Lead Products as a New Store Choice Factor: Theoretical Extension and Empirical Verification

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Abstract

Previous research in the store choice literature has largely focused on store-related factors in explaining consumers' store choice behavior, and only a handful of studies have considered both store-related and consumer-related factors. Since both types of factors affect store choice behavior, there is a need for more research on consumer-related factors. Recognizing this need, the current study focuses on "lead products" (a consumer-related factor) as a new store choice factor. It extends the concept of lead products by providing a two-part definition and offering a theoretical base for how lead products *lead* consumers to a particular store. Using the survey data collected at two grocery stores, this study empirically tests and verifies that lead products influence consumers' store choice decisions in the presence of the key store-related factors of store choice (i.e., distance, prices, product quality, and selection). The empirical results also reveal that perishable products and frequently purchased products are more likely to be considered as lead products. For academic researchers, this study provides evidence that lead products are a significant factor for store choice and suggests that lead products should be considered in store choice research. For retail store managers, it provides ways to manage store traffic and perform category management more effectively using lead products.

Introduction

Why does a consumer choose Store A over Store B, C, or D on a shopping trip? This is a critical question that store managers ask themselves every day and that many researchers in marketing and related areas attempt to answer. As the retail environment is becoming tougher and more competitive and consumers are growing more sophisticated, retailers make every effort to draw new customers to their stores and to encourage existing customers to keep patronizing their stores. However, consumers have different and diverse reasons in terms of choosing a particular store over alternative stores. Understanding these reasons in store choice is a formidable challenge.

Many researchers, typically in marketing and geography, have attempted to identify and empirically test factors related to consumers' store choice. Most of the store choice factors identified are store attributes, such as low prices, assortment levels, location, and product quality (e.g., Louviere and Gaeth 1987; Pessemier 1980; Solgaard and Hansen 2003; Woodside and Trappey 1992). These attributes are mainly descriptors of stores and have little to do with shopping trips that consumers make. In grocery shopping settings, a consumer usually plans to buy multiple products on a shopping trip. Depending on the nature of the shopping trip, some products may be more important than others, and thus these products might have the ability to *lead* the consumer to a particular store for the shopping trip occasion. In this case, these products, in fact, play a role of a store choice factor for the consumer on the shopping trip. We term these products as "lead products[1]," following the terminology used by Chen et al. (1999) and argue that lead products are an important factor for consumer store choice decisions. In this

[1] In this paper, we use the term "lead products" interchangeably with the term "lead categories," and, in some cases, "categories" and "supercategories" are used interchangeably as well. Product category boundaries can be vague (Viswanathan and Childers 1999). However, because discussions in this paper do not require specific boundaries or specific composition of product categories, such ambiguity is acceptable.

paper, we define lead products as products on a shopping list that are the most important items and for which the consumer favors a particular store over alternative stores.

The concept of lead products can be illustrated in the following examples. For consumers who are willing to pay premium prices for high-quality organic foods, they would most likely shop at Whole Foods stores because of the retail chain's high-quality organic products (Brady, Carter, and Lacy 2005). On their grocery shopping trips, buying high-quality organic products would be more important than buying other items on their shopping lists. Hence, high-quality organic products would *lead* these consumers to Whole Foods stores, rather than competing grocery stores with weaker quality or selection in organic foods. Another example involves buying clothes. On a shopping trip where buying fashionable, yet affordable clothes takes the priority, a consumer would go to a Target store or a Kohl's store, instead of a Wal-Mart store (Berner 2006; McWilliams and Dodes 2007). If buying general groceries or basic clothing (e.g., underwear) is very important for the shopping trip, the consumer might go to a Wal-Mart store, where the value offering in these categories is perceived as superior. However, when it comes to buying fashion apparel, most consumers do not perceive Wal-Mart as a "fashion mecca." On the shopping trip where buying affordable fashion clothes is very important, these items would *lead* consumers to Target stores or Kohl's stores, where product offerings in apparel are perceived as much better than apparel offerings at Wal-Mart stores.

The purpose of this paper is to extend the concept of lead products theoretically and verify its influence on store choice empirically. More specifically, we address the following three research questions:

(1) Is there a necessary condition for lead products to exist? If so, what is it?

(2) What are the characteristics of lead products?

(3) Can lead products influence store choice decisions? If so, to what extent?

The first research question addresses any preceding condition that is necessary in order for lead products to be formed and attempts to examine consumers' perceptions about product categories and retail stores. The second research question deals with specific characteristics of lead products and the relationship between lead products and product categories. The first two research questions lay the foundation for the third research question, which is a key research question in this paper: Can lead products influence consumers' choice of stores? A more interesting issue regarding this research question is whether lead products can have significant explanatory power for store choice decisions in the presence of the traditionally valued factors for store choice, such as distance, price, product quality, and selection. If so, this would establish lead products as a valid factor of store choice in the literature.

In order to answer the three research questions, we collected data using a survey instrument at two grocery stores in a Midwestern city. The data analysis confirms that lead products can influence consumers' store choice decisions along with prices, location, selection, and product quality. A series of regression analyses and a likelihood ratio (LR) test show that lead products significantly explain the variations in store choice decisions while prices, location, selection, and product quality are included as control variables. In terms of answering the first research question, the results reveal that consumers form an association between multiple product categories and the most preferred store for the categories. Regarding the second research question, it is found that perishable products and frequently purchased products are more likely to be considered as lead products. All of these findings validate the significance of lead products in store choice and thus enhance our understanding of store choice behavior.

This paper makes important contributions to the store choice literature. One contribution is that this paper offers a theoretical explanation, based on the consideration set theory, how lead products influence consumers' store choice decisions. This paper is also one of the few studies that apply the consideration set theory to store choice settings, while most studies on the consideration set theory deal with brand choice situations (e.g., Nordfalt et al. 2004; Roberts and Lattin 1991). This paper makes another important contribution to the literature by providing empirical evidence that lead products are a viable factor for store choice. Past studies on store choice have focused mostly on store attributes or store characteristics to explain and predict store choice behavior. But, few studies have paid attention to the notion that some products that consumers plan to buy can influence store choice decisions. This paper fills this gap in the literature of store choice by empirically showing that lead products can influence store choice decisions.

Literature Review

Since lead products are relatively a new concept in the marketing literature, there are only a handful of studies that investigated lead products or related concepts. The only study that directly addresses lead products is Chen et al. (1999). They used the term "lead category" for the first time and define it as the first item on the shopping list. The concept of lead category plays a critical role in calculating "marketing profits," which is a marketing-based profit measure, as opposed to accounting profits. Another study that examines a concept similar to lead products is Drèze and Hoch (1998). They classify products into two types, Type 1 and 2. Type 1 products are those that "are associated with a particular store", and Type 2 products are those that "are not associated with any particular store and are randomly bought" at stores (Drèze and Hoch 1998, p.

461). Using two field tests, they show that retailers can successfully transform Type 2 into Type 1 products and increase the sales of Type 2 products. Though the concept of Type 1 products is not the same as lead products defined in this paper, it is closely related to lead products because in order to determine Type 1 products, consumers need to form associations between product categories and the most preferred stores for the product categories. These associations are a precondition preceding formation of lead products. As such, this paper extends the concept of Type 1 products by linking it with store choice, utilizing the conceptualization of lead category by Chen et al. (1999). Combining these two concepts, we define lead products as products on a shopping list that are the most important items and for which the consumer favors a particular store over alternative stores.

Review on store choice

An important research stream relevant to this paper is research on store choice. Store choice is one of the heavily studied areas in marketing (e.g., Aaker and Jones 1971; Hisrich, Dornoff, and Kernan 1972; Hortman et al. 1990; Kahn and Schmittlein 1989; Kau and Ehrenberg 1984; Monroe and Guiltinan 1975; Pessemier 1980; Popkowski Leszczyc, Sinha, and Timmermans 2000; Solgaard and Hansen 2003; Uncles and Hammond 1995) and geography (e.g., Moore 1990; Wrigley and Dunn 1988). Since the early 1980s, researchers in this research stream have focused mostly on store attributes to analyze and explain store choice behavior based on those store attributes. Store attributes that past research has examined are shown in Table 1. Among the various store attributes examined, four attributes have received greater attention than others: low prices, assortment levels, distance/location, and product quality. Most

researchers have found that these four store attributes have a significant impact on consumers' store choice decisions (e.g., Moore 1990; Solgaard and Hansen 2003).

Insert Table 1 about here

The factors considered in the past literature on store choice can be grouped into two types: (1) factors related to stores and (2) factors related to consumers (e.g., store loyalty, shopper's age, number of shopping trips, etc.). The vast majority of studies in the store choice literature have focused on factors related to stores while a handful of studies (i.e., Bell and Lattin 1998; Bucklin and Lattin 1992; Volle 2001; Woodside and Trappey 1992) have examined both types of factors. Since both store-related and consumer-related factors influence consumers' store choice decisions, this finding suggests that more research needs to be conducted on consumer-related factors in order to enhance our understanding of store choice decisions further.

Although some studies considered consumer-related factors in explaining store choice behavior, few studies have examined as a store choice factor items that consumers plan to buy. Product categories at retailers competing in the same business (e.g., grocery stores) are not identical due to different strategic focus, different suppliers, different brands carried, or different display. Consumers typically plan to purchase items in multiple product categories on their shopping trips and choose a store that they believe will satisfy their shopping needs best. If some categories they plan to buy are important for a shopping trip, they may influence store choice decisions because consumers usually know which store is the best for those important categories. This process could be a valid reason why consumers choose a particular store over other alternatives. However, past research in the store choice literature has overlooked this process. In this paper, we address this process theoretically and empirically to increase our overall understanding of how consumers make store choice decisions.

Review on loss leaders

A loss leader is defined as a product or service that is promoted at a price close to, or sometimes below, retail cost (Walters and MacKenzie 1988). In grocery business, loss leaders are frequently purchased products like bread, milk, and eggs or well-known brand names like Coke (Levy and Weitz 2007). The concept of loss leader is a time-honored tactic among retailers (Chevalier, Kashyap, and Rossi 2003) and recently firms in industries other than retailing have started applying the concept to their businesses as a way to improve their performance (Clift 1999). The goal of using loss leaders is to increase customer traffic for the retailer so as to sell regularly priced products in addition to the specially priced products (i.e., loss leaders) (Berman and Evans 2001). The idea behind this goal is that while customers are in the store to get loss leaders, they buy other products that generate high profit margins (Hess and Gerstner 1987; Walters and Rinne 1986). In this sense, loss leader promotion can be interpreted as a bundling strategy in which stores bundle regularly priced products with loss leader products (Hess and Gerstner 1987).

Most research on loss leaders has investigated the effect of loss leaders on store performance. For example, Walters and Rinne (1986) found that loss leaders have an impact on store traffic, store sales, and deal sales, but they don't have a significant impact on store profits. Taking a different research approach, Hess and Gerstner (1987) use a formal model to study loss-leader pricing and show that it is in the best interest of retail stores to price some products below marginal cost to attract consumers into the store and make profits through impulse purchase of other products. Using structural equations modeling, Walters and MacKenzie (1988) found that most loss leader promotions have no effect on store profits and those loss leaders that affect profits do so through their effect on store traffic rather than through their effect on sales of the

promoted products, which is consistent with the findings of Walters and Rinne (1986). In a study of pricing and advertising strategies, Lal and Matutes (1994) use an analytic model to show that if retail stores advertise prices below marginal cost to attract consumers, they can generate profits from other goods that consumers plan to buy at the store. In summary, it appears that empirical and analytical studies offer mixed messages regarding loss leaders. While analytical studies have suggested that retail stores can generate more profits using loss leader promotions, empirical studies have failed to find a positive relationship between loss leaders and store profits. These mixed findings warrant more research in this area.

Loss leaders and lead products share some similarities, yet they are different concepts. They both rely on the idea that some products attract consumers into a store and the consumers buy other products as well while they are in the store. This idea is the reason why loss leaders are appealing to store managers. Although in some cases loss leaders can be lead products, there is a significant difference between the two concepts. Typically, loss leaders are designed to increase store traffic as a part of overall promotion strategy. Thus, they tend to last only for a limited time period (Walters and MacKenzie 1988). On the other hand, lead products are longer-term oriented. Generally, they are not associated with promotion strategies, but are related to stored perceptions in consumers' minds about which store is the best for a product or product category. It takes time to develop such perceptions, and thus it is not likely that they will be lost in consumers' mind in a short period of time. Therefore, lead products influence consumers' store choice longer than loss leaders can. Using Grunert's (1988) classification, we categorize lead products as "automatic cognitive processing" (which is mostly unconscious and is learned and changed very slowly) and loss leaders as "strategic cognitive processing" (which is

conscious thinking and can be easily adapted to situational circumstances) (Woodside and Trappey 1992).

Another difference is that loss leaders are store-driven while lead products are consumer-driven. In most cases, store management takes the initiative in selecting products that the store promotes as loss leaders. This is a strategic decision in order to increase store traffic and total sales in the store. On the other hand, individual consumers choose lead products among the items they plan to buy, based on category attributes of stores, importance of products, etc. Thus, loss leaders and lead products are determined by different parties whose interests conflict with each other.

Hypotheses Development

Before visiting a retail store, consumers usually make a shopping list (either physical or mental) and use some base items on the shopping list to help choose a retail store they will visit. We call these base items on the shopping list which influence store choice, "lead products." The other items on the shopping list do not influence consumers' store choice, and thus are called "ancillary products." Once consumers choose a particular retail store to visit, they often purchase not only the items on the shopping list but also some products not included in their plans.

For example, suppose that a consumer has invited a few friends for a get-together and has a shopping list of wine, cheese, pasta to prepare for the get-together. Since one of the friends is a wine expert, selecting good wine is very important for the shopping trip. In this case, wine plays an important role as a lead product, and cheese and pasta are ancillary products. Considering wine as a basis of store choice, the consumer chooses a grocery store that is the best for wine in

terms of quality and assortments. At the grocery store, the consumer buys items on the shopping list (wine, cheese, and pasta) but also a box of strawberries (an unplanned purchase) on sale.

Characteristics of Lead Products

What factors determine which items on the shopping list will be lead products? There are two important factors. The first factor is the purpose of the shopping trip. For example, if a consumer makes a shopping trip for a birthday party, birthday cake might be the most important item on the shopping list for the trip. The second factor is associations between product categories and the most preferred stores for those product categories. If consumers form such associations, they choose a store that they prefer the most for the most important items on the shopping list. In other words, the most important items lead consumers to a particular store, based on associations between the most important items and the most preferred store for the items. Of course, if all stores are considered equivalent for a product category, then items in the product category would not play a role of lead products. The remaining section focuses on the second factor, which is more meaningful to researchers and more controllable by store managers.

In order for lead products to play a significant role in store choice, it is critical that consumers form associations between these product categories and the stores in their consideration sets. These associations can be construed as part of forming store image, which has been found to affect preference for stores (Thang and Tan 2003). Mazursky and Jacoby (1986) classify important components of store image into three groups: (1) merchandise-related aspects (e.g., quality, pricing, assortment), (2) service-related aspects (e.g., salespeople's service), and (3) pleasantness of shopping at the store. Among these three groups, associations between product categories and stores are related to the merchandise-related aspects of store image.

Similar to store image formation, consumers form perceptions or images of product categories that stores carry, based on previous shopping experiences at the stores. If those perceptions for a certain product category at a store stand out, consumers likely keep the store's name in their memory. For example, after a number of visits to stores, consumers may develop perceptions that fruits are the best at Store A, dairy products are the best at Store B, and meat is the best at Store C. As such, past shopping experiences at various stores allow consumers to form perceptions that link each product category to one store that consumers perceive as the best store for the product category.

H1: Consumers form an association between each product category and the most preferred store for the product category.

Insert Table 2 about here

Now consider which categories are likely to be lead products. For perishable product categories, which are defined in Table 2, (perceived) "freshness" is a very important attribute to assess product quality. Since these products are easily perishable, consumers take care when they buy these products. Even though consumers expect fresh products, stores carry such products with varying degrees of freshness because freshness depends on producers that the stores deal with, distribution channels that the stores use, and turnover rates of such products. In other words, initial product quality before shipment, shipping time from initial producers to store, and duration of display determine freshness of such products when consumers check those products for purchase. If consumers have sufficient experiences on perishable products to

compare freshness across stores, they would likely choose the store that they perceive offer the freshest products. Therefore, those products would likely serve as lead products.

On the other hand, for non-perishable products (e.g., consumer packaged goods), variations of product quality across stores are small because initial quality of those products are the same or similar, and shipping time from manufacturers to store and duration of display affect quality of such products at stores in a lesser degree. Since quality levels of non-perishable products across stores are not much different, those products are less influential in consumers' store choice. The above argument is consistent with many observations and research findings that perishable categories drive grocery store traffic and are important for store image and store profitability (Progressive Grocer 1993; Tsiros and Heilman 2005). In a broader context, perishable products include products with a short shelf life, such as high-fashion merchandise. Therefore, we argue:

H2: Perishable products are more likely to be considered as lead products than non-perishable products.

We would argue that consumers are more likely to choose frequently purchased products as lead products than infrequently purchased products. If consumers purchase a product frequently, they would have ample experiences of buying the product at various stores. This gives them greater ability to assess prices, quality, assortments, and promotion frequency of the product at stores and compare the stores to determine the best store for the product. If a frequently purchased product is the lead product for a shopping trip, then consumers have a clear idea about to which store they should go. Thus, it would make the store choice decision easier for consumers if they choose a frequently purchased product as the lead product for a shopping

trip. Infrequently purchased products, however, create fewer opportunities for gathering information on prices, quality, assortments, and promotion frequency at stores, and thus consumers are less sure of which store they should go to when an infrequently purchased product is a lead product. Moreover, infrequently purchased products are less likely listed on shopping lists than frequently purchased products (Block and Morwitz 1999; Kollat and Willet 1967). Because one component of lead products is being the most important items on the shopping list, if frequently purchased products are more likely listed on shopping lists, they are more likely to be chosen as lead products than infrequently purchased products.

H3: Frequently purchased products are more likely to be considered as lead products than infrequently purchased products.

Lead Products and Store Choice

Research on store choice has identified a number of factors that influence consumers' store choice (e.g., Ahn and Ghosh 1989; Louviere and Gaeth 1987; Solgaard and Hansen 2003). Of those factors, distance to the store and location have been considered the dominant factors for store choice, and many researchers have empirically found these factors' strength in influencing consumers' store choice decisions (Arnold, Oum, and Tigert 1983; Hortman et al. 1990; Solgaard and Hansen 2003). Other important factors include low prices, assortments, product quality, parking facilities, store service, promotions, staff friendliness, checkout speed, store cleanliness, and so forth (see Table 1 for a more complete list of store choice factors). These factors are found to be characteristics or attributes of stores that consumers evaluate when making store choice decisions.

Although previous research has provided an extensive list of attributes of stores that affect consumers' store choice, most of those attributes are not related to consumers' decision-making processes, such as what kinds of products consumers plan to buy and how those products influence store choice. Such decision-making processes could be more important in evaluating consumers' store choice decision than store attributes could, because those processes are directly related to how consumers evaluate and compare product categories across retail stores in their consideration sets. The concept of lead products reflects such processes and thus provides a new perspective on store choice.

Lead products on a shopping list capture the processes with which consumers choose particular stores by identifying base items on the shopping list that are critical for the store choice decision. For example, suppose that a consumer has a shopping list of tomatoes, cheese, and cereal. Even though the consumer needs all three items for the shopping trip, the consumer might choose tomatoes as a lead item for store choice because she/he can buy cheese and cereal at most grocery stores but not all grocery stores carry tomatoes with the levels of freshness and quality the consumer desires. Thus, tomatoes "influence" the consumer to choose a store that the consumer perceives as the best store for tomatoes and become the lead product for the shopping trip. In this sense, tomatoes play a role of a "hot button" for the store the consumer chooses (Tigert 1983; Woodside and Trappey 1992). On the other hand, ancillary products (i.e., cheese and cereal) are not critical for the store choice decision because they do not vary much across grocery stores in terms of (perceived) product quality and assortments. Thus, such ancillary products are not an important factor for store choice decision.

A theoretical foundation for lead products' influence on store choice can be found in the consideration set theory (Desai and Hoyer 2000; Fotheringham 1988; Hauser and Wernerfelt

1990; Kahn and McAlister 1997; Nordfalt et al. 2004; Roberts and Lattin 1991). Although most of the studies on the consideration set theory deal with brand choice situations, the theory can be applied to store choice situations as well. The theory suggests two stages for decision-making in store choice situations (Hauser and Wernerfelt 1990). In the first stage, consumers build a consideration set of stores. Based on past shopping experiences at stores and their shopping needs, consumers select a group of stores they usually patronize from the list of all available stores. In the second stage, they choose a store from the consideration set. Since choosing a store from a consideration set is a cognitive burden, consumers attempt to reduce decision costs (Hauser and Wernerfelt 1990) or the effort required to choose from a consideration set (Desai and Hoyer 2000).

One way to cope with this problem is using lead products. Since lead products are the most important items on the shopping list, and since there are associations between product categories and the most preferred stores, once lead products are identified, they tell consumers to which store to go. This reduces the cognitive burden for consumers in choosing a store from a consideration set. Through these processes, lead products influence consumers' store choice decisions. Thus, we propose the following hypothesis:

H4: Lead products influence consumers' store choice decisions.

Research Methodology

To test the hypotheses proposed in the previous section, we used a survey instrument. The survey was conducted for six days at two grocery stores (Store A and Store B) in a mid-size city in the Midwest. Because these two stores are direct competitors in the local area, this makes the stores appropriate venues for data collection for this study. We alternated the two stores during the survey period to assign the same number of weekdays and weekend days to each store

(i.e., Thursday, Saturday, and Monday at Store B and Friday, Sunday, and Tuesday at Store A) in order to reduce sampling error. We also chose the busiest time of the day to be able to recruit as many diverse shoppers as possible and distribute questionnaires efficiently.

The questionnaire we used consists of four blocks of questions: (1) respondents' general shopping behavior, (2) planning and characteristics of the grocery shopping trip that they made, (3) their perceptions on various attributes of the grocery store they visited, and (4) demographic information. Given the research objectives of this study, the second block is the most important part of the questionnaire. Specifically, the second block contains the following key questions: (1) a question that asks respondents to list lead product (without using the term "lead products"), (2) a question that asks if respondents considered distance, overall prices, overall assortment level, and/or overall product quality for store choice, and (3) a question that asks the best products or product categories at the store that respondents went to for the shopping trip. The rest of the questions in the first, third, and fourth blocks are typical questions that can be found in similar research.

The procedures for approaching potential respondents are as follows. First, we identified a potential respondent who was exiting the store with purchased products and who was needed for representative sampling. We approached the potential respondent, followed by introducing ourselves and explaining the purpose of the survey. We then asked the respondent if he/she would be willing to participate in the survey. If the respondent agreed to participate, we gave a questionnaire and a self-addressed envelope with postage paid, and asked the respondent to fill it out at home and mail it to the address shown on the envelope. At this point, the respondent was notified that a monetary incentive (i.e., a brand-new one-dollar bill) was enclosed in the envelope. A monetary incentive was used to increase response rate and was given before respondents

completed questionnaires. This procedure follows previous research that shows that prepayment has significant positive effects on response rate (Berry and Kanouse 1987; Fowler 2002; Jobber, Saunders, and Mitchell 2004). Finally, we expressed appreciation for participation in the survey before leaving the respondent.

During the survey period, in total 534 questionnaires were distributed, and 376 respondents returned their questionnaires. However, six of the returned questionnaires were unusable because some of them were returned blank and the others contained too many unanswered questions. Hence, excluding these unusable questionnaires, the effective response rate was 70% (i.e., 371 out of 534), which appears quite high. However, this is not surprising because all the respondents "volunteered" to participate in the survey. We distributed the questionnaires near the entrances of the grocery stores, following the in-person delivery protocol suggested by Dillman (2000) for situations where an adequate population list is difficult to obtain, such as customers of a restaurant or a retail store. We suspect that the protocol and the salience of the survey contributed to the high response rate of our survey. Our response rate is consistent with the response rate (75%) in a National Park Service study conducted by Dillman, Dolsen, and Machlis (1995) using a similar protocol.

Among the 371 respondents, 73% of them were female, 26% were male, and 1% did not indicate their gender. These percentages of female and male shoppers are typical in grocery shopping survey research (e.g., Progressive Grocer 2003; Sethuraman 2003). The average age of the respondents was 45, and they had lived in the city for about five years on average. Households with 2 – 4 members accounted for 74% of the total households. In terms of education level, 70% of the respondents had either a college degree or a master's degree. The median household income was in the bracket of $65,000 - $74,999, which is higher than the

median household income ($32,795) and the median family income ($52,628) in the city in 2000 (U.S. Census Bureau 2000). The high education level and the high median household income reflect the consumer segments that the two grocery stores serve. Store A is located near relatively wealthy neighborhoods, and Store B draws high-income consumers with superior category management and better atmospherics. Because of these characteristics, Store A and Store B serve more educated and more affluent consumer segments, compared to the other grocery stores in the city.

In terms of the respondents' shopping behavior, 41% of them made a physical shopping list prior to the shopping trip. Forty-four percent of the respondents were Store A customers, and 56% were Store B customers. On average, the respondents purchased 21 items and spent $50.15. Their median number of grocery shopping trips was 8 times per month, and they patronize about 3 stores for grocery shopping on average. Finally, among the respondents who did not make a physical shopping list, 86% of them reported that they had planned the shopping trip beforehand. Table 3 describes statistics on important descriptive variables by store.

Insert Table 3 about here

Nonresponse Bias

Nonresponse bias occurs "when a significant number of people in the survey sample do not respond to the questionnaire *and* have different characteristics from those who do respond, when these characteristics are important to the study" (Dillman 2000, p. 10). It is a major source of survey error and needs to be addressed properly (Fowler 2002). In the marketing literature, most studies that utilized survey instrument test for nonresponse bias by comparing early respondents with late respondents on key constructs and variables (e.g., Homburg and Bucerius

2005; Joshi and Sharma 2004). This is based upon the assumption that respondents who respond less readily are more like nonrespondents (Armstrong and Overton 1977). Following this practice, we tested for nonresponse bias by comparing the early and late respondents on key variables.

Tests for nonresponse bias showed that there were no significant differences between the early and late respondents on key variables, except age. Sixty-six percent of the respondents mailed their questionnaires within the two days after they were given a questionnaire at the grocery stores, and 36% mailed them after the second day. Using t-tests at the 5% significance level, we compared these two groups of respondents on sales amount, the number of grocery shopping per month, the number of stores patronized per month, the number of household members, residence period in the city, gender, education level, household income, age, and the number of lead products. The t-test results show no significant differences on the variables used, with one exception of age. The means of the two groups in age are 46 and 42. Though the mean difference is statistically significant, it is not large enough in a practical sense to raise concern. Therefore, we conclude that overall the early and late respondents are not different, and thus that nonresponse bias is not significant in the survey.

Empirical Results

Hypothesis H1

This hypothesis is tested on each supercategory[2] using data obtained from the survey. For each supercategory, respondents were coded as 1 if they provided a store name for the best store in a supercategory and 0 if they did not. Then, a sample proportion ($\hat{p}$) was calculated by

[2] As defined in Table 2, supercategories include dairy, frozen food, meat/seafood, produce, bakery, deli, floral, grocery, general merchandise, health & beauty, and liquor (Chen et al. 1999).

counting the number of respondents who were coded as 1. This sample proportion was used to test the following null hypothesis ($H1_0$) and the alternative hypothesis ($H1_A$):

$H1_0$: Consumers do not form an association between each product category and the most preferred store for the product category. (p = 0)
$H1_A$: Consumers form an association between each product category and the most preferred store for the product category. (p = 1)

If a sample proportion for a supercategory is significantly different from zero, we reject $H1_0$ in favor of $H1_A$, and H1 is supported for that supercategory. If, however, a sample proportion is not significantly different from zero, we cannot reject $H1_0$, and H1 is not supported. For this one-tailed test, the following test statistic was used:

(1) $$z = \frac{\hat{p} - p}{\sqrt{\frac{\hat{p}(1-\hat{p})}{N}}},$$

where N is the total number of respondents in a supercategory (Hogg and Tanis 1997). Note that the two *p*'s in the denominator are replaced with the sample proportion to avoid dividing the numerator by zero. The test was performed based on standard normal distribution.

Insert Table 4 about here

The sample proportion and the *z* value for each supercategory are shown in Table 4. Since all *z* values are greater than $z_{0.05} = 1.645$, we reject $H1_0$ in favor of $H1_A$ in all supercategories at the 5% significance level. Therefore, H1 is supported in all categories.

Hypothesis H2

The testing procedure is similar to that for Hypothesis H1, except that the data source for this hypothesis came from a different part of the questionnaires. Table 2 describes which

supercategories are perishable and non-perishable. Each of product names provided as a lead product in the questionnaires was coded as 1 if it was in perishable supercategories and as 0 if it belonged to non-perishable supercategories. Based on this coding, a sample proportion for perishable supercategories ($\hat{p}_{PRSH}$) was calculated by dividing the number of lead products in perishable supercategories by the number of lead products in all supercategories.

The original hypothesis can be translated to the following null and alternative hypotheses:

$H2_0$: Less than half of all lead products are in perishable supercategories. ($p_{PRSH} \leq 0.5$)

$H2_A$: More than half of all lead products are in perishable supercategories. ($p_{PRSH} > 0.5$)

The null hypothesis suggests that if less lead products are in perishable supercategories than in non-perishable supercategories, we cannot reject the null hypothesis. Otherwise, we reject the null hypothesis. The following test statistic was used for testing the null and alternative hypotheses:

(2) $$z = \frac{\hat{p}_{PRSH} - p_{PRSH}}{\sqrt{\frac{p_{PRSH}(1 - p_{PRSH})}{N}}},$$

where N is the total number of lead products provided in the questionnaires (Hogg and Tanis 1997).

The test result shows that H2 is supported. The respondents reported 344 lead products in perishable supercategories and 112 lead products in non-perishable supercategories, which brings the total number of lead products to 456 (i.e., N = 456). With this information, the sample proportion for perishable supercategories is calculated to 0.754 (i.e., $\hat{p}_{PRSH} = 0.754$). Thus, the calculated z value is 10.848. Since the z value is greater than $z_{0.05} = 1.645$, we reject $H2_0$ in favor of $H2_A$ at the 5% significance level. Therefore, H2 is confirmed.

Hypothesis H3

The testing procedure for Hypothesis H3 is identical to that for Hypothesis H2, except that two groups are now frequently purchased supercategories and infrequently purchased supercategories, which are defined in Table 2. Each lead product provided in the questionnaires was coded as 1 if it was in frequently purchased supercategories and as 0 if it belonged to infrequently purchased supercategories. Based on this coding, a sample proportion for frequently purchased supercategories ($\hat{p}_{FQ}$) was calculated by dividing the number of lead products in frequently purchased supercategories by the number of lead products in all supercategories.

The original hypothesis can be transformed to the following null and alternative hypotheses:

$H3_0$: Less than half of all lead products are in frequently purchased supercategories. ($p_{FQ} \leq 0.5$)

$H3_A$: More than half of all lead products are in frequently purchased supercategories. ($p_{FQ} > 0.5$)

The null hypothesis suggests that if less lead products are in frequently purchased supercategories than in infrequently purchased supercategories, we cannot reject the null hypothesis. Otherwise, we reject the null hypothesis. The following test statistic was used for testing the null and alternative hypotheses:

(3) $$z = \frac{\hat{p}_{FQ} - p_{FQ}}{\sqrt{\frac{p_{FQ}\left(1 - p_{FQ}\right)}{N}}},$$

where N is the total number of lead products provided in the questionnaires (Hogg and Tanis 1997).

The test result shows that H3 is supported. The respondents reported 334 lead products in frequently purchased supercategories and 122 lead products in infrequently purchased supercategories, which brings the total number of lead products to 456 (i.e., N = 456). With this information, the sample proportion for frequently purchased supercategories is calculated to 0.733 (i.e., $\hat{p}_{PRSH} = 0.733$). Thus, the calculated z value is 9.951. Since the z value is greater than $z_{0.05} = 1.645$, we reject $H3_0$ in favor of $H3_A$ at the 5% significance level. Therefore, it is confirmed that the majority of lead products are in frequently purchased supercategories.

Hypothesis H4

We used discrete response model to test hypothesis H4. Since hypotheses H4 deal with consumers' store choice, the variable to be explained is a random variable taking on a finite number of outcomes (e.g., a choice between the two grocery stores). In this study, because there are only two choice alternatives (i.e., Store A or B), the discussion about choosing an appropriate model is restricted to a binary response model. Specifically, we use the logit model to test Hypothesis H4.

In testing Hypothesis H4, we followed the general-to-specific approach, which is also called the LSE (London School of Economics) approach (Hoover and Perez 1999). A sufficiently complicated model (i.e., the general model) can describe the salient features of the real world. Any more parsimonious model is an improvement on such a complicated model if it contains all of the same information in a simpler, more compact form. The objective of the LSE approach is to find models that are valid parsimonious restrictions of the completely general model. The LSE approach starts with the general model and reduces the general model to a more parsimonious model that reflects the true specification. The LSE approach is more appropriate

than the specific-to-general approach, which builds the most parsimonious model to the true specification, when one can construct a comprehensive general model based on theories or previous research.

The General Model

Following the LSE approach, a comprehensive general model is constructed based on hypothesis H4. The general model contains all the variables suggested by hypothesis H4 (i.e., lead category dummies for eleven supercategories), as well as seven control variables and an intercept. This general model serves as the unrestricted (or base) model, against which hypothesis H4 is tested. The regression model for the general model is shown below in Equation (4). Table 5 describes the variables used in the regression model. Based on this regression model, a binary logit regression was run, with the estimated model shown in Table 6. Table 7 shows the eleven lead category dummies that were included in the regression and describes how the four weighted variables in Table 6 were calculated.

$$\begin{aligned} Y = {} & \beta_0 + \beta_1\, dr + \beta_2\, ff + \beta_3\, ms + \beta_4\, pd + \beta_5\, bk + \beta_6\, dl + \beta_7\, fl + \beta_8\, gc + \beta_9\, gm + \beta_{10}\, hb \\ & + \beta_{11}\, lq + \lambda_1\, distance + \lambda_2\, quality + \lambda_3\, price + \lambda_4\, assortment + \lambda_5\, hhmember + \lambda_6\, sex \\ & + \lambda_7\, hhincome + \varepsilon \end{aligned} \tag{4}$$

Insert Table 5 about here

Insert Table 6 about here

Insert Table 7 about here

Test of Hypothesis H4

Hypothesis H4 is tested using the likelihood ratio (LR) test. If both the unrestricted and restricted models are easy to estimate, the LR test is more useful than the Wald test and the Lagrange multiplier (LM) test (Wooldridge 2000; Wooldridge 2002). The LR test is based on the same concept as the *F* test in a linear regression model and compares the difference in the log-likelihood functions for the unrestricted and restricted models to test if the fall in the log-likelihood resulted from dropped variables is significantly large. For hypothesis H4, all variables that are associated with the lead category dummies for eleven supercategories need to be dropped to form the restricted model. The number of such variables is eleven. The regression model for the restricted model is, then, expressed as Equation (5).

$$(5) \quad Y = \beta_0 + \lambda_1 \text{ distance} + \lambda_2 \text{ quality} + \lambda_3 \text{ price} + \lambda_4 \text{ assortment} + \lambda_5 \text{ hhmember} + \lambda_6 \text{ sex} + \lambda_7 \text{ hhincome} + \varepsilon$$

Hence, from Equations (4) and (5), the null and alternative hypotheses for the LR test are constructed as

H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = \beta_9 = \beta_{10} = \beta_{11} = 0$

H_A: H_0 is not true.

Using the estimation results in Table 6 and 8, the LR test statistic is calculated: $LR = 2(L_{UR} - L_R) = 17.289$, where L_{UR} is the log-likelihood value for the unrestricted model, and L_R is the log-likelihood value for the restricted model. The critical value for this test is the 90th percentile in the χ^2_{11} distribution because there are eleven restrictions. Since the LR test statistic is larger than the critical value ($\chi^2_{11} = 17.28$ at the 10% significance level), we reject H_0. Therefore, H4 is supported, and we can say that lead categories as a group can significantly explain store choice behavior and thus supports the core premise of this paper.

Insert Table 8 about here

Discussion

The objective of this paper is to better understand lead products and their influence on store choice. For this objective, we developed four hypotheses based on the past literature and tested the hypotheses using the data collected through a survey instrument. The results from the proportion tests supported the hypotheses regarding the characteristics of lead products (i.e., H1 – H3). Specifically, the proportion tests found that consumers form an association between each product category and the most preferred store for the product category (H1). This finding confirms that the precondition preceding lead product formation does exist, and provides evidence that consumers experience the precondition stage before determining lead products.

The proportion tests based on counting of lead products also found that perishable products (H2) and frequently purchased products (H3) are more likely to be considered as lead products. This finding suggests that not every product can be a lead product, but some types of products, such as perishable and frequently purchased products, more likely play a role of lead products.

As for the hypotheses regarding the influence of lead products on store choice, the binary logit regressions and an LR test supported the hypothesis (H4) that lead products as a group can influence consumers' store choice decisions. In other words, lead products in all product categories as a whole can explain consumers' store choice behavior. The core premise of this paper is that lead products can influence consumers' store choice behavior, and the result of the test provides empirical evidence for the premise. What is also noticeable is that the test result was obtained in the presence of the traditionally valued store choice factors, i.e., distance, price

level, product quality, and assortment level, whose coefficient estimates were highly significant as we expected. This manifests the ability of lead products in explaining consumers' store choice decisions in the presence of the previously validated store choice factors. This finding accords legitimacy to lead products as a viable store choice factor and thus enhances the understanding of store choice behavior among consumers.

Though the test of H4 found that lead products as a group can influence consumers' store choice decisions, another interesting question would be the following: Which product categories influence consumers' store choice decisions? Once we know that lead products can indeed influence store choice, the natural next step is to pinpoint which lead products or categories influence store choice decisions.

Based on the regression results in Table 6, the following three supercategories emerged as those that influenced store choice: meat/seafood, grocery, and liquor. The coefficient estimates for meat/seafood and grocery were marginally significant, but the coefficient estimate for liquor was very significant, which is quite surprising. This can be explained by the fact that 71% of the respondents who reported liquor as one of their lead categories shopped at Store B, although only 24 respondents had liquor as their lead category. Wine purchase is the driving force behind this result. Wine section at Store B is much better than that at Store A, in terms of assortments (both domestic and imports), prices, promotions, and display. Hence, for some Store B customers, Store B is their preferred store for wine. When they plan to buy wine for a shopping trip, wine reminds them of Store B as the best store to buy wine, and this influences them to choose Store B for the shopping trip. This suggests that it is important to develop and manage images for product categories using pricing, product quality, selection, and promotions, as well as overall store image. A good image of a product category at a store can make the

product category a lead category on consumers' shopping lists, and the lead category will lead consumers to the store.

The regression results in Table 6 shows that meat/seafood and liquor increase store choice probability for Store B, and grocery increases store choice probability for Store A. Since the coefficient estimates of meat/seafood and liquor are negative and the dependent variable used in the regression is 0 if Store B and 1 if Store A, meat/seafood and liquor as lead categories increase the probability that a consumer will shop at Store B. However, grocery as lead category increases the probability that a consumer will shop at Store A because the coefficient estimate of grocery is positive. To measure exactly how much these three supercategories increase store choice probability for Store A or Store B, we calculated the marginal effects of these three supercategories using the method suggested by Greene (2003) and Wooldridge (2002). The results are provided in Table 9. Based on the calculation, if a female consumer has meat/seafood as a lead category, the probability that she will choose Store B will increase by 17.8%, holding all other variables fixed. For a male shopper, the probability that he will choose Store B will increase by 14.5%. When grocery is a lead product, the probability that a consumer (female or male) will choose Store A will increase by about 20%, holding all other variables fixed. If a female consumer has liquor as a lead category, the probability that she will choose Store B will increase by 34%, which is a substantial increase in store choice probability. For a male consumer, the probability that he will choose Store B will increase by 26%. Overall, the marginal effects of the three supercategories are very significant in a practical sense.

Insert Table 9 about here

Contributions and Managerial Implications

This paper is a substantial extension of Chen et al. (1999) and provides a better understanding of lead products. To our knowledge, Chen et al. (1999) are the first researchers who used "lead category." However, they did not delve into the concept of lead category because their primary focus was to calculate marketing profits. While they simply define lead category as "the first item on the shopping list," we developed a formal, two-part definition of lead products in this paper: lead products as 1) products on a shopping list that are the most important items and 2) for which the consumer favors a particular store over alternative stores. We also investigated characteristics of lead products, such as preconditions and types of lead products. Building on the initial concept of lead category used by Chen and his colleagues, this paper provides more in-depth knowledge on lead products.

This paper makes a contribution to the literature on store choice by offering a theoretical explanation how lead products influence consumers' store choice decisions, based on the consideration set theory. Most studies that involve the consideration set theory deal with brand choice situations (e.g., Nordfalt et al. 2004; Roberts and Lattin 1991). In this paper, however, we apply the consideration set theory to a different context, which is a store choice setting. By using the consideration set theory in explaining store choice behavior, we enrich the theoretical base of the store choice literature.

This article also contributes to the literature since it shows that lead products affect consumers' store choice. Past studies on store choice have focused mostly on store attributes or store characteristics to explain and predict store choice behavior. However, few studies have focused on the notion that some products that consumers plan to buy can influence store choice decisions. This study fills this gap in the literature of store choice. The core premise of this

study is that lead products can influence store choice behavior, and the empirical analysis found evidence for the premise, using data collected from a survey. Although the empirical analysis showed that lead products are not as strong as the traditionally valued store choice factors, lead products complement those store choice factors and help explain more variations of store choice behavior. Thus, we argue that lead products should be considered as a significant factor for store choice, along with other store choice factors, in the store choice research.

We can draw several managerial implications from this study. One implication is that store managers can manage consumers' store choice behavior by nurturing lead categories. Traditionally, store managers have used low prices, broad selections, high product quality, high quality service and various types of advertisements to attract consumers to their stores, which is generally consistent with recommendations from other studies on store choice. This study, however, suggests a new, different way of influencing consumers' store choice decisions – that is, leveraging lead categories. Since this study found empirical evidence that some product categories can influence store choice behavior, store managers need to check if they have lead categories in their stores, and if so, which product categories are their lead categories. If they have lead categories, store managers need to strengthen those lead categories by utilizing various retail mix variables effectively. This effort will create better images for the lead categories, and consumers will be more influenced by the improved images of the lead categories. In case there is no significant lead category, store managers need to select a few product categories that have competitive advantage compared to their competitors and develop these product categories into lead categories for their stores using retail mix variables strategically.

Another implication is that lead categories enable store managers to engage in more effective category management at the store level. Category management involves "strategically

managing a retailer's or a supplier's business that recognizes categories as strategic business units for the purpose of planning and achieving sales and profit goals" (Harris and McPartland 1993, p. 5). With category management, store managers treat and evaluate each category as a separate business unit and allocate scarce resources strategically to each category to achieve company or store goals.

A key process in category management is to define a strategic role for each category (Dhar, Hoch, and Kumar 2001). A category can play a role of a traffic builder, cash generator, transaction builder, or price or variety image creator (Harris and McPartland 1993). Lead categories can help store managers determine which category is a traffic builder. Since consumers are drawn to a particular store by lead categories, this makes lead categories traffic builder categories. This is important for store managers because consumers buy other products after they are drawn to the store by lead categories. In this process, store managers can see which categories benefit from lead categories. Using the four different roles of a category, it is expected that cash generator and transaction builder categories would benefit from lead categories. Depending on the relationships between the lead categories and the benefiting categories, store managers can decide which categories should be displayed closer to each other and be featured together in advertising and promotion campaigns (e.g., featuring a lead category and a cash generator category together in a radio ad). These relationships would also allow store managers to maintain the right inventory levels for the categories involved. As such, store managers can use the knowledge of lead categories for better category management at the store level, which leads to better profitability for the store or the retail chain.

The last, but not least, implication for retail managers is that they can manage store traffic more effectively in the short and long term by using loss leaders and lead categories strategically.

As part of overall promotion strategy, loss leaders are designed to increase store traffic in the short term. On the other hand, lead categories increase store traffic over the long term because they are related to stored perceptions in consumers' minds. In situations where there is no lead category for a retail store, store managers need to nurture lead categories by improving overall offerings in the lead categories. After they make significant improvements in the lead categories, store managers can lure consumers by promoting loss leaders frequently and direct those consumers to the lead categories through in-store promotions. Consumers will see the improvements and update their perceptions on the lead categories. Gradually, these categories will be established as lead categories for the store in consumers' minds and thus increase store traffic over the long term. In situations where there exist some lead categories for a retail store, store managers can promote some slow-moving items in the lead categories as loss leaders to increase store traffic in the short term. Consumers drawn by these loss leaders will buy not only the slow-moving items, but also other popular items in the lead categories located nearby. Besides the benefit of increased store traffic, this tactic will also help improve inventory turnover in the lead categories, which will lead to higher profitability (e.g., return on assets)

Limitations and Future Research

One limitation of this paper is generalizability. The data used in this paper were collected at two supermarkets in a Midwestern city. In order to ensure generalizability, more studies similar to this paper need to be conducted in the contexts of supermarkets in different geographical regions or different types of food retailers (e.g., supercenters or convenience stores). Similar findings in such studies would provide validity of the findings in this paper.

In addition to generalizing to different types of food retailers and different geographical areas, it would also enhance generalizability of the findings in this paper if studies were conducted with general merchandise retailers, such as department stores, specialty stores or category killers. Since the context used in this paper is supermarkets, some hypotheses and some findings presented in this paper are not directly applicable in general merchandise settings. Hence, some degree of modifications is necessary for the application to general merchandise retailers. For example, with some modification, the hypotheses and related findings regarding perishable categories can be applied to high-fashion items because shelf life of most high-fashion merchandise is short, and thus high-fashion merchandise tends to vary across stores in terms of selection and product quality. Studies of this nature would either extend generalizability of the findings in this paper or set boundaries where the current findings do not hold, depending on whether or not such studies are successful in replicating the findings in this paper.

Another venue for future research is to conduct a panel survey with similar questionnaires used in this paper. We utilized a cross-sectional survey in this paper because of limited resources and time that prevented us from using more complex study design, such as a panel survey. The one-shot survey provided a cross-sectional picture of lead products for the two supermarkets studied. Now that the cross-sectional aspects of lead products are investigated and understood in this paper, a panel survey would allow us to conduct follow-up studies, such as whether lead products would be stable or change over time and, if they change, to what extent the panelists are influenced by lead products on each shopping trip over time, how much this would affect profitability of each category and storewide profitability, and so forth. Such panel studies would reveal more household level information and thus provide more interesting and relevant findings for both researchers and store managers.

Table 1
List of Store Choice Factors

Store attribute	P	G	M/E	M1	E	L/G	A/G	M2	B/L1	W/T	B/L2	H/M	B/G	P/T	V	S/H
Distance/location	X	X	X	X	X	X	X	X		X	X	X		X		X
Low prices	X	X	X	X	X	X	X	X		X		X		X		X
Assortment	X	X	X	X	X	X	X	X		X				X		X
Product quality	X					X	X	X		X		X				X
Parking facilities		X				X		X				X		X		X
Store service	X			X			X			X						X
Staff friendliness				X		X				X		X				
Promotion/discounts												X		X	X	X
Checkout speed						X				X		X		X		
Feature advertising									X		X					
Store loyalty									X						X	
Cash service						X						X				
Business hours		X				X										
Respondent's age										X						
Age of household head													X			
Household income													X			
Family size													X			
Employment status													X			
Home ownership													X			
Number of stores shopped													X			
Number of shopping trips											X					
Basket attractiveness											X					
Gas station												X				

Table 1
List of Store Choice Factor (continued)

Store attribute	P	G	M/E	M1	E	L/G	A/G	M2	B/L1	W/T	B/L2	H/M	B/G	P/T	V	S/H
Store atmosphere												X				
Bakery department						X										
Deli department						X										
In-store restaurant/café												X				
Lack of crowds		X														
Long-range products															X	
Media advertising															X	
Store cleanliness										X						
Baby facilities												X				
Physical facilities				X												
Help with packing												X				
Taste samples																X
Transportation by store												X				
Width of aisles						X										

Note: P (1980) = Pessemier (1980)
G (1981) = Gautschi (1981)
M/E (1982) = Meyer and Eagle (1982)
M1 (1983) = Malhotra (1983)
E (1984) = Eagle (1984)
L/G (1987) = Louviere and Gaeth (1987)
A/G (1989) = Ahn and Ghosh (1989)
M2 (1990) = Moore (1990)
B/L1 (1992) = Bucklin and Lattin (1992)
W/T (1992) = Woodside and Trappey (1992)
B/L2 (1998) = Bell and Lattin (1998)
H/M (1998) = Hutcheson and Moutinho (1998)
B/G (1999) = Bawa and Ghosh (1999)
P/T (2001) = Popkowski Leszczyc and Timmermans (2001)
V (201) = Volle (2001)
S/H (2003) = Solgaard and Hansen (2003)

Table 2
Classification of Supercategories by Perishability and Purchase Frequency*

	Frequently purchased categories	Infrequently purchased categories
Perishable categories	Dairy Frozen food Meat/seafood Produce	Bakery Deli Floral
Non-perishable categories	Grocery	General merchandise Health & beauty Liquor

* The supercategories used in this paper are dairy, frozen food, meat/seafood, produce, bakery, deli, floral, grocery, general merchandise, health & beauty, and liquor (Chen et al. 1999). This classification is based on the sales and unit movement data in The Marsh Super Study (Progressive Grocer 1992).

Table 3
Comparison of Stores on Key Variables

Variable		Store A	Store B	Total
Shopping list type	PSL†	40.7%	40.7%	40.7%
	No PSL	59.3%	59.3%	59.3%
% of no-PSL respondents who made a MSL‡		90.6%	81.5%	85.5%
Average no. of items on PSL		15.4	14	14.5
Average no. of items on MSL		8.2	6.8	7.5
Average no. of items on all shopping lists		11.5	11.1	11.3
Average no. of items on sales receipts		23.2	19.4	21.1
Average sales amount		$46.02	$53.62	$50.15
Average no. of shopping trips (per month)		9.0	9.9	9.51
Average no. of stores patronized		3.4	3.2	3.3

†: Physical shopping list
‡: Mental shopping list

Table 4
Proportions and *z* Values of Supercategories for H1

Supercategory	Proportion	*z* value
Dairy	0.906	59.798
Frozen food	0.895	56.235
Meat/seafood	0.949	83.087
Produce	0.962	96.913
Bakery	0.876	51.195
Deli	0.908	60.511
Floral	0.658	26.717
Grocery	0.965	101.139
General merchandise	0.876	51.195
Health & beauty	0.871	50.050
liquor	0.668	27.322

Table 5
Variables in the Unrestricted and Restricted Models

Variable	Description
Y	Dependent variable: store choice (Store A vs. Store B)
dr	Dummy variable for ***dairy*** as lead product
ff	Dummy variable for ***frozen food*** as lead product
ms	Dummy variable for ***meat/seafood*** as lead product
pd	Dummy variable for ***produce*** as lead product
bk	Dummy variable for ***bakery*** as lead product
dl	Dummy variable for ***deli*** as lead product
fl	Dummy variable for ***floral*** as lead product
gc	Dummy variable for ***grocery*** as lead product
gm	Dummy variable for ***general merchandise*** as lead product
hb	Dummy variable for ***health and beauty*** as lead product
lq	Dummy variable for ***liquor*** as lead product
distance	Distance to the store
quality	Overall product quality
price	Overall prices
assortment	Overall product assortments
hhmember	Number of household members
sex	Gender
hhincome	Household income

Table 6
Logit Estimates of Regression with All Supercategories

Dependent variable: store choice (0 if Store B; 1 if Store A)					
Independent variable	B	S.E.	Wald	Sig.	Exp(B)
lead (dr)	-.225	.573	.154	.694	.798
lead (ff)	.722	.757	.910	.340	2.058
lead (ms)	-.847	.522	2.631	.105	.429
lead (pd)	.299	.480	.390	.533	1.349
lead (bk)	.750	.615	1.485	.223	2.117
lead (dl)	-.101	.599	.028	.867	.904
lead (fl)	-1.142	3.054	.140	.709	.319
lead (gc)	.815	.497	2.694	.101	2.259
lead (gm)	-.966	1.286	.565	.452	.380
lead (hb)	.085	.950	.008	.929	1.088
lead (lq)	-2.306	1.191	3.751	.053	.100
time advantage for Store A (weighted)	.284	.061	21.734	.000	1.328
Overall product quality (weighted)	-.850	.193	19.452	.000	.428
Overall price level (weighted)	2.589	.440	34.667	.000	13.314
Overall assortments (weighted)	-.699	.236	8.764	.003	.497
Number of household members	.344	.132	6.813	.009	1.411
Sex	-.442	.387	1.303	.254	.643
Household income	.000	.000	.487	.485	1.000
Constant	-1.330	.504	6.964	.008	.264
Number of observation: 325 Percent correctly predicted: 84.6% -2(log-likelihood value): 222.635 Cox & Snell R square: .495 Nagelkerke R square: .664					

Table 7
Supercategory Variables in Binary Logit Regressions

Variable	Variable description
lead (dr)	Dummy variable for dairy as lead product
lead (ff)	Dummy variable for frozen food as lead product
lead (ms)	Dummy variable for meat/seafood as lead product
lead (pd)	Dummy variable for produce as lead product
lead (bk)	Dummy variable for bakery as lead product
lead (dl)	Dummy variable for deli as lead product
lead (fl)	Dummy variable for floral as lead product
lead (gc)	Dummy variable for grocery as lead product
lead (gm)	Dummy variable for general merchandise as lead product
lead (hb)	Dummy variable for health and beauty as lead product
lead (lq)	Dummy variable for liquor as lead product
time advantage for Store A (weighted)	Relative time advantage to go to Store A, multiplied by a dummy for distance as a store choice factor
Overall product quality (weighted)	Overall product quality, multiplied by a dummy for overall product quality as a store choice factor
Overall price level (weighted)	Overall price level, multiplied by a dummy for overall price level as a store choice factor
Overall assortments (weighted)	Overall assortments, multiplied by a dummy for overall assortments as a store choice factor

Table 8
Logit Estimates of the Restricted Model

Dependent variable: store choice (0 if Store B; 1 if Store A)					
Independent variable	B	S.E.	Wald	Sig.	Exp(B)
time advantage for Store A (weighted)	.280	.058	23.474	.000	1.324
Overall product quality (weighted)	-.837	.167	25.106	.000	.433
Overall price level (weighted)	2.180	.355	37.816	.000	8.848
Overall assortments (weighted)	-.532	.213	6.257	.012	.588
Number of household members	.270	.123	4.817	.028	1.310
Sex	-.331	.365	.820	.365	.718
Household income	.000	.000	.255	.614	1.000
Constant	-1.091	.468	5.424	.020	.336
Number of observation: 325 Percent correctly predicted: 84.3% -2(log-likelihood value): 239.924 Cox & Snell R square: .468 Nagelkerke R square: .627					

Table 9
Marginal Effects of Select Supercategories

	Meat/seafood*	Grocery*	Liquor*
Female	-17.8%	20.1%	-33.9%
Male	-14.5%	19.2%	-26.0%

* Calculated at the following values: the other supercategories = 0, time advantage for Store A (weighted) = 1.318, overall product quality (weighted) = 1.03, overall price level (weighted) = 0.3, overall assortments (weighted) = 0.54, number of household members = 3, household income = $70,000, and constant = 1.

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