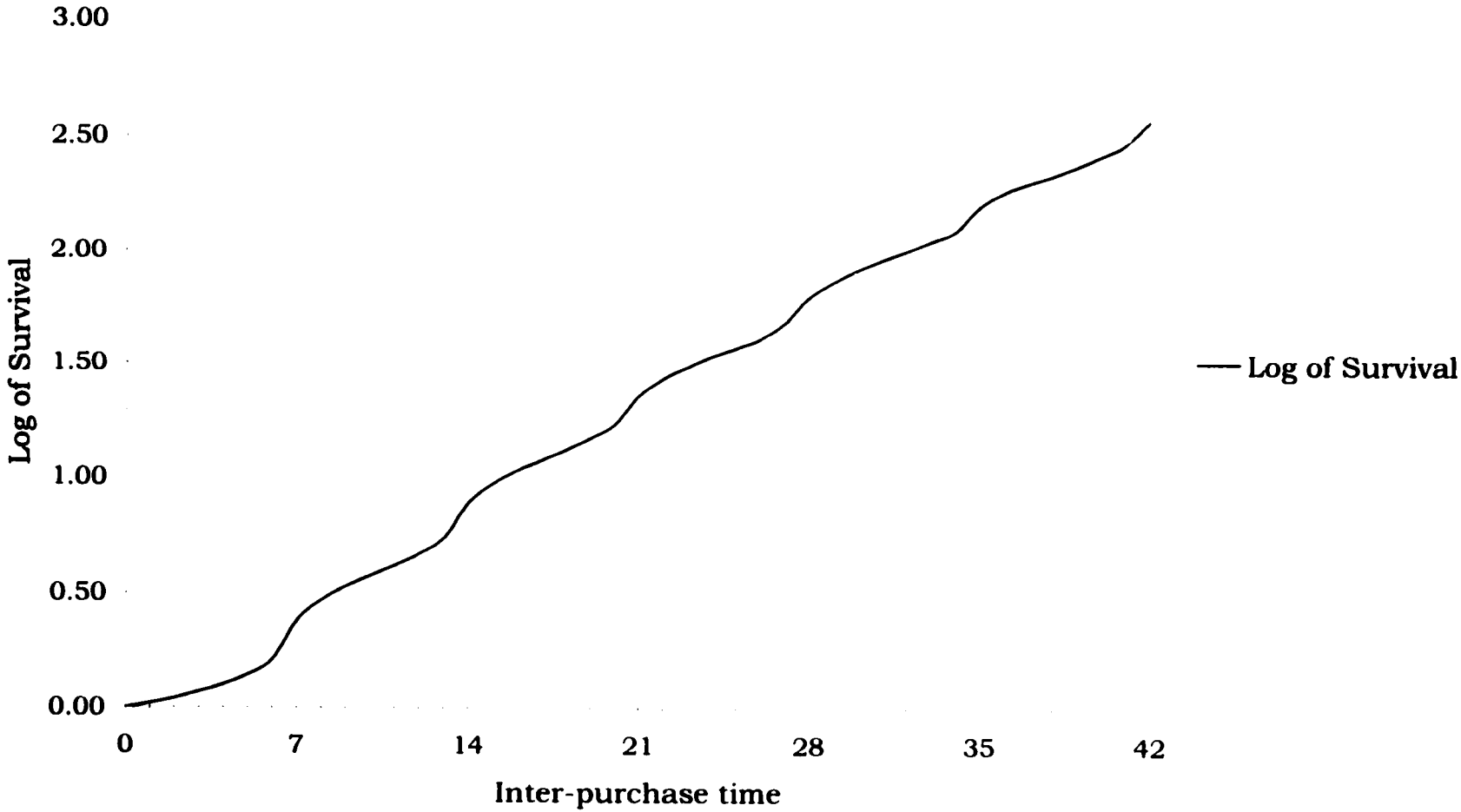
Notes:
1. Model without covariates: -2 log likelihood = 259,945.371.
2. Model with covariates: -2 log likelihood = 256,467.690.
3. Model χ^2 = 3,477.681, $d.f.$ = 23, $p < 0.0001$.
4. Model based on 16,272 observations of which 1,854 are censored.

Table 17
Purchase Timing Model: Cox's proportional hazard model
(Revised model)

Variable	Parameter Estimate	Wald χ^2	p value for Wald χ^2	Risk Ratio
$LNMIPT_i$	-0.681	573.47	0.0001	0.506
$PRICECHG_{i,t}$	-0.078	6.53	0.0106	0.925
$CPNUSED_{i,t}$	-0.005	0.04	0.8333	0.995
CAL^*_i	0.001	0.00	0.9480	1.001
CBL_i	-0.051	29.80	0.0001	0.951
CCL_i	-0.060	32.79	0.0001	0.942
$PCALOYAL_{i,t}$	0.014	0.37	0.5439	1.014
$PCBLOYAL_{i,t}$	-0.019	0.61	0.4345	0.981
$PCCLOYAL_{i,t}$	0.037	2.43	0.1189	1.038
$CPALOYAL_{i,t}$	0.005	0.06	0.8049	1.005
$CPBLOYAL_{i,t}$	-0.019	0.82	0.3652	0.981
$CPCLOYAL_{i,t}$	-0.030	2.43	0.1190	0.971
$LNPQ_{i,t-1}$	-0.350	264.38	0.0001	0.705
$LNINV_{i,t}$	0.413	288.87	0.0001	1.511
$NUMHH_i$	0.011	2.63	0.1049	1.011
$HHATTINT_i$	-0.016	5.26	0.0218	0.984
$HHBEHINT_i$	-0.019	6.62	0.0101	0.981
$HHCOMINT_i$	-0.002	0.04	0.8405	0.998
$LNADCR_i$	0.108	5.14	0.0233	1.114
$URATTINT_i$	0.025	0.98	0.3206	1.025
$URBEHINT_i$	-0.089	12.56	0.0004	0.915
$URCOMINT_i$	-0.112	14.18	0.0002	0.894
$NETPRICE_{i,t}$	0.079	3.65	0.0561	1.083

Notes:
1. Model without covariates: -2 log likelihood = 259,945.371.
2. Model with covariates: -2 log likelihood = 256,053.677.
3. Model χ^2 = 3,891.694, *d.f.* = 23, $p < 0.0001$.
4. Model based on 16,272 observations of which 1,854 are censored.

Figure 9
Baseline Hazard function from purchase timing model



Consumption Rate Model

As we have noted, consumption rate behavior is an aspect of consumer behavior that is of significance to managers. However, it is only recently that consumption rate has been modeled in the marketing literature. The results of our consumption rate model are presented in Table 18. Our model has an $R^2_{adj.}$ of 0.18. Diagnostic checks of the residuals and variance inflation factors suggested that the assumptions of the model were reasonably satisfied. We use Chandon and Wansink's (1996) consumption index measure, CI_t^h, as our dependent variable. Chandon and Wansink obtain R^2s of 0.08, 0.10, and 0.02 for their consumption models of fruit juice, cookies, and laundry detergent, respectively. Using a R^2 criterion our model compares favorably to those of Chandon and Wansink.

The coefficient for the interaction of price and behavioral loyalty, $PRBLOYAL_{t-1}^h$, is positive and significant indicating that behavioral loyals are less price sensitive than non-loyals in their consumption rate behavior. The coefficient for price's interaction with attitudinal loyalty, $PRALOYAL_{t-1}^h$, is positive but statistically non-significant. A joint F-test indicates no difference in the coefficients $PRALOYAL_{t-1}^h$ and $PRBLOYAL_{t-1}^h$ ($F_{1,\ 16258} = 2.11$; $p = 0.15$). This suggests that there is no difference in price sensitivity between attitudinal and behavioral loyals; H9 is not supported. The coefficient for price and its interaction with

true loyalty, $PRCLOYAL^h_{t-1}$, is negative and statistically significant (p = 0.01) suggesting that the interaction of the dimensions of loyalty partially negates the "main effects" of the dimensions of loyalty on price sensitivity.

The coefficients representing attitudinal and behavioral loyalty's interaction with coupons are non-significant, indicating no difference in the coupon sensitivity between loyals and non-loyals. We also find no significant difference between attitudinal and behavioral loyals in their coupon sensitivity with respect to consumption rate behavior ($F_{1, 16258}$ = 2.58; p = 0.11). There is no support for H10. The coefficient for the interaction of true loyalty and coupon use, $CPCLOYAL^h_{t-1}$, is negative and significant suggesting that true loyalty reduces coupon sensitivity.

We note that nine of the thirteen coefficients in the consumption rate model (not counting the intercept) are significant. However, none of our hypotheses were supported. The absence of more definitive results may be related to the fact that household consumption is not directly observed but must be estimated based on shoppers' purchase quantity and purchase timing behavior. It is very clear in the literature, and the finding of this study is in keeping with the literature, that marketing variables or household characteristics do not capture much of the variation in purchase timing. Further work in this area may be able to produce more fruitful results.

Table 18
Regression model of Consumption Rate

Variable	Parameter Estimate	Standard Error	*t* value	*p* value for |*t*|
Intercept	-1.656	0.359	-46.132	0.0001
$NETPRICE^{h}_{t-1}$	-0.048	0.024	-2.005	0.0450
$CPNUSED^{h}_{t-1}$	-0.018	0.016	-1.108	0.2679
CAL^{*h}	0.011	0.006	1.842	0.0656
CBL^{h}	0.043	0.006	7.690	0.0001
CCL^{h}	-0.016	0.006	-2.621	0.0088
$PRALOYAL^{h}_{t-1}$	0.020	0.020	0.986	0.3240
$PRBLOYAL^{h}_{t-1}$	0.063	0.022	2.802	0.0051
$PRCLOYAL^{h}_{t-1}$	-0.047	0.019	-2.468	0.0136
$CPALOYAL^{h}_{t-1}$	0.025	0.015	1.604	0.1087
$CPBLOYAL^{h}_{t-1}$	-0.011	0.016	-0.660	0.5096
$CPCLOYAL^{h}_{t-1}$	-0.064	0.015	-4.169	0.0001
$LNPQ^{h}_{t-1}$	-0.197	0.014	-13.682	0.0001
$LNINV^{h}_{t}$	0.711	0.015	47.751	0.0001

Notes:

1. Dependent variable = CI^{h}_{t} = Consumption index for household *h* for consumption period *t* that begins at *t*-1 and ends at *t*.
2. $R^2 = 0.1796$, $R^2_{adj.} = 0.1789$, $F_{13,\ 16258} = 273.733$, $p < 0.0001$.

Relation of consumption rate model findings to research objectives

Our principal research objectives were to understand the brand behaviors of different segments of loyals and to determine differences in sensitivity to marketing actions of these different segments. Here we point out these differences with respect to consumption rate behavior.

The results of our consumption rate model indicated that there were significant differences in price sensitivity between loyals and non-loyals. Figure 10 shows that the effect of price on the estimated rate of consumption is not monotonic and is vastly different for behavioral loyals

(spurious and true loyals) and non-behavioral loyals (non-loyals and latents). This is the same dichotomy we observed with regard to brand choice. Figure 10 indicates that behavioral loyals consume lower price salty snacks at a faster rate than higher priced snacks. The reverse is true for non-behavioral loyals, ceteris paribus.

Non-behavioral loyals (latents in particular) purchase a large variety of brands, including brands toward which they are not distinctly attitudinally loyal. They buy more of the store brand than behavioral loyals. Even though they may not be attitudinally loyal to the store brand they consume a relatively high amount of store brand product. The results suggest that when they do purchase higher-priced/higher-quality brands (the brands they favor) they consume these brands at a relatively fast rate. This is consistent with the results given by the purchase timing model, which suggested that the duration time for higher-priced/higher-quality brands is shorter than that for lower-priced/lower-quality brands. Clearly, the shorter the duration time (i.e., the time between purchases), the higher the consumption rate, ceteris paribus.

The results from the consumption rate model ties together the results from the brand choice, purchase quantity, and purchase timing models. Consumption rate considers the amount consumed (somewhat analogous to purchase quantity) per unit time. The results depicted in Figure 10 shows that different segments consume at different rates. The

results also suggest that different segments, which choose to consume different brands, consume different brands at different rates.

Figure 11 shows changes in estimated consumption rate for different households with increasing attitudinal loyalty. Spurious loyals consume at the fastest rate. Based on what is observed in Figure 10, there would be no incentive for managers to seek to reposition these shoppers. Figure 10 suggests that increasing the attitudinal loyalty of non-loyals would result in faster consumption. The acceleration may be expected to be most profound if there is a simultaneous increase in behavioral loyalty. Figure 12 shows changes in estimated consumption rate for different households with increasing behavioral loyalty. Figure 12 suggests that any increase in behavioral loyalty would bring about an increase in consumption rate. This finding is wholly consistent with what we found with respect to purchase quantity. Increasing behavioral loyalty increases both purchase quantity and consumption rate.

Figure 10
Consumption rate as a function of price

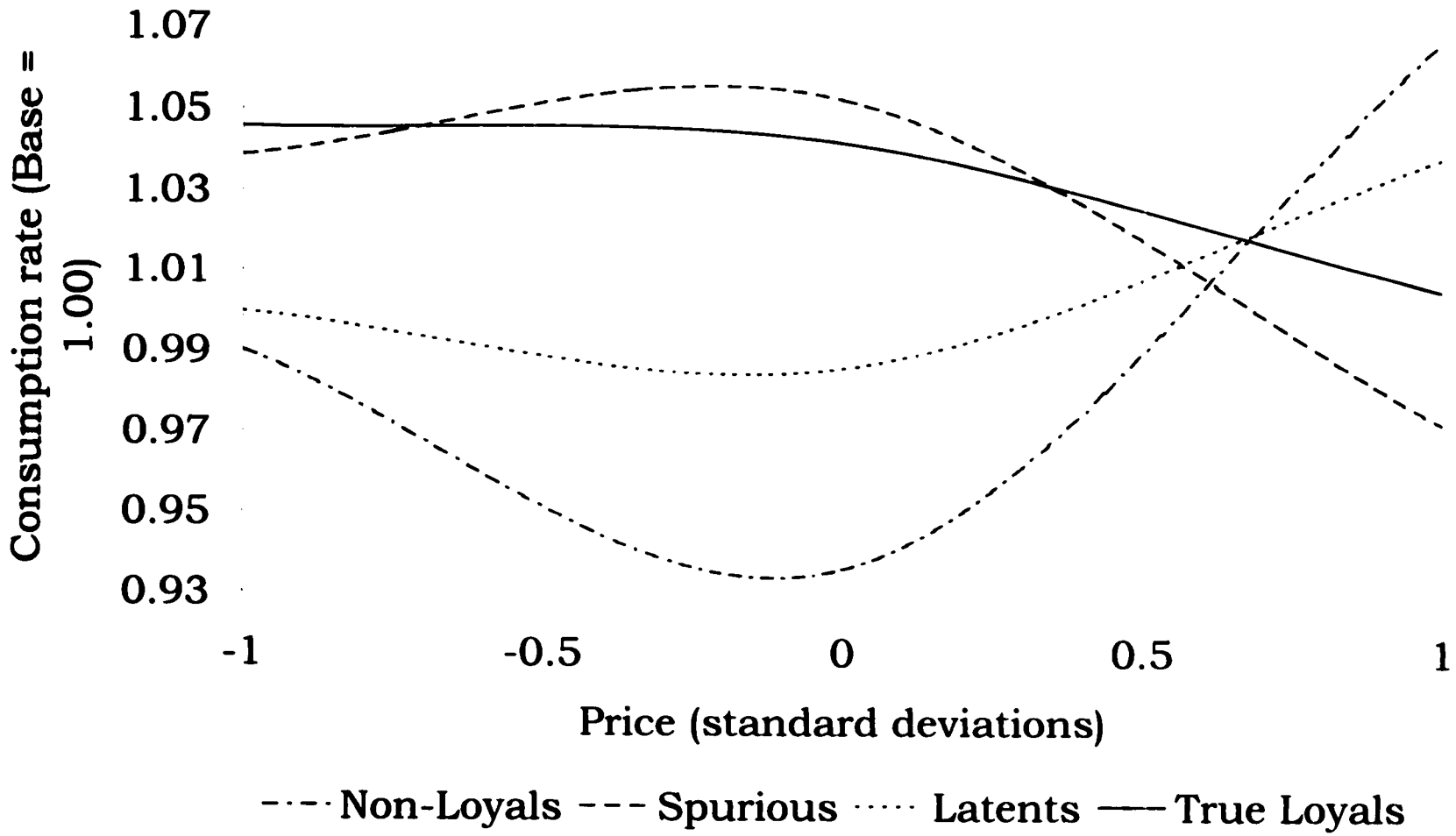


Figure 11
Consumption rate as a function of attitudinal loyalty

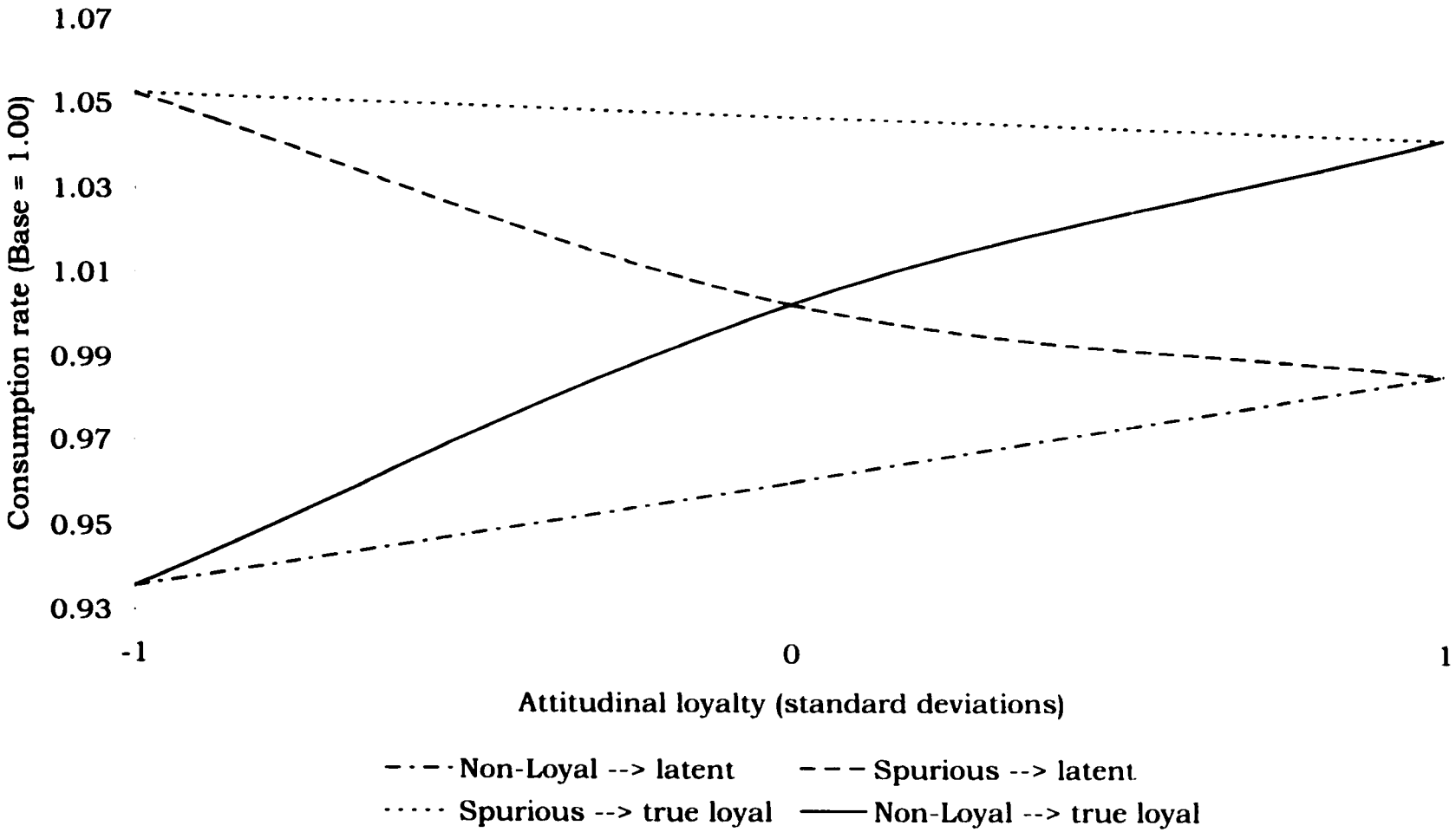
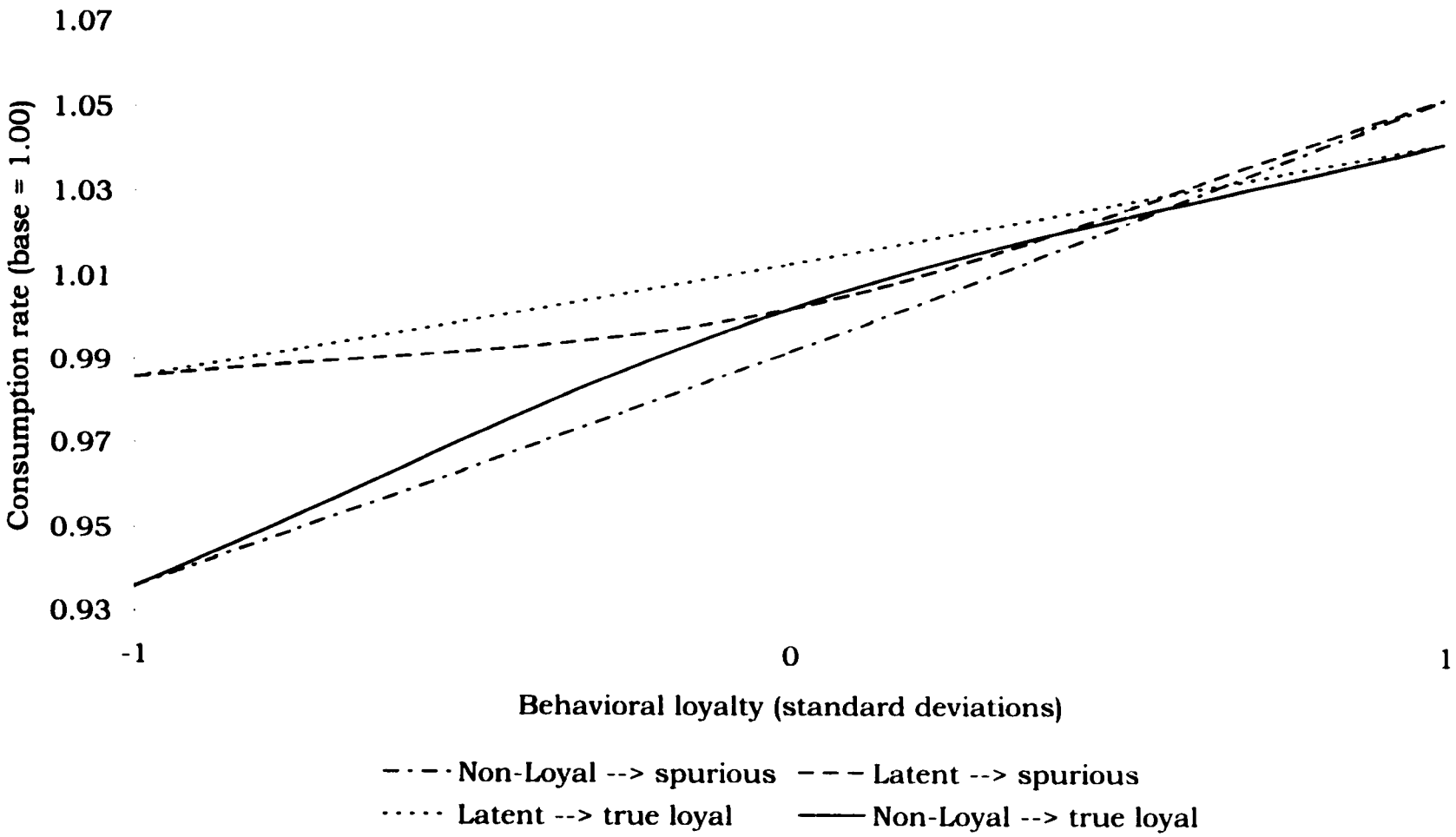


Figure 12
Consumption rate as a function of behavioral loyalty



Summary

In this chapter we presented our brand behavior models and the results of our hypothesis testing. Our choice and purchase quantity hypotheses were supported; our purchase timing and consumption rate hypotheses were not supported. Attitudinal loyals were found to be more price sensitive than behavioral loyals, but behavioral loyals are more coupon sensitive than attitudinal loyals. Table 19 provides a summary of our hypotheses testing. In the next chapter we discuss the implications of our results and the study's limitations and contributions.

Table 19
Summary of the Results of Hypotheses Testing

Hypothesis	*Supported?*	*Interpretation*
Choice		
H1	Yes	Shoppers are less price sensitive to the brands to which they are attitudinally loyal
H2	Yes	Shoppers are less price sensitive to the brands to which they are behaviorally loyal
H3	Yes	Shoppers are least price sensitive to the brands to which they are truly loyal
H4	Yes	Latent loyals are more price sensitive than spurious loyals. Where attitudinal loyalty is dominant shoppers are likely to be relatively price sensitive.
Purchase quantity		
H5	Yes	Attitudinal loyals are in the main more price sensitive than behavioral loyals
H6	Yes	Behavioral loyals are in the main more coupon sensitive than behavioral loyals
Purchase timing		
H7	No	Attitudinal and behavioral loyals are in the main equally price sensitive
H8	No	Attitudinal and behavioral loyals are in the main equally coupon sensitive
Consumption rate		
H9	No	Attitudinal and behavioral loyals are in the main equally price sensitive
H10	No	Attitudinal and behavioral loyals are in the main equally coupon sensitive

CHAPTER 7

DISCUSSION: IMPLICATIONS, LIMITATIONS AND CONTRIBUTIONS

In this chapter we discuss our findings and their implications and point to the limitations of our study. We also highlight the contributions of our study. We draw the conclusion that the objectives of this research have been achieved.

Discussion of findings and their implications

Brand choice

We were able to establish support for our hypotheses with respect to the relationship between the dimensions of brand loyalty and brand choice behavior. We find that shoppers were less price sensitive to the brand to which they were attitudinally and behaviorally loyal. Most significantly, we found that shoppers were least price sensitive in the brand choice decision to the brand to which they were truly loyal, this is the brand to which they were both attitudinally and behaviorally loyal. This finding clearly indicates that there is benefit to measuring and understanding loyalty with respect to both attitude and behavior. Both dimensions are important and it does make a difference if only one dimension is measured. We find that there is a unique effect of each of the dimensions of brand loyalty and we also find that there is a unique effect as a result of the interaction of the dimensions of brand loyalty on choice behavior.

Furthermore we found latent loyals to be the most price sensitive segment in the brand choice decision and spurious loyals to be the least price sensitive. Latent shoppers are those with relatively high attitudinal loyalty but relatively low behavioral loyalty. Although on one hand they view only a few brands as being favorable, on the other hand their purchase behavior includes the purchasing of many brands. There is a mismatch between their attitude and behavior. The high degree of price sensitivity of latents suggests that whereas they may only view a small proportion of brands favorably, they are very willing to purchase brands that are offered on deal, including brands toward which they may not be particularly favorably disposed. For these customers having a favorable brand attitude is not sufficient to result in a purchase.

Price is extremely important to latent shoppers. Latents may be rightfully labeled as "prospects" (Baldinger and Rubinson 1996). Offering coupons (or other opportunities for price reductions) to latents is quite likely to convert these "prospects" into true loyals so that their purchase behavior is consistent with their attitudinal loyalties.

Spurious shoppers are the least price sensitive. The absence of price sensitivity suggests that these shoppers may be suffering from inertia. That is, these shoppers purchase the same brands repeatedly, attitudinal loyalties notwithstanding. These shoppers are in the habit of buying the same brands over and over and over again. The same brands are purchased whether or not they are on- or off-deal.

The attitudinal loyalty of spurious shoppers is diluted in that they view many brands favorably. The attitudinal loyalty of spurious shoppers is spread across many brands as opposed to latent loyals whose attitudinal loyalty is concentrated in only a few brands. Even though spurious loyals view many brands favorably they have developed the habit, perhaps out of convenience, of purchasing only a subset of the brands toward which they have a favorable attitude. For these shoppers to become true loyals requires a change in attitudes. Price promotions are not likely to change brand attitudes. Attitudes are neither momentary nor transitory but represent the subject's consistent evaluation of the attitudinal object (Sherif, Sherif, and Nebergall 1965). Guest (1964) found that brand attitudes could be very enduring, not changing after 20 years in the case of some subjects.

Converting spurious loyals into true loyals is a difficult proposition. Changing attitudinal loyalties is a difficult proposition. Brand managers for the brands toward which spurious loyals are behaviorally loyal would be satisfied with the status quo. The fact that these customers may have favorable attitudes toward competing brands is not particularly troubling to these brand managers. After all, the reality is that the shopper is not purchasing the competing brands.

A brand manager of a brand toward which the spurious loyal is favorably disposed attitudinally but does not purchase is faced with a great challenge. One strategy to overcoming this dilemma is to engage in

comparative advertising, which shows the competing brand (which is currently purchased by the spurious loyal) in a credible but unmistakably negative light. If this causes a deterioration in the shopper's attitude toward the competing brand (without a similar adverse effect on the brand toward which little behavioral loyalty is currently shown) then a conversion from spurious loyal to true loyal may take place. Suffice it to say that such a conversion may be very difficult.

We observe with interest that the price sensitivity of true loyals (price coefficient = -13.6) and non-loyals (price coefficient = -13.7) is remarkably close and lies between that of latent and spurious loyals (price coefficients = -14.5 and -12.9 respectively). In the case of true loyals and non-loyals both dimensions of brand loyalty are consistent with each other. In the case of latent and spurious loyals there is a mismatch between attitudinal and behavioral loyalty. For latent loyals attitudinal loyalty is the dominant dimension of brand loyalty. For spurious loyals behavioral loyalty is the dominant dimension of brand loyalty. Attitudinal loyalty is a function of cognitive processing. Attitudinally loyal shoppers are motivated to make careful discrimination among prices. Hence when attitudinal loyalty is dominant the shopper is relatively price sensitive. On the other hand when behavioral loyalty is dominant the effect of inertia is very telling which manifests itself in diminished price sensitivity. When neither of the dimensions of brand loyalty are dominant the shopper is moderately price sensitive.

Purchase quantity

The results of our analysis are supportive of our hypotheses that behavioral loyals are less price-sensitive but more coupon-sensitive in their purchase quantity decisions. These findings suggest that it may be more important to cultivate behavioral loyalty as opposed to attitudinal loyalty. An increase in attitudinal loyalty of one percent is associated with an increase in purchase quantity of approximately one percent, ceteris paribus. This is compared to an increase in behavioral loyalty of one percent that is associated with an increase in purchase quantity of approximately three percent, ceteris paribus. This of course in no way implies that attitudinal loyalty is unimportant, for indeed it very much is! One of the benefits of brand loyalty is diminished price sensitivity. We find that attitudinal and behavioral loyals are less price-sensitive than non-loyals in the purchase quantity decision and behavioral loyals are significantly less price-sensitive than attitudinal loyals. The "main effect" of attitudinal and behavioral loyalty coefficients indicate that attitudinal and behavioral loyals have higher purchase quantities than non-loyals. In addition we find that behavioral loyals have significantly higher purchase quantities than attitudinal loyals, ceteris paribus ($F_{1, 17424} = 11.05$, $p < 0.001$). That is, not only do behavioral loyals purchase more but also they are less price sensitive.

Purchase timing

Our purchase timing model was statistically significant but like several models in the literature our purchase timing model accounts for only a small amount of the variance in purchase timing. We did not find support for our hypotheses. What we do find is that average interpurchase time, amount of inventory, and prior purchase quantity are the most significant predictors of purchase timing.

A price reduction was found to shorten duration times. This finding is consistent with other purchase timing studies (e.g., Helsen and Schmittlein 1993; Vilcassim and Jain 1991). Coupons were not found to significantly affect purchase timing in this study. In their study Jain and Vilcassim (1991) found coupons to affect purchase timing.[36] Attitudinal loyalty was not a significant predictor in our purchase-timing model but behavioral loyalty and true loyalty (the interaction of attitudinal and behavioral loyalty) were. Behavioral loyals (i.e., households that limited their salty snack purchases to only a few brands) and true loyals (i.e., households that regarded only a small proportion of brands favorably and limited their purchases to only a few brands) had longer duration times between purchases. None of the variables representing the interaction of the dimensions of loyalty and marketing actions were significant.

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[36] We note that other purchase timing studies (e.g., Gupta (1988), Helsen and Schmittlein (1993) and Vilcassim and Jain (1991)) did not include coupons in their purchase timing models.

Consumption rate

We found that consumption accelerates in the presence of greater inventory but decelerates when a large quantity is purchased. This suggests two opposing forces at work with respect to changes in consumption rate. The finding of consumption acceleration in the presence of greater household inventory is consistent with the findings of Chandon and Wansink (1996) and Ailawadi and Neslin (1998). However, the finding that there is a deceleration in consumption rate when there is a large purchase may suggest that household members quickly consume small purchases out of fear that in a little while other household members will consume the household's entire stock of salty snacks. When the purchase quantity is large this fear is mitigated.

A price reduction was found to accelerate consumption rate. The "main effect" of coupon use on consumption rate was not significant. The "main effect" of attitudinal, behavioral, and true loyalty were all found to be significant suggesting that loyals consume faster than non-loyals and that different types of loyals consume at different rates. Behavioral loyals were found to consume at a faster rate than attitudinal loyals ($F_{1, 16258} = 17.31$, $p < 0.001$). The interaction of attitudinal and behavioral loyalty was found to attenuate the effect of the dimensions of loyalty on consumption rate as reflected in the coefficient for true loyalty that is negative and significant.

Although we failed to find significant differences between attitudinal and behavioral loyals with respect to their price sensitivity in consumption rate behavior, we do find that the interaction of attitudinal and behavioral loyalty attenuates (i.e., mitigates) the "main effect" of behavioral loyalty on reducing price sensitivity. We find no significant difference in the coupon sensitivity of attitudinal and behavioral loyals with respect to consumption rate behavior. The coefficient representing the interaction of true loyalty and coupon use was the only coefficient involving coupon use that was significant. The finding suggests that when true loyals use coupons they consume at a relatively slow rate.

The findings of our consumption rate model imply that pricing can be used to alter the consumption rate of different segments of consumers. However, coupons have limited use in changing household consumption rates. Promotional pricing that incites stockpiling can prove to be very fruitful in increasing consumption given our finding that consumption increases in the presence of higher inventory.

Limitations and Future Research

Our study has limitations that inherently circumscribe the extent to which our findings may be generalized. This study was conducted in the salty snacks product category. Our findings and their implications may be more generalizable if this study may be conducted with respect to other product categories. Much research has looked at loyalty with respect to consumer goods. Loyalty research with respect to durable

goods is not as abundant. Examination of the relationship between the dimensions of brand loyalty and marketing actions as it relates to other product categories and other types of products, including services and durable goods, are inviting avenues for future research. Research along this line may also be extended to examine the relationship between the dimensions of store (or retail format) loyalty and their shopping behaviors.

In their study that examined loyalty in the automobile market McCarthy, Kannan, Chandrasekharan, and Wright (1992) looked at behaviors in submarkets. One possible avenue of future research is to examine the extent to which the dimensions of loyalty affect sensitivity to marketing actions in various submarkets. Many product categories are characterized by distinct submarkets (e.g., the powder and liquid submarkets in the laundry detergent product category). Examining loyalty not just at the product category level but at the submarket level may provide a more comprehensive understanding of the dynamics of brand loyalty.

Another limitation of our study is that the purchase behavior related to the household but the survey portion of our data was gathered from a member of the household. The individual who completed the salty snack survey may not be the same individual who made (or was substantially responsible) for the salty snack purchases. We sought to reduce the possibility of this occurrence by asking that "the primary

grocery shopper who buys salty snacks in your family" complete the survey.

We do not have data on all salty snack purchases made by the households. We only have data on the purchases made by the shoppers at the retail chain that participated in the study. This is another limitation of our study. In the survey we asked the respondent to identify the store from which they purchased salty snacks most often. We found that approximately 85% of survey respondents identified the sponsoring retail chain as the store from which they purchased salty snacks most often.

Price changes and couponing activity are not the only marketing actions that influence purchase and consumption behavior. Other marketing actions such as features and displays are sure to influence the purchase behavior for salty snacks. We did not have data on features and displays. The veracity of our findings is limited to the extent that the impact of these marketing actions on purchase behavior has not been accounted for. The availability of feature and display data in future studies would provide greater insight into how different loyalty segments respond to marketing actions in their brand behaviors.

Another issue that may be considered a limitation of the study is the reliability of data used in the study. This study uses both survey and scanner data. As cogently pointed out by Dillon and Gupta (1996), both surveys and scanner data have their advantages and disadvantages.

Both sources of data have limitations and the data contained therein cannot be represented to be devoid of unreliability. The reliability of pricing information in scanner systems in some instances has been found to be suspect (Goodstein 1994). Furthermore, even if the "objective pricing information" contained in the scanner data were correct, from a consumer behavior perspective it is perceived price (which is inherently subjective) that affects purchase behavior (Dillon and Gupta 1996; Monroe 1973; Ziethmal 1988).

The only data used in our models that was extracted from the survey was attitudinal loyalty. Twenty-eight items were used to measure attitudinal loyalty.[37] The use of multiple items is a standard technique to ensure the reliability of survey measures (Sudman and Bradburn 1982). In sum, we are satisfied with the reliability of the data used in the study and the results that were obtained. This assessment is based upon consideration of the nature of the data used in other purchase behavior studies and with appreciation of the benefits and limitations of scanner and survey data.

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[37] Our global measure of attitudinal brand loyalty is a single measure derived from 28 items based on the proportion of brand items viewed favorably, unfavorably, or indifferently by the respondent. It is not a summated scale. In light of this it is meaningless to report a reliability measure such as Cronbach α. A factor analysis of the 28 brand items suggests eight brand item groupings. A reliability analysis of these eight groups was conducted by summing up the items in each group. The Cronbach αs for six of these eight groups were good ranging from 0.68 to 0.82. The remaining two groups were two-item groups with sub par Cronbach αs of 0.59 and 0.52.

Contributions and Conclusion

Our study makes a contribution to the literature by showing how consumers, segmented on the basis of the attitudinal and behavioral dimensions of loyalty, differ in terms of their brand behaviors (including consumption rate) and their sensitivity to marketing actions. To our knowledge, this is the first study that has been able to accomplish this. We find that both dimensions have an independent effect and unique impact on brand behaviors. An increase in one dimension of brand loyalty is not equivalent to an equal change in the other dimension of brand loyalty in terms of a) impact on brand behaviors and b) changes in sensitivity to marketing actions.

The correlation between attitudinal loyalty and behavioral loyalty is virtually zero (-0.011, $p = 0.15$) suggesting no linear relationship between the dimensions of loyalty. We do find that an increase in behavioral loyalty has a higher "pay off" in terms of producing desirable brand behaviors. More importantly however, we find that a simultaneous increase in both dimensions greatly magnifies the effect of loyalty on brand behavior. With respect to sensitivity to marketing actions we find that the interaction of both dimensions attenuates sensitivity to marketing actions. These findings clearly advance our understanding of the relationship between the dimensions of loyalty and their relationship to marketing actions and brand behaviors.

The absence of a correlation between attitudinal and behavioral loyalty indicates that it is important that both dimensions of loyalty be measured. The absence of a significant correlation between the dimensions of loyalty suggests that a measurement of one dimension cannot be used as a proxy measure of the other dimension. It does make a difference how brand loyalty is measured and it does make a difference which dimensions are measured. When both dimensions are measured we are able to distill the impact of both dimensions of brand loyalty and avoid a co-mingling of loyalty segments. For instance, if we only measure loyalty in attitudinal terms there would be a co-mingling of latent loyals and true loyals as high-loyals and a co-mingling of non-loyals and spurious loyals as low-loyals. Likewise, if loyalty were measured only in behavioral terms there would be a co-mingling of spurious and true loyals as high-loyals and non-loyals and latent loyals as low-loyals. By measuring loyalty in both attitudinal and behavioral terms we are able to more correctly appropriate the effect of loyalty with respect to brand behaviors. This we believe to be a critical contribution to the literature.

Our study also makes a contribution by shedding some light on consumption rate behavior. Research on consumption rate behavior is very much in a state of infancy and our findings here should be measured against future work in this area. Our findings here are preliminary findings in this area of investigation. The results from this study are consistent with the work of Chandon and Wasnick (1996)

showing that consumption increases in the presence of inventory. We also find that the correlation between purchase quantity and consumption rate is virtually zero (r = -0.010). This indicates that there is no linear relationship between quantity purchase and consumption rate. The size of one's purchase does little to tell us the rate at which consumption takes place. This result suggests that purchase quantity and consumption rate need to be studied as separate behaviors.

Our study very much has relevance to marketing theory. The marketing concept and the business philosophy of a market orientation draw attention to the fact that the satisfaction of customer needs should be the paramount concern of the organization. The ultimate objective of the business organization is to realize profitable relationships with its customers. Such profitable relationships can only be sustained if some form of customer loyalty (e.g., brand loyalty) has been developed. A necessary condition for loyalty is satisfaction which is the outgrowth of the perception that the customer is experiencing superior value (Churchill and Peter 1998). These relationships are shown in Figure 13.

The results of this study show that brand loyal shoppers are less price sensitive in their choice decisions, purchase larger quantities, and consume at a faster rate. These types of behaviors are suggestive of shoppers who are likely to be more profitable. Hence, the findings of this study is supportive of a basic tenet of marketing theory that the

provision of superior value will in turn create customer satisfaction and loyalty which will produce the desired outcome of profitability.

Reichheld (1993) and his colleagues (Reichheld and Sasser 1990; Reichheld with Teal 1996) have been very adamant in their arguments that the way to sustained profitability for service companies lies not in customer satisfaction but in maintaining and increasing customer retention rates (i.e. loyalty). Reichheld and colleagues have shown that even marginal improvement in customer retention rates results in multiplied gains in profitability.

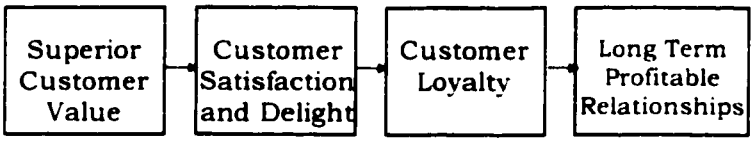
It is not difficult to accept the idea that in high involvement services that changes in customer retention rates is directly related to profitability. After all, by their very nature high involvement services are characterized by personal relationships between the customer or client and the service provider. A deepening of the relationship between the service provider and the customer can be reasonably expected to prove profitable for both parties.

Consumer packaged goods seldom entail high involvement purchasing. The involvement between the consumer and the brand manufacturer is slight. The results of this study however indicate that even a small change in brand loyalty is a major boon to the brand manufacturer. Our results suggest that the domain of marketing theory with respect to the effects and benefits of loyalty extends not just to high involvement services but encompasses low involvement consumer goods

as well. The critical need for service firms to cultivate customer loyalty has been well developed theoretically and has received convincing empirical support (Reichheld 1993; Reichheld and Sasser 1990; Reichheld with Teal 1996). This dissertation strongly suggests that marketing theory with respect to loyalty and its implications for marketers is equally valid for service providers and the manufacturers of consumer packaged goods.

Figure 13

The Antecedents and Consequences of Loyalty



Source: Churchill and Peter (1998)

The managerial contributions of this study stems directly from the implications of our findings. This study directs managers to the types of marketing actions most appropriate for different loyalty segments. The most price sensitive segment consists of latents. Hence, price reductions would be most effective with these types of loyals in evoking desired behaviors. On the other hand, the most coupon sensitive segment are spurious loyals. Coupons should be specifically directed to these

shoppers. Our findings strongly suggest that it would be most profitable to design different marketing actions for different loyalty segments.

We also make a managerial contribution by showing the relationship between the dimensions of loyalty and consumption rate. Increasing consumption among current users is the most viable option now available to many managers for growing their brands. Marketing actions can be used to accelerate consumption. Our findings indicate that higher-price/higher-quality brands are consumed at a faster rate than lower-price/lower-quality brands. This suggests that managers seeking to grow their brands must pay attention to product quality.

Our study is useful in that it expands our understanding of brand loyalty and its impact on consumer behavior and how brand loyalty moderates the impact of marketing actions on consumer behavior. It is also useful in that it provides managerial direction as to how loyalty may be cultivated and how marketing actions directed to select groups of consumers may bring about the most desired results.

APPENDIX A

INSTITUTIONAL REVIEW EXEMPTION CERTIFICATE

IRB No. 00597

UNIVERSITY OF MARYLAND
College Park, MD 20742

INSTITUTIONAL REVIEW BOARD
Exemption Certificate

May 8, 1998

PRINCIPAL INVESTIGATOR: Dr. Richard Durand
(or Faculty Advisor) College of Business and Management

STUDENT INVESTIGATOR: DAVID DORSETT

PROJECT TITLE: Understanding Multiples-Buying Behavior in Salty Snacks

The Co-Chairpersons of the University IRB reviewed the above-mentioned project on May 7, 1998, in accordance with Public Health Service grant policy as defined in "The Institutional Guide to DHHS Policy on Protection of Human Subjects," 12-2-71, and in Title 45, Code of Federal Regulations, Part 46, and found this project to be exempt.

Exemption No. 2

Denise C. Gottfredson, IRB Co-Chair

Robert J. Dooling, IRB Co-Chair

The Principal Investigator and Student Investigator, in signing this report, agree to notify the Office of the Dean for Graduate Studies and Research of any addition to or changes in procedure subsequent to this review.

Principal Investigator
(or Faculty Advisor)

Student Investigator
(if applicable)

THE APPROVAL FOR THIS PROJECT EXPIRES May 31, 2001.

PLEASE RETURN ONE SIGNED COPY TO THE IRB OFFICE, ROOM 2133, LEE BUILDING

IRB-4; 11/97

APPENDIX B

SALTY SNACK SURVEY

UNIVERSITY OF MARYLAND AT COLLEGE PARK
COLLEGE OF BUSINESS AND MANAGEMENT

Dear Shopper:

The University of Maryland is conducting consumer research on shopping behavior and attitudes. Your household has been selected to participate in the study. We would like to have the primary grocery shopper who buys salty snacks in your family to complete the questionnaire.

Our pre-tests indicate that the questionnaire takes on average 25-30 minutes to complete. Of course, you may take more or less time. This questionnaire is easy to complete as there are no right or wrong answers and the topic area is one that is interesting to most shoppers.

As a token of our appreciation for completing the survey, we will send you a $10.00 grocery gift certificate good at a local store in your area. In order to receive the gift certificate, please mail the completed questionnaire to us by June 15, 1998. Once you have completed it, please send it back to us in the enclosed postage paid envelope. When we receive your questionnaire we will use the mailing label on the front cover of this booklet to send you your $10.00 certificate.

Thank you very much for participating in this survey! Your answers are important to us, and we urge you to complete the survey carefully. If you have any questions concerning this survey, please contact me at 301/405-2198.

Sincerely,

Richard M. Durand

Richard M. Durand, Ph.D.
Professor and Chair of Marketing

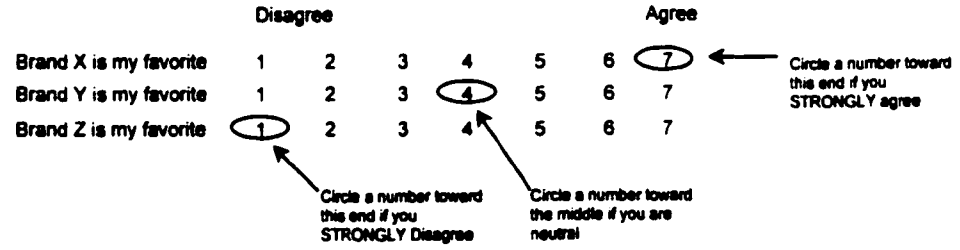
ABOUT THIS SURVEY

Answering Questions

The questionnaire has been carefully designed to make it easy to answer. To answer questions, you simply circle the number that best reflects your personal opinion. You can circle any number you wish.

Examples

To indicate your opinion of a product you are aware of, you might do any of the following:



Some Hints

- If you do not know which number to circle, **please do not leave the question blank.** Instead, put the circle in the center of the line, as in the second example above.
- Please answer **all** questions to the best of your ability.
- We suggest you use a pencil. That way, if you change your mind you can easily erase the old answer.
- Remember: there are no right or wrong answers -- **only your personal opinion matters to us!**

QUESTIONS ABOUT WHERE YOU SHOP

1. During the past four weeks, which one supermarket have you shopped at **most often**? (Please circle the number that corresponds to ONE store under Column #1.)
2. During the past four weeks, at which other stores have you shopped? (Circle all that apply under Column #2.)

Supermarkets	MOST OFTEN COLUMN #1	OTHERS I SHOP COLUMN #2
[redacted]		
Jubilee Foods	2	2
[redacted]		
Price Chopper	4	4
[redacted]		
Shur - Fine	6	6
[redacted]		
Weomens	8	8
[redacted]		

3. And at which of these types of stores below have you shopped for groceries in the past four weeks? (Circle all that apply.)

Discount store, like Target or Wal-Mart	1
Club store/warehouse club like Sam's or B.J.s	2
Drug store	3
Convenience store	4
None	5

QUESTIONS ABOUT YOUR GENERAL SHOPPING ATTITUDES

4. Following are some questions about your **general shopping attitudes**. Please circle the number which best describes how much you agree or disagree with each statement.

	Disagree									Agree
[redacted]										
b. I always buy my favorite brands, whether they are on sale or not	1	2	3	4	5	6	7	8	9	10
[redacted]										
d. When shopping, I have a fixed amount to spend and I don't go over that amount	1	2	3	4	5	6	7	8	9	10
[redacted]										
f. When grocery shopping, I'd rather save time than money	1	2	3	4	5	6	7	8	9	10
[redacted]										
h. Double or triple coupons are important in choosing a store	1	2	3	4	5	6	7	8	9	10
[redacted]										
j. I wish someone else could do the shopping	1	2	3	4	5	6	7	8	9	10
[redacted]										
l. I always put off shopping until it has to be done	1	2	3	4	5	6	7	8	9	10
[redacted]										
n. I am always tired when I finish shopping	1	2	3	4	5	6	7	8	9	10
[redacted]										
p. I generally do my shopping at several different stores each month	1	2	3	4	5	6	7	8	9	10
[redacted]										

QUESTIONS ABOUT YOUR GENERAL REACTIONS TOWARD SALTY SNACKS

5. The rest of this survey focuses on the salty snacks product category. What are salty snacks? They're ready-to-eat products that are fried, baked, or popped. Most people think of them as "chips" but they could also include crisps, puffs, and twists (pretzels). They can be eaten out of the package, or with dips and salsa. They do not include crackers, popcorn, nuts, or goldfish.

	Disagree						Agree
b. I always put salty snacks on my shopping list	1	2	3	4	5	6	7
d. Salty snacks contain too many unhealthy ingredients	1	2	3	4	5	6	7
f. There are large differences among salty snack brands.	1	2	3	4	5	6	7
h. When it comes to buying salty snacks, I only have to consider my own preferences	1	2	3	4	5	6	7
j. I don't like substituting other salty snack brands for my acceptable brands.	1	2	3	4	5	6	7
l. The best salty snack brand is hard to judge.	1	2	3	4	5	6	7
n. I have strong feelings about some brands of salty snacks.	1	2	3	4	5	6	7
p. I don't have a strong preference for any particular brand of salty snacks.	1	2	3	4	5	6	7
r. I buy salty snacks for other people, not just for myself.	1	2	3	4	5	6	7
t. I'm involved with several salty snack brands, not just one.	1	2	3	4	5	6	7
v. If my preferred salty snack brand is not available, I prefer to go without than buy another brand.	1	2	3	4	5	6	7
x. I have more commitment to some salty snack brands compared to others.	1	2	3	4	5	6	7
z. When I buy more salty snacks, I expect to eat more of them.	1	2	3	4	5	6	7
bb. I don't think salty snacks are very healthy.	1	2	3	4	5	6	7
dd. The differences among salty snack brands are hard to judge.	1	2	3	4	5	6	7
ff. I don't buy multiple packages of salty snacks because I find them hard to store.	1	2	3	4	5	6	7
hh. I like to have salty snacks around the house.	1	2	3	4	5	6	7

QUESTIONS ABOUT YOUR GENERAL REACTIONS TOWARD SALTY SNACKS

6. To summarize, in my opinion, salty snacks are: (Please rate your opinion for a, b, and c below.)

b. **A positive thing** 1 2 3 4 5 6 7 **A negative thing**

7. We'd also like to determine how involved you are with salty snacks. (Please rate your opinion for a-j below.)

b. **Irrelevant** 1 2 3 4 5 6 7 **Relevant**

d. **Unexciting** 1 2 3 4 5 6 7 **Exciting**

f. **Matter to me** 1 2 3 4 5 6 7 **Do not matter**

h. **Appealing** 1 2 3 4 5 6 7 **Unappealing**

j. **Of no concern to me** 1 2 3 4 5 6 7 **Of concern to me**

NATIONAL AND STORE BRAND SALTY SNACKS

8. As you know, there are both national brands and store brands of salty snacks. Please think about the grocery store you visit most often as you rate your agreement with the statements below about national and store brands.

	Disagree						Agree
b. Purchasing store brands of salty snacks is riskier because they offer less value for the money than national brands.	1	2	3	4	5	6	7
d. Store brands are less expensive, but their quality is also not as good as national brands.	1	2	3	4	5	6	7
f. Store brand salty snacks offer just as good a value for the money as national brands.	1	2	3	4	5	6	7
h. I get more for my money when I buy a store brand instead of a national brand.	1	2	3	4	5	6	7
j. I am willing to trade off the lower quality in store brand salty snacks for their lower price.	1	2	3	4	5	6	7

9. To summarize, in my opinion, national brands of salty snacks are: (Please rate a-c below.)

b. **A positive thing** 1 2 3 4 5 6 7 **A negative thing**

10. To summarize, in my opinion, store brands of salty snacks are: (Please rate a-c below.)

b. **A positive thing** 1 2 3 4 5 6 7 **A negative thing**

10a. And which one grocery store were you thinking of when you answered these questions about store brand salty snacks? (Please circle only one.)

Jubilee Foods 2

Quality Markets 4

Tops 6

Some other store 8

TYPES AND BRANDS OF SALTY SNACKS

11. As you know, there are many different types of salty snacks, such as potato chips, pretzels, and tortilla chips. We'd like to understand how you decide on which types to buy.

	Disagree						Agree
[redacted]							
b. When I buy salty snacks, I first think of the product type before deciding on a particular brand.	1	2	3	4	5	6	7
[redacted]							
d. I often vary the type of salty snack products I buy to reflect different needs.	1	2	3	4	5	6	7
[redacted]							

12. Now we'd like to know which brands of salty snacks are acceptable or unacceptable to you. Please circle one number for each brand.

	ACCEPTABLE	UNACCEPTABLE	NO OPINION
[redacted]			
b. Baked Lay's	1	2	3
[redacted]			
d. Cheetos Cheese Puffs	1	2	3
[redacted]			
f. Fritos Corn Chips	1	2	3
[redacted]			
h. Gardetto's Snack Mix	1	2	3
[redacted]			
j. Pringles Potato Crisps	1	2	3
[redacted]			
l. Rold Gold Pretzels	1	2	3
[redacted]			
n. Santitas Tortilla Chips	1	2	3
[redacted]			
p. Sun Chips	1	2	3
[redacted]			
r. Tops Potato Chips	1	2	3
[redacted]			
t. Tops Tortilla Chips	1	2	3
[redacted]			
v. Wegmans Cheese Puffs	1	2	3
[redacted]			
x. Wegmans Potato Chips	1	2	3
[redacted]			
aa. Wegmans Tortilla Chips	1	2	3
[redacted]			
cc. Wise Potato Chips	1	2	3

HOW YOU DECIDE WHICH SALTY SNACKS TO BUY

13. The next set of questions are about how you decide which salty snacks to buy. Please circle the number which best describes how much you agree or disagree with each statement.

	Disagree						Agree
b. I often buy several different brands of salty snacks at the same time.	1	2	3	4	5	6	7
d. I have strong overall preferences for particular salty snack brands.	1	2	3	4	5	6	7
f. Buying several salty snacks at the same time eliminates the need to go to the store all the time.	1	2	3	4	5	6	7
h. I like to try new brands of salty snacks.	1	2	3	4	5	6	7
j. My preference for brands of salty snacks changes quite often.	1	2	3	4	5	6	7
l. I like several brands of salty snacks, not just one.	1	2	3	4	5	6	7
n. I am often uncertain about my future preferences for salty snacks.	1	2	3	4	5	6	7
p. My preferences for my favorite brand compared to other brands is very strong.	1	2	3	4	5	6	7
r. I rotate my salty snacks brand purchases in response to my need for variety.	1	2	3	4	5	6	7
t. I like to have varied experiences when I eat salty snacks.	1	2	3	4	5	6	7
v. It's easier to buy a variety of salty snacks rather than just the best one.	1	2	3	4	5	6	7

HOW YOU SHOP FOR SALTY SNACKS

14. Now, we'd like to ask you some questions about how you shop in the store for salty snacks. Please circle the number which best describes how much you agree or disagree with each statement.

	Disagree						Agree
[redacted]							
b. End-of-aisle displays have influenced me to buy salty snack brands I normally would not buy.	1	2	3	4	5	6	7
[redacted]							
d. I already know what brands I'm going to buy, so I just buy them without worrying about the price.	1	2	3	4	5	6	7
[redacted]							
f. I rely on in-store displays to remember what brands of salty snacks to buy.	1	2	3	4	5	6	7
[redacted]							
h. I enjoy buying a salty snack product that offers a "2 for 1" deal, regardless of the amount I save by doing so.	1	2	3	4	5	6	7
[redacted]							
j. When I see a deal on salty snacks I stock up.	1	2	3	4	5	6	7
[redacted]							
l. I buy the brand of salty snacks that offers me the best deal.	1	2	3	4	5	6	7
[redacted]							
n. Salty snack prices are pretty much the same.	1	2	3	4	5	6	7
[redacted]							
p. I seldom use deals to buy outside of my acceptable set of brands.	1	2	3	4	5	6	7
[redacted]							
r. I sometimes get a sudden urge in the store to buy salty snacks.	1	2	3	4	5	6	7
[redacted]							
t. I enjoy buying a salty snack brand that offers a "buy-one-get-one-free" deal.	1	2	3	4	5	6	7
[redacted]							
v. When I buy a salty snack product on a "buy-one-get-one-free" offer, I feel I am getting a good deal.	1	2	3	4	5	6	7
[redacted]							

HOW YOU SHOP FOR SALTY SNACKS (Continued from Prior Page)

Please circle the number which best describes how much you agree or disagree with each statement.

	Disagree						Agree
y. When I take advantage of a salty snack "buy-one-get-one-free" offer, I feel good.	1	2	3	4	5	6	7
aa. I have favorite salty snack brands, but if I see a "2 for 1" offer, I am more likely to buy that brand.	1	2	3	4	5	6	7
cc. Once I see salty snacks in my mind, I have to buy them.	1	2	3	4	5	6	7
ee. I often buy salty snacks when I see them next to another product I am buying.	1	2	3	4	5	6	7
gg. I don't believe that "2 for 1" salty snack deals save you much money.	1	2	3	4	5	6	7
ii. Beyond the money I save, buying from salty snack end-of-aisle displays gives me a sense of joy.	1	2	3	4	5	6	7
kk. I know what brands I'm going to buy, but I may change my mind if I see an acceptable brand is on deal.	1	2	3	4	5	6	7

15. Sometimes when you buy salty snacks you may buy just one package. At other times you buy more than one. The next questions explore how you decide on the number of packages to buy.

	Disagree						Agree
b. The number of packages I buy is largely determined by my own personal needs.	1	2	3	4	5	6	7
d. The number of packages I buy is largely determined by the deals I find in the store.	1	2	3	4	5	6	7
f. When I buy more than one package of salty snacks, I am more concerned with price than when I buy just one package.	1	2	3	4	5	6	7

OTHER PRODUCTS

16. We'd like to know which other products you think of buying when you buy salty snacks.

WHEN I BUY SALTY SNACKS, I ALSO THINK OF BUYING....	Disagree						Agree
b. Milk	1	2	3	4	5	6	7
d. Ground beef	1	2	3	4	5	6	7
f. Paper products	1	2	3	4	5	6	7
h. Salsas	1	2	3	4	5	6	7
j. Soup	1	2	3	4	5	6	7
l. Beer/Wine	1	2	3	4	5	6	7
n. Bottled juices	1	2	3	4	5	6	7

ABOUT YOUR SALTY SNACK PURCHASES

The next questions concern your salty snack shopping purchases.

17. How many times in the past month have you purchased salty snacks? _____
(Please write in the exact number.)

18. From which store do you purchase salty snacks most often? (Please circle only one answer under Column #18.)

19. From which other stores do you routinely purchase salty snacks? (Please circle all that apply under Column #19.)

20. What is the name of the store where you last purchased salty snacks? (Please circle only one answer under Column #20.)

	MOST OFTEN COLUMN #18	OTHERS I SHOP COLUMN # 19	LAST TIME COLUMN # 20
Big M	1	1	1
CVS	2	2	2
Jubilee Foods	4	4	4
P&C Markets	6	6	6
Quality Markets	8	8	8
Shur – Fine	10	10	10
Tops	12	12	12
Wegmans	14	14	14
Some other store	16	16	16

21. When was the last time you purchased salty snacks? (Circle only one.)

Today	1
Yesterday	2
Within the past week	3
Within the past two weeks	4
Within the past month	5
More than one month ago	6

ABOUT YOUR SALTY SNACK PURCHASES (Continued from Previous Page)

22. Who went shopping with you on that occasion? (Circle all that apply.)

I was alone	1
Another adult (18 or older)	2
Child or children under 6	3
Child or children 6-12 years old	4
Teen(s) aged 13 - 17	5

23. What type of shopping trip was it? Were you buying.... (Circle only one, please.)

Just a few items for lunch or dinner that day	1
Just a few items to fill in items you ran out of	2
Picking up mainly specials	3
On a major stock-up-shopping trip	4

DESCRIBE YOURSELF

This last part of the questionnaire asks you to describe yourself. Answers to these questions tell us the general characteristics of our survey sample to ensure that it is representative.

24. What is your age? (Please write in your age.)

_____

25. Are you:

Male	1
Female	2

26. Including yourself, how many people are currently living in your household?

_____

27. How many children, if any, are currently living in your home who are:

Under 6 years old	____
6 - 12 years old	____
13 - 17 years old	____

28. What is your work status?

Employed full time outside the home	1
Employed part time outside the home	2
Retired	3
Not employed outside the home	4

29. What is your marital status?

Single	1
Married	2
Widowed	3
Divorced/Separated	4
Other	5

(Describe_____)

30. What is your total yearly household income?

Less than $20,000	1
$20,000 to $29,999	2
$30,000 to 39,999	3
$40,000 to 49,999	4
$50,000 to 59,999	5
$60,000 to 69,999	6
$70,000 to 79,999	7
$80,000 to 89,999	8
$90,000 to 99,999	9
More than $100,000	10

31. What is the highest level of education you have completed?

Less than high school	1
High school diploma	2
Trade school	3
Some college	4
Undergraduate degree	5
Graduate degree or above	6

Thank you for your help. Please return the questionnaire to us in the envelope provided so that we may mail your $10 gift certificate.

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