

Online and In-store Customers: Comparing Loyalty and Execution

Andrea McGee
Ph.D. Candidate – Supply Chain Management
Eli Broad Graduate School of Management
Michigan State University
East Lansing, MI 48824-1122
Phone: (517) 353-6381
Fax: (517) 432-1112
Email: mcgee@bus.msu.edu

Kenneth K. Boyer
Associate Professor of Operations Management
Eli Broad Graduate School of Management
Michigan State University
East Lansing, MI 48824-1122
Phone: (517) 353-6381
Fax: (517) 432-1112
Email: boyerk@msu.edu

September 14, 2004

Online and In-store Customers: Comparing Loyalty and Execution

ABSTRACT

The advent of online grocery ordering with home delivery or customer pick-up has introduced another option for consumers that may impact their perceptions of the service encounter. We present results from a survey of 271 traditional in-store customers and 1,720 online ordering for home delivery customers of three grocers that provide both options to their customers. This allows for a comparison of customer perceptions between customer groups. The results of the study indicate that online shoppers have a higher level of satisfaction with their service encounters and a lower level of satisfaction on the tangible aspects of product quality, the range of products available and the sacrifices they make when using the grocer they have selected. Interestingly, the higher level of service satisfaction is the primary predictor of online customer behavioral intentions to continue using the grocery provider in the future. Finally, online shoppers spending a larger portion of their grocery dollars with their primary grocer than traditional in-store customers do.

This research was conducted with Grant SES 0216839 from the National Science Foundation. We appreciate the cooperation and assistance of the three participating grocers.

INTRODUCTION

Everyone has to buy groceries regularly, yet it is a chore that many people may not look forward to doing, or may have difficulty performing due to physical or transportation limitations. Today the predominant method for consumers to get groceries is to physically go to the store, walk up and down the aisles gathering what is needed and head for the checkout line. The advent of online grocery ordering has introduced another option for consumers that will eliminate the need to push a cart through the store, and if home delivery is being used, eliminates the trip to the store as well. Given the high cost of recruiting a new online customer compared to the gross profit margin per order, it is imperative that grocers providing online customer ordering have an understanding of the operational dimensions that drive customer satisfaction so that customers who try the online service will continue to use it in the future and that they will spend more using this channel. This study surveys customers from three grocers who provide both online services as well as selling through traditional brick and mortar stores. Our objective is to determine how online and in-store customers differ in their perceptions of the operational dimensions of service quality, product quality, product range, and the sacrifices made in doing business with a given grocer. Research on a firm's service quality should take into account its operational capabilities and market conduct (Roth and Jackson, 1995). In addition, we examine the relationship of these operational characteristics to behavioral intentions, specifically to the percentage of their grocery 'wallet' that they spend with their primary grocer.

The grocery industry operates in an environment that is especially challenging with exceptionally low profit margins of 1-2% (Morganosky, 1997), an average of over 30,000+ SKUs per retail outlet (Ring and Tigert, 2001) and intense competition that requires dynamic price matching. Therefore grocers are under extreme pressure to capture more market share, especially of those customers who will be loyal to a single grocer. This is particularly true for

grocers who offer online ordering where the cost of \$50-200 to acquire a new online customer is high relative to the low gross margins of approximately \$10 per purchase (Tanskanen, Yrjola, and Holmstrom, 2002). Online grocers need to capture customers and then keep them satisfied so that they will continue to use the service for a long enough period of time to allow grocers to recoup their customer recruitment costs.

The Internet is increasingly becoming a medium that is utilized by service organizations who are seeking a high level of quality in their customer facing operations while also trying to increase efficiency and cost effectiveness (Boyer, Hallowell, and Roth, 2002; Boyer and Olson, 2002; Hill, Collier, Froehle, Goodale, Metters, and Verma, 2002; Froehle and Roth, 2004). If a retailer is able to truly understand the needs and priorities of its customers, which includes how and why customers use the online ordering channel for home delivery or customer pick-up, it is possible for the firm to properly leverage its assets to ensure efficient operations and the 'right' kind of customer experience (Kunkel, 2003). Ultimately, the ability of the online retailer to fulfill customer needs will affect the amount of their shopping dollars or 'wallet' that consumers will choose to spend with a given supplier (Wolfenbarger and Gilly, 2001).

A customer's online buying experience consists of not only the Internet experience of searching for information and placing the order, but also of the delivery and customer service aspects of the transaction. However, the majority of academic research up to this point has focused primarily on the customer's interface with the website (Wolfenbarger and Gilly, 2003). Measurement of service quality delivery through websites is in its early stages, and no comprehensive scales have yet been developed (Zeithaml, 2002). There is further need for research in service operations management in general because of its growing economic impact which is especially true due to technological changes such as the Internet (Roth and Menor, 2003). The primary purpose of this research paper is to examine the operational issues for in-

store and online customers that contribute to customer satisfaction. In addition, the behavioral intentions of customers to continue to use their grocer of choice as well as the percent of the customer's grocery wallet that a grocer receives from customers is examined.

LITERATURE REVIEW AND HYPOTHESES

This section reviews existing literature on the grocery industry in general and the Internet ordering of groceries, for home delivery or customer pick-up, in particular. We examine three primary aspects of this service: the selection criteria customers use in choosing a grocer, operational dimensions that effect customer loyalty including three different aspects of quality (service, product, and range), and the degree to which customers feel they make sacrifices to continue shopping with a particular grocer. We then examine the behavioral intentions of customers to continue to purchase from their preferred grocer, along with a percentage of their grocery wallet that is spent with that grocer. We develop research hypotheses to be tested for each of these three areas with the general relationships depicted visually in Figure 1. Each of the constructs will be comparison tested for the two methods of service: traditional in-store grocery shopping compared to online ordering of groceries.

INSERT FIGURE 1 ABOUT HERE

Summary of the Grocery Industry

The grocery industry is primarily a service provider that enables consumers to gather a large variety of foodstuffs and other tangibles from a single retail location. The mixed nature of the process requires studying not only the traditional service dimensions as described by Parasuraman, Zeithaml and Berry (1985) but also customer perceptions as they relate to the tangible aspects of product quality and the range of products offered, as well as the possible

sacrifices the customer makes in choosing to do business with a particular grocery provider.

There are numerous factors that affect customer choice of stores for buying groceries, but the classic definition of strategy suggests that the two fundamental methods companies can use to capture customers are offering a low price or differentiating their product (Porter, 1980).

Several strategic models have emerged to try to capture market share in the grocery industry, but by far the prevailing strategy has been low prices. One approach to achieving low prices is through warehouse clubs, such as Price/Costco, that compete by offering prices that can be up to 26% lower than conventional supermarkets (Food Marketing Institute, 1992).

Customers of these stores often sacrifice convenience and service in exchange for lower prices (Morganosky, 1997; Consumer Reports, 2000). Another alternative for consumers is the 'superstore' represented by Wal-Mart, Kmart, and Target, that combine grocery stores with large full-line discount stores and represent one of the fastest growing formats in the US market (Humphries, 1995). However, for customers who already do not enjoy trips through the store to get the goods they want, bigger is not always a better alternative (Consumer Reports, 2000). A third alternative is to pursue a differentiation strategy via home delivery or customer pick-up of groceries. While this option is not new (think of the 1950's 'mom and pop' grocery store with a teenage boy on a bicycle making deliveries) the model has undergone substantial changes associated with the availability of a host of new technologies. With the advent of e-commerce in the late 1990's, grocers sought to take advantage of a new technology that allowed for easy ordering of groceries for residential customers via the web, resulting in a resurgence of grocery home delivery. Although there have been several much publicized failures of home delivery grocery providers, the industry as a whole continues to grow as evidenced by a study conducted by Forrester Research, Inc. which predicts that sales on the web for food/beverages will total

\$3.7 billion in 2003, up 40% from 2002 (Wingfield, 2003) and that current sales volumes are at least 50% higher than during their 'peak' in 2000 (Boyer, Hult, and Frohlich, 2003).

Internet grocery sales represent an especially challenging form of e-commerce (Baker, 2000; Palmer, Kallio, Saarinen, Tinnila, Tuunainen, and van Heck, 2000), for several reasons:

1) groceries are tangibles that prevent the entire business transaction from occurring electronically; 2) groceries are perishable so customers frequently wish to examine and select the products themselves, especially items such as meat or produce; and 3) because of the tangible and perishable nature of the goods, the grocery supplier will most often be local, which may limit market size. However, despite these substantial barriers, there is a strong appeal for online ordering and home delivery of groceries. Because grocery shopping is perceived by many to be an unpleasant, inconvenient or physically challenging chore, it provides the opportunity for grocers to create customer value by providing customers with greater convenience (Lee, 2003).

Selection Criteria

One primary benefit of online grocery shopping is the ability to avoid entering the physical store. A recent study of US consumers who purchase groceries online reported that over 70% of respondents cited convenience and timesavings as the primary reason for online buying. Other reasons were physical constraints to in-store shopping, hatred of grocery shopping and grocery stores, and a dislike of standing in line (Morganosky and Cude, 2000; Weir, 2001). Another recent study supports the dramatic timesavings possible with online grocery shopping as compared to the time spent on traditional in-store shopping. Traditional in-store shopping takes an average of 48-58 minutes per trip, with 57% of the total trip time spent on travel to and from the store, and an average customer making several trips per week (Tanskanen et al., 2002). The

ability to avoid the trip to the store could provide substantial timesavings to customers who may already feel time constrained.

Although a typical physical grocery store offers customers 30,000+ different items, only about 200 items account for 90% of a typical consumer's repetitive 'grocery list' (Tanskanen et al., 2002). Yet, each time a shopper goes to the grocery store they must physically travel throughout the store to gather each item, needing to choose from an available selection of thousands of items to get the relatively few items they actually need. In contrast, online shopping allows customers to create a grocery list that allows for a 'one click' selection of the items they frequently purchase, or even an automatic delivery schedule (Consumer Reports, 2000; Lee, 2003). In a recent survey, 31% of the respondents indicated that they want to be able to create a list of frequently purchased items (Bubny, 2000). Since many customers have little spare time and don't enjoy pushing a cart up and down aisles (Weir, 2001; Lee, 2003), time savings and convenience are a significant advantage of online over in-store shopping.

In general online shoppers can be categorized as being goal-oriented and are more focused on a quick and distraction free transaction than on the shopping experience. (Wolfenbarger and Gilly, 2001; Zeithaml, Parasuraman, and Malhotra, 2002). A recent study by Pricewaterhouse found that 42% of current online grocery shoppers were 'always looking for ways to spend less time grocery shopping', although only 11% would be willing to pay more for the service (Bubny, 2000), which fits the general model that time-starved consumers are especially likely to be online shoppers (Wolfenbarger and Gilly, 2001).

Price can play a larger role in customer perceptions of value than product quality (Varki and Colgate, 2001) allowing businesses with the highest levels of customer perceived service quality to obtain higher prices from their customers (Gale, 1992). Online customers are willing to pay a premium, which can be as high as 10-20%, for home delivery over the prices relative to

the lowest priced grocers in the area. These higher prices could also be in addition to delivery fees charged (Consumer Reports, 2000; Ring and Tigert, 2001; Lee, 2003). Finally, Zeithaml, Parasuraman, et al. (2002) suggest that service quality delivery through the Internet can be more important to customers than low price. Given the goal-orientation of online shoppers who often are willing to pay a premium for the service, we will test the following two-part hypothesis regarding the role of price and convenience for in-store versus online grocery shopping:

H1A: The importance of *price* in selecting a grocer will be greater for in-store customers than it will be for online customers

H1B: The importance of *convenience* in selecting a grocer will be greater for online customers than it will be for in-store customers

Service Quality

Service quality has long been considered an essential component of almost any service business and service quality has been shown to be a strong predictor of customer perceptions and loyalty (Woodside, Frey, and Daly, 1989; Boulding, Kalra, Staelin, and Zeithaml, 1993; Zeithaml, Berry, and Parasuraman, 1996; Cronin, Brady, and Hult, 2000; Metters, King-Metters, and Pullman, 2002). The arena of grocery shopping provides an interesting test of the importance of service quality. Whereas, fifty years ago grocers generally knew their customers by name and provided highly personalized service (Terbeek, 1999; Palmer et al., 2000), the prevailing trend over the past five decades has been the de-personalization and super-sizing of stores, as exemplified by Wal-Mart. However, if companies want to encourage repeat purchases and to build customer loyalty, they need to shift their focus for e-business from a transaction focus to a service focus (all the cues and encounters that occur before, during, and after the transaction) (Zeithaml et al., 2002).

Grocery shopping in the U.S. in 2004 generally entails little interaction of customers with employees of the grocery provider, which would normally occur only at checkout. With the recent introduction of self-serve checkout, even this service encounter can be eliminated so that an individual could very easily shop without ever speaking with a grocery employee - further depersonalizing the experience. Most consumers use the Web for its shopping facilitations and do not expect the personal interaction and warmth that they expect from traditional service firms (Zeithaml, 2002). In fact, when consumers interact with retailers, they may perceive that they are interacting with the organization as a whole through the technical interface of the Website, rather than with the employees of the organization (Wolfenbarger and Gilly, 2003). It would intuitively seem that customers who place orders online would also have little interaction with grocery employees upon which to base perceptions of service quality, however, the nature of the encounters tend to be more intimate given the delivery method, which is often directly to the customer's front door or may be when the customer goes to the store to pick up the order and the grocery employee helps to load them into the customer's car. We posit that home delivery grocers can manage this "moment of truth" carefully (Gadrey and Gallouj, 1998; Peters, 1999) to create a more personalized interaction with customers that differentiates their service from the large box stores typical of major chains. Thus we test the following hypothesis:

H2: Perceptions of *service quality* will be greater for online than for in-store customers.

Product Quality

The very nature of groceries makes them as much of a tangible as a service, which introduces the additional element of product quality, and could change the importance and nature of service quality to overall customer satisfaction (Boulding et al., 1993; Meuter, Ostrom,

Roundtree, and Bitner, 2000). For many individuals, it can be difficult to forego the ability to ‘try’ and select the product for themselves. This is especially true for items which are rather personal and which consumers use subjective criteria to select. For example, is the ‘perfect’ banana green because they won’t be eaten for a few days or all yellow because it is needed for dessert tonight or starting to get brown spots because the customer is making banana bread? In fact, for consumers who are not interested in online grocery shopping, the most frequently given reason, from 75% of the respondents, was the lack of the ability to see and touch what they were purchasing (Bubny, 2000). The varying subjective nature of perceptions of product quality between individuals, or even when individuals make selections based upon specific but changing uses, makes this a difficult issue for online grocery providers to overcome (Tanskanen et al., 2002; Ellis, 2003). Thus, we test the following hypothesis:

H3: Perceptions of *product quality* for product received will be lower for online than for in-store customers.

Range Quality

Most businesses in general, but the grocery industry in particular, continually grapple with the issue of product range. Offering more variety generally provides customers with more choice, but also makes inventory, replenishment and stocking more difficult. The trade-off between offering more choices and keeping supply chains simple and focused is a classic feature of much of the operations strategy literature (Skinner, 1969; Fisher, 1997). This issue has been particularly challenging for the grocery industry where a typical supermarket stocks a large number of SKUs but a very small selection of products account for the majority of customers routine purchases. The vast variety offered by supermarkets comes with inevitable problems with stock-outs, over ordering, obsolescence, etc. Studies have found consistent problems with

stock-outs, with 39% of customers unable to find at least one item they are searching for on a typical shopping trip (Emmelhainz, Stock, and Emmelhainz, 1991). Managing stock-out levels will increasingly become a source of competitive advantage because product availability offered by competing retailers is not equivalent: for example, Wal-Mart has put tremendous pressure on suppliers to replenish stores and thereby offer customers better service than its competitors (Zinn and Liu, 2001). Thus, the trade-off between range and stock-outs is a critical component for grocery retailers (Zinn and Liu, 2001; Stassen and Waller, 2002).

The offering of groceries with online ordering, but physical selection (and possible substitution) of the product conducted by the grocery employee, can be expected to alter the dynamics of this trade-off. Online grocers face a substantial challenge with out-of-stock items and substitutions since the customer has given up control of selecting their groceries and is more likely to blame the grocer for any deficiencies (when an online order is placed and an item is out of stock, the retailer can skip that item or substitute an alternative item, either alternative is less than perfect for the customer). One way to simplify and better manage out-of-stocks and substitutions that result from out of stocks is to offer a smaller range of items – an approach that several online grocers have taken. However the risk is that customers may perceive the range to be less attractive and not be aware of a compensating improvement in availability. Thus, we test for differences in range quality between in-store and online customers:

H4: Perceptions of *product range quality* will be lower for online than for in-store customers.

Customer Sacrifice

From the customer's standpoint, the key issue is the total cost of the shopping process, which includes time, travel, and product prices (Palmer et al., 2000). Customers who shop online for groceries are often doing so for the convenience of saving time or avoiding a physical

trip into the store, often paying a higher price in exchange for the convenience. It is therefore important to understand what, and how much, customers are willing to sacrifice with regard to price, time and effort in choosing to use a specific grocer. Several researchers have examined the relationship between perceived sacrifice and customer behavioral intentions (Parasuraman, Zeithaml, and Berry, 1985; Hart, Heskett, and Sasser, 1990; Dodds, Monroe, and Grewal, 1991). Thus, the final hypothesis of operational dimensions to be tested will be:

H5: Perceptions of *customer sacrifice* will be lower for online than for in-store customers.

Outcomes

The end goal of any business is to make money and we would like to predict the behavioral intentions of customers in terms of those who label themselves as 'loyal', their intentions to continue to use the grocer in the future, and the percentage of their grocery budget that is spent with the specific grocer. The grocery business is extremely competitive and customers have become less loyal over the past decade. Retaining customers and getting them to do a greater proportion of their shopping with a given grocer or store can have a huge impact on profits. Given that typical net profit margins are in the 1-2% range and that gross margins are in the 30% range, increasing the number of customers shopping with a specific grocer by even a small amount can have a large impact on profits. Thus, we examine customer behavioral intentions as our primary measure of outcomes.

Literature from social sciences gives us two well-known and empirically supported theories that can be used to ground the importance of customers' perceptions in influencing future behavior. Drawing upon the Theory of Planned Behavior (Ajzen, 1985; Ajzen, 1991) and the Theory of Reasoned Action (Fishbein and Azjen, 1975) we can conclude that a person's feelings about a service provider (their 'satisfaction') can drive intentions for future behavior, such as

loyalty to the service provider (Froehle and Roth, 2004). The impact of product and service quality on behavioral intentions at the individual customer level has been a focus of research for some time and there is general acceptance that there is a strong link between customers' behavioral intentions and service quality (Woodside et al., 1989; Boulding et al., 1993; Zeithaml et al., 1996; Cronin et al., 2000). It is intuitively reasonable to expect that customers who perceive they receive higher service quality would also be more loyal to the service provider.

In the highly competitive grocery business, creating customer loyalty is key (Lee, 2003). Widely available groceries that are largely commodity items has created a market with extreme competition and a primary emphasis on price (Morganosky, 1997). Customer loyalty would appear to be even more critical for online grocers where customer acquisition is expensive. Furthermore, it has been found that online customers may need to place several orders to learn the ordering process well enough to experience significant time savings and to have a higher level of satisfaction (Boyer and Olson, 2002). Research suggests there is a strong linkage between customer satisfaction, loyalty and purchase behavior (Rust and Zahoric, 1993; McLaughlin and Wittink, 1998). These are connected in such a way that increasing customer satisfaction creates stronger customer loyalty to the firm, which leads customers to favor purchasing from the firm (Rust, Zahoric, and Keiningham, 1995). The question for online grocery suppliers then follows: what contributes to a higher level of customer satisfaction that will drive a higher share of customer purchases? Of those who currently shop online for groceries, only 7% are able to do so from their preferred or primary grocery store, although 43% would 'strongly agree' that they would rather use their own grocery store if it provided an online service (Bubny, 2000). Finally, it is important to be able to predict customer behavior, especially financially, as it relates to loyalty. Thus, we examine the following two hypotheses:

H6A: The independent variables of service, product and range quality, and sacrifice can be used to predict customer behavioral intentions

H6B: Service, product and range quality, and sacrifice will have different weights when predicting customer behavior for in-store and online customers

METHODS

Samples

The samples consist of customers of three U.S. grocers who provide both online ordering with home delivery or customer pick-up and who also serve customers through traditional ‘bricks and mortar’ retail stores. Data was collected from both traditional store shoppers and online customers of the three grocers. Although all three firms were generous in allowing access to their customers and provided assistance throughout the survey process, they prefer not to be identified by name, and are therefore assigned the fictional names of Grocer 1, 2 and 3. Due to the competitive nature of the industry, financial information on the firms can only be discussed in aggregate. The three firms have annual combined sales of over \$40 million from online/home delivery in 6 states and traditional grocery sales of over \$50 billion from stores in 30 states. The size, geographic dispersion, and length of time the grocers’ have been serving their online markets make them good choices for the survey and allow for generalizability to the grocery industry as a whole.

INSERT TABLE 1 ABOUT HERE

Data Collection

A summary of the data collection techniques can be found in Table 2, including the number of customers contacted, the number of responses and the response rate. All customers included in the online category had purchased groceries online from the grocers in the study at least once in the previous year. These three grocers were selected because they have been

serving the in-store and online markets for some time and are large enough in both channels to provide an adequate customer base to survey.

INSERT TABLE 2 ABOUT HERE

One of the drawbacks of collecting data from direct contact with the customers of different companies is that each organization has specific requirements regarding how the customer contact should be conducted. This is especially true since all three organizations were very concerned about protecting the privacy of customer data and had a desire to avoid potential misuse of sensitive customer information, as well as a desire to protect their customers from feeling intruded upon by multiple requests for information. Thus we sought to balance the concerns and needs of the individual grocers versus the need for data collection homogeneity. Customers from all groups were asked identical core questions that are used as the basis of this study, although we did allow individual grocers to ask some additional questions that were of specific interest or that related to a unique service they provided to their customers. There were minor differences in five of the basic data collection methods across grocers: sample selection, invitation to customers, incentive offered, survey method, and follow-up invitation.

Collection of in-store only customer data was conducted in person over the course of several hours spent in the stores and asking randomly selected customers to participate in the survey in an opt-in process, until approximately 80-100 responses were collected for each grocer using a method similar to Wakefield and Baker (1998). Only in-store customers who had not placed online orders are included in this sample.

Online customers with a range of experience with online grocery ordering (as determined by the number of orders placed) for Grocer 1 and 2 were sent e-mails and asked to complete the web-based survey. Grocer 3 posted a message on the order checkout web page inviting

customers to participate in the web-based survey using an opt-in approach as the customer was concluding their grocery order. This resulted in a convenience opt-in sample of customers of Grocer 3, however a question was added to the survey for this grocer asking customers to indicate the number of online orders they had placed so that it was possible post-hoc to ensure that the sample included an adequate number of individuals from an appropriate range of experience levels. Having customers across a range of experience levels was necessary to reduce potential sources of bias. The high number of customers contacted for Grocer 3 represents the total number of customers who logged on to the web site during the two-week period. Basic guidelines were used for survey research and data collection including customer contact with follow-up reminders as needed, a token incentive for survey completion and a promise of anonymity (Dillman, 1978).

Grocers 1 and 2 considered it important to compensate their online customers for their time and effort in providing this important feedback. The incentives offered by the grocers varied slightly, but were valued at less than \$10 per customer. Grocer 3 did not provide an incentive to their customers for participation in the survey. The immediate 'on the spot' opt-in process for the in-store customers negated the need for follow-up letters, as did the open invitation posted on Grocer 3's web site. However, both Grocer 1 and 2 did utilize follow-up invitations.

As shown in Table 2, the overall response rate for online customers who received a direct invitation (Grocers 1 and 2) is quite high with 869 responses from the 3,237 customers contacted, or 26.9%. Grocer 3 has a low response rate of only 8.6% due to the opt-in request to the survey rather than a special invitation, lack of incentive and no follow-up process. Overall the response results compare favorably to similar studies (Duray, Ward, Milligan, and Berry, 2000; Papke-Shields, Malhotra, and Grover, 2002).

Differing data collection methods (e-mail invitations, in-person opt-in, and electronic opt-in) could result in potential sample bias. Several tests for bias across the groups suggested that bias did not exist, which is consistent with research that indicates that surveys can be administered using a variety of media to contact the customers with little cause for concern as long as the research design is solid and the questionnaire used is consistent across sample groups (Couper, 2000b; Couper, 2000a; Klassen and Jacobs, 2001).

Scales

Academic research on scales to be used to assess customer perceptions for online ordering are just beginning to emerge, although (at the time these surveys were conducted) no comprehensive scale had been published to capture the dimensions and attributes in a rigorous and psychometrically sound way (Zeithaml, 2002). Figure 1 provides details on the customized scales that were used to capture the unique aspects of online grocery purchases and delivery. Individual items included in each scale are summarized in the results on Tables 3 and 4. All final scales are calculated from the means of the individual items included in a given scale. Two individual questions regarding the customer's rating of the importance of the price of products and of convenience when selecting a grocery provider were asked directly and not included in any other scale.

Measurement of *service quality* has been the subject of study and debate for the past two decades (Parasuraman et al., 1985; Cronin and Taylor, 1992; Teas, 1994; Llosa, Chandon, and Orsingher, 1998; Clerfeuille and Poubanne, 2003), although study of this area of service through Websites is in its early stages (Zeithaml, 2002). The goal is to better understand the gap between customer expectations and customer experiences in order to close the gap to create more customer loyalty (Zeithaml et al., 1996; Mitchell and Kiral, 1998). A ten-question scale based

upon the original ten dimensions of service quality proposed by Parasuraman, et al (1985) was created to capture customer perceptions of tangibles, reliability, responsiveness, assurance and empathy. The intention was to ask a broad range of questions while also keeping the total number of questions asked to a manageable level. Similar scales have been used in other studies (Kettinger et al., 1995).

Because of the very tangible nature of the grocery items being delivered, several of the issues to be addressed in this study are not specifically contained in the 22 item SERVQUAL measurements originally devised by Parasuraman, Zeithaml and Berry (1985), therefore customized scales had to be created to assess product quality and range quality. Product quality and the range of products offered was of special interest to the grocery managers that were interviewed and were cited as a key challenge for the companies to execute well on from an operational perspective. Other research has found that product quality and product range is also an issue for online customers (Bubny, 2000; Consumer Reports, 2000; Wolfinbarger and Gilly, 2003).

The *product quality* scale was created specifically to compare customer perceptions of differences between in-store and online product quality. This scale measures customer perceptions as they relate to the physical quality of the products they receive. *Range quality* is the second customized scale that deals with the inventory issues of the range of products being unavailable as requested and the number of substitutions that are made. This is an especially important issue for online shoppers who may not know that a product is temporarily unavailable when they place their order, and must rely on the grocer to select a substitution to fill the order without customer knowledge or input (Tanskanen et al., 2002). Customers who in-store shop have immediate feedback of a stock out via an empty shelf and the ability to examine the available alternatives to select their 'best fit' substitution. The final operational dimension of

sacrifice measures customer perceptions of the tradeoffs made in using a specific grocer and is adapted from the research of Dodds, Monroe, and Grewal (1991) and Zeithaml (1988).

The indicators of behavioral intentions represent the outcome measures in this study. Zeithaml, Berry, and Parasuraman (1996) suggest that positive behavioral intentions are reflected in the service provider's ability to get its customers to: (a & b) remain loyal to them, (c) pay price premiums and (d) communicate concerns to the company.

As shown in Table 3, all of the scales used in this study easily meet the 0.70 threshold recommended for base inter-item reliability ((Nunnally, 1978; Flynn, Sakakibara, Schoeder, Bates, and Flynn, 1990). Factor analyses of the scales indicated that the items loaded on the proper constructs and that each of the constructs was uni-dimensional. Finally, extensive pre-testing with executives of the participating grocery firms indicated a high degree of face validity for the scales.

RESULTS

Selection Criteria

As shown in Table 3, there are very clear differences in why customers choose specific grocers. Convenience is much more important to online customers than price; in contrast, in-store customers place much more importance on price. It is interesting to note given the prevailing coverage in the media of the price pressure placed on most grocers, that neither customer group rates price as the MOST important reason in selecting a grocer. Perhaps this is because price is seen as more of an order qualifier than an order winner. Regardless, the data in Table 3 clearly support hypotheses 1A and 1B.

INSERT TABLE 3 ABOUT HERE

Operational Dimensions

Hypotheses 2-5 examine the potential for differences in customer perceptions of quality (service, product and range) and sacrifice based on the service method. As shown in Table 3, there are significant differences for all four constructs when examining the overall scales. While the scales provide an aggregate measure that will be used later when predicting behavioral intentions, it is interesting to examine the specific items within each scale.

As we argued earlier, online customers generally rate service quality higher than in-store customers. The scale mean is significantly higher ($p < 0.01$) for online customers, as are the individual means for 7 out of 10 of the scale items. The only individual items that do have significant differences are SQ4, SQ7 and SQ10. Items of particular interest include SQ3 (employees are responsive), SQ5 (I feel secure in service encounters), SQ6 (employees are courteous) and SQ9 (Grocer_X has good credibility). Each of these items has a significantly higher mean for online than for in-store customers. This indicates that online grocers are managing the “moment of truth” at the customer’s car or front door by being responsive, nonthreatening (secure), courteous, and generally establishing good credibility. This is essential for making this business model work since customers are initially wary of this new method of grocery shopping. The data provide support for hypothesis 2 and suggest that online grocers are using this service as a way to increase the service quality for customers.

The mean for the Product Quality scale is substantially higher for in-store customers than for online customers and is significant at the $p < 0.01$ level, with all three of the individual items significantly higher for in-store customers. This is intriguing since the product quality should be essentially the same since the products are often picked from the same retail store customers would shop in, then delivered to their homes or made available for pick-up for online customers. Two possible explanations come to mind. First, as noted earlier, one of the disadvantages of

online ordering is that the customer sacrifices the ability to select their own products. This is not a big problem for packaged goods (i.e. cereal, canned soup, cookies etc.) because these items are commodity goods that are protected by their packages and have a high degree of consistency. However, produce, meats, fruits and dairy products are much more variable and customers may be concerned about giving up the ability to select their own goods according to their preferences for ripeness, color, expiration date, etc. The second possible explanation relates to customer perceptions of item PQ2 (assortment of products). At least one of the grocers in our sample offers a more limited range of items to online customers than it does to in-store customers. This is done to simplify operations in terms of inventory tracking, order picking and website maintenance, but clearly this can have negative consequences with customers. Although a more limited range of products may prevent stock-outs (and therefore unplanned substitutions), customers may not perceive this benefit and instead may be focused on the reduced range of products from which they can make their initial selections. In summary, there is clear support for hypothesis H3 – in-store customers perceive product quality as substantially higher than online customers.

In-store customers also perceive Range Quality to be higher than do online customers – both for the overall scale and for each of the individual items. While we cannot definitively state why this is so, we can offer a plausible explanation. Online customers are not physically in the store, so they may not be able to find products as easily as their in-store counterparts or may not realize the extent of their choice. Furthermore, as noted above, at least one of the grocers offers a truncated range of products to online customers. With regard to substitutions and out of stock items, online customers give up control of their purchases and selection options (including possible substitutions) once they submit their order. Often, an online customer does not know that a particular product is unavailable until the substitution selected by the grocery employee is

delivered or picked up. If an in-store customer is faced with an item that is out of stock, they may simply substitute an alternative item (either another size of the same product or an alternative brand). The online customer must delegate this choice to the store employee who is picking their order, which means that at best the choice is the same, at worst they are unhappy with the choice and do not find out until their order is delivered or picked up the next day. Thus, there is strong support for hypothesis 4: in-store customers have higher perceptions of product range than online customers.

In-store customers rate all elements of Sacrifice higher than online customers. This indicates that they are generally more satisfied with Grocer_X than on-line customers – they believe that prices are low and the time and effort needed to purchase is low. Given the anticipated trade off between price and convenience, it is not unexpected that online customers have a low mean score of 4.76 (out of a possible 7) on the question ‘Grocer-X prices are low’, which is in fact the lowest score on any of the questions within the operational dimension scales. What is unexpected is that online customers also have statistically lower mean scores on the remaining two questions in this scale that ask about the time and effort required to make a purchase. The primary purpose of placing orders online is to save the time and effort required to go to the physical store, go up and down aisles to retrieve the desired products and stand in line waiting to be checked out; yet it appears that online customers do not perceive that they are experiencing a lower investment of time or effort from placing their grocery orders online. In short, there is strong support for hypothesis 5: online customers are making larger sacrifices than in-store customers.

Outcomes

While the operational dimensions are clearly important, the most important thing is tangible results. We turn now to an examination of customer loyalty and intentions. As shown in Table 4, there is no significant difference for Behavioral Intentions – in-store and online customers provide nearly identical ratings, however, there are two differences for individual items. In-store customers rate item BI3 (I would continue to do business ... even if I had to pay more) significantly higher than online customers. This is interesting since online shopping is very convenience oriented and customers rate price as less important. Thus we would expect online customers to be willing to pay a premium for the service. The mean rating for online customers of 3.99 is nearly identical to the 4.0 midpoint (neutral) for the response range from 1 = strongly disagree to 7 = strongly agree on this item. This suggests that the grocers have the home delivery service well priced for customers who are not upset that the prices are too high, but who are not willing to pay more for the service either. In contrast, the online customers say that they are more likely to complain to employees if they experience a problem (BI4). This may be because they feel a strong personal connection with the employee who delivers their order.

INSERT TABLE 4 ABOUT HERE

In contrast to behavioral intentions, there is a significant difference for the question regarding the percentage of grocery shopping done with Grocer_X. Online customers report they do more of their shopping (81.43%) than in-store customers (76.26%) with the specific grocer. This is a very significant finding since it implies a type of halo effect; online customers may like the service and increase the percentage of all their grocery shopping they do with a particular grocer. This is important since it is hard to envision a future where customers do all their grocery shopping online; it is unlikely that customers can plan perfectly, so there will

always be a need to ‘pop into the store’ for unplanned or emergency purchases. The value of this type of increased purchasing is substantial. Consider a “typical” store with annual sales of \$20 million and a return on sales of 1%, for a total net profit of \$200,000. What is a 1% increase in business worth? Given that the gross margin on groceries is typically about 30% and that this store has already covered its fixed costs of labor, utilities, equipment etc., the 1% increase in sales nets out to a \$200,000 ($\$20 \text{ million} * 1\%$) increase in sales, but potential increase in net profit of \$60,000 ($30\% \text{ gross margin} * \$200,000 \text{ increase in sales}$). Thus, a 1% increase in sales at a particular store results in a 30% increase in profits. Clearly, increasing the proportion of grocery shopping for an individual (81.43% vs. 76.26%) has large potential benefits.

Predicting Behavioral Intentions

The final hypotheses (H6A and B) tested were the ability of the independent variables of Service, Product and Range Quality, and Sacrifice to predict Behavioral Intentions. Table 5 shows the results of 6 regression equations: the in-store, online and combined samples and the independent variables with Behavioral Intentions and with Percentage Shopping (PS1) as dependent variables. We forced all four of the independent variables into each equation to keep the models similar and allow comparisons of coefficients.

INSERT TABLE 5 ABOUT HERE

All six of the regression equations predict a significant amount of the variance in the dependent variables. Table 5A shows equations that predict between 35% and 36% of the variance in Behavioral Intentions for both online and in-store customers. Thus, the three types of quality and the perceived willingness to sacrifice are excellent predictors of customer behavioral intentions. A comparison between customer types reveals some interesting differences. All four

independent variables are significant for online customers while only Product Quality and Sacrifice are significant for in-store customers. Range Quality and Service Quality are not good predictors of Behavioral Intentions for in-store customers. This makes intuitive sense since range quality (product variety and in-stock availability) is largely a given for most in-store customers, they assume products will be available unless the store makes an error, and if products are out of stock they simply choose the most agreeable alternative available. For service quality, customers have been trained to not expect much interaction with employees, so they do not expect it. In contrast, online customers do value Range Quality and Service Quality. Given the newness of online ordering of groceries and the disintermediating effect, the ability of the grocer to deliver high Range Quality (i.e. product variety and few substitutions or stock-outs) is very important to providing a seamless and convenient experience. Similarly, Service Quality (coefficient = 0.31 for online vs. 0.11 for in-store) is likely of more impact because the customers value the ‘moment of truth’ when the grocery employee delivers their groceries. In contrast, in-store customers place much higher emphasis on product quality (coefficient = 0.27 for in-store vs. 0.12 online).

Table 5B shows regression equations using percent of business (PS1) as the dependent variable. All three equations (in-store, online and combined) predict a significant amount of variance (R^2 values range from 0.07 to 0.10), but the total is somewhat less than that for Behavioral Intentions. This is not surprising given that the percentage of grocery shopping done with a particular grocer can be influenced by a large variety of factors outside the grocer’s direct control. Regardless, the independent variables are good predictors of PS1 and the coefficients follow similar patterns to those seen for Behavioral Intentions. Service Quality is more important to online customers (coefficient = 3.56 for online vs. 1.99 for in-store), while Product

Quality is more important for in-store customers (coefficient = 2.23 for online vs. 6.96 for in-store). Thus, we conclude that the results support hypotheses 6A and 6B.

DISCUSSION AND FUTURE RESEARCH

This study presents the first direct comparison of two different operating modes for grocery shopping: traditional stores and online ordering with home delivery or customer pick-up. In examining customer perceptions regarding operational aspects and their intentions to continue using the service/grocer, several interesting findings emerge.

The advent of an alternative method of grocery shopping via online ordering with home delivery or customer pick-up allows for multiple strategies within the grocery industry. Over the past 50 years, grocers have increasingly refined their operations to relentlessly focus on low prices. While this approach has benefited customers tremendously, it has also reached a point of diminishing, or non-existent, marginal returns. The difference between any two grocers in the same community on prices for identical items is typically minimal. Prices have been pushed down to the level where it is difficult, if not impossible, to develop a sustainable competitive advantage in this area. The media is filled with headlines about companies such as Kroger, Farmer Jack, Safeway or K-mart who are struggling or flirting with bankruptcy due to an inability to match prices profitably with top competitors. In short, the operating frontier (Schmenner and Swink, 1998) in groceries has been reduced to a primary emphasis on low price and many of the competitors simply cannot reach that frontier. In contrast, home delivered groceries offer an opportunity for grocers to quit pursuing market leaders from an inferior position off the operating frontier, and to switch to a niche strategy emphasizing convenience rather than price (Porter, 1980) and to compete on a different operating frontier.

The data shown in Table 3 shows that online customers place a large premium on convenience relative to in-store customers, while price is substantially less important. In strategic terms, online grocers have communicated their competitive priorities/order winners clearly (Hayes and Wheelwright, 1984; Hill, 1994). Following the accepted model of operations strategy, the next question would be whether the alternative methods of providing groceries can support these priorities with clear operational decisions. As shown in Table 3, customers of online grocers clearly perceive a substantially higher level of service quality (questions SQ1 – SQ10). Customers view all aspects of service quality as better handled with home deliveries or customer pick-up than with traditional in-store shopping. In contrast, in-store customers rate both product and range quality higher, and have higher ratings for sacrifice. In short, the operating results are mixed: online appears to provide better service quality while in-store shopping provides better product and range quality.

The end goal of most businesses is to retain customers and make profits. As shown in Table 4, online grocers receive comparable ratings for customer behavioral intentions, and actually capture a higher percentage of overall grocery purchases. Despite the challenges of refining a new operating model, the data suggest that home delivery grocers are able to develop a high degree of customer loyalty. There is good potential for improvements with respect to product and range quality that may allow home delivery grocers to capture a wider customer base. The regression results shown in Table 5 show that the operational dimensions of quality and sacrifice are good predictors of customer intentions for both operating models. In addition, the coefficients of service, product and range quality differ between online and in-store grocers. The data clearly support that service and range quality are of greater importance to online than in-store customers. In contrast, product quality is a stronger indicator for in-store than for online customers.

The data from this study illustrate two primary things. First, online ordering allows grocers to change the strategic focus of their operations in a way that is supportable through operations and allows online grocers to develop comparable levels of customer loyalty. This is important in that it supports the idea of equifinality – that there is more than one strategic approach within an industry that is capable of capturing and retaining customers (Porter, 1980). This is particularly important in the grocery industry, where relentless competition and a few leading players control large portions of the market, and smaller grocers are seeking ways to differentiate themselves. Second, the regression results provide insight into the operational areas that online grocers must improve on. Based on the findings in this study, there is a strong need for further research in several areas.

We have examined a single approach to providing online ordering of groceries and in-store picking of orders, but there is another approach that involves centralized distribution centers. Preliminary research in this area suggests that centralized DCs may be able to provide better product and range quality relative to in-store picking (Boyer and Hult, 2004). Based on the results of the current study, online grocers that find a way to improve both the product and range quality while maintaining service quality have the potential to substantially increase customer retention and profitability. A second major area for further research involves more direct study of the picking, assembly and delivery methods of online grocers. When picking orders from an existing store, grocers are adding to their cost since all products must first be put on shelves in the store, then picked for customers and delivered to their homes. Grocers can recoup this additional cost if their fixed costs are already covered and the additional orders via the Internet can utilize the gross margin (typically 30%) to cover the costs of picking and delivering orders. However, there is value in examining the methods used to pick and deliver orders in order to identify which methods provide the best efficiency, the best accuracy and the

most convenience for customers. Here again, there is substantial room to compare two operating methods: store-based picking and DC-based picking. We believe that there is substantial promise for home-delivered groceries to provide an alternative strategy for grocery firms that cannot compete on price alone. The challenge of meeting the desires of customers who desire more convenience should drive this industry to grow and as it tries alternative operating approaches there is an excellent opportunity to learn and compare methods.

REFERENCES

- Ajzen, I. (1985). From Intentions to Actions: A Theory of Planned Behavior. *Action-Control: From Cognition to Behavior*. J. Kuhl and J. Beckman. Heidelberg, Springer: 11-39.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes* **50**: 179-211.
- Baker, M. (2000). Online grocery shopping - time for a stock-taking. *ICSC Research Quarterly* **7**(1): 1-4.
- Boulding, W., A. Kalra, R. Staelin and V. A. Zeithaml (1993). A dynamic process model of service quality: From expectations to behavioral intentions. *Journal of Marketing Research* **30**(1): 7.
- Boyer, K. K., R. Hallowell and A. V. Roth (2002). E-services: Operating strategy - A case study and a method for analyzing operational benefits. *Journal of Operations Management* **20**(2): 175.
- Boyer, K. K. and G. T. Hult (2004). Predicting Customer Loyalty for Online Purchases: An Examination of Pick Method and Customer Experience Level. *working paper*.
- Boyer, K. K., G. T. Hult and M. Frohlich (2003). An exploratory analysis of extended grocery supply chain operations and home delivery. *Integrated Manufacturing Systems* **14**(8): 652.
- Boyer, K. K. and J. R. Olson (2002). Drivers of Internet purchasing success. *Production and Operations Management* **11**(4): 480.
- Bubny, P. (2000). Not yet clicking. *Supermarket Business* **55**(7): 65.
- Clerfeuille, F. and Y. Poubanne (2003). Differences in the contributions of elements of service to satisfaction, commitment and consumers' share of purchase: A study from the tetraclass model. *Journal of Targeting, Measurement and Analysis for Marketing* **12**(1): 66.
- Consumer Reports (2000). Food fight. *Consumer Reports* **65**(9): 11.
- Couper, M. P. (2000a). Usability evaluation of computer-assisted survey instruments. *Social Science Computer Review* **18**(4): 384.
- Couper, M. P. (2000b). Web surveys: A review of issues and approaches. *Public Opinion Quarterly* **64**(4): 464.
- Cronin, J. J., M. K. Brady and G. T. M. Hult (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing* **76**(2): 193.
- Cronin, J. J., Jr. and S. A. Taylor (1992). Measuring Service Quality: A Reexamination and Extension. *Journal of Marketing* **56**(3): 55.
- Dillman, D. A. (1978). *Mail and Telephone Surveys: The Total Design Method*. New York, NY, Wiley.
- Dodds, W. B., K. B. Monroe and D. Grewal (1991). Effects of Price, Brand, and Store Information on Buyers' Product Evaluations. *JMR, Journal of Marketing Research* **28**(3): 307.
- Duray, R., P. T. Ward, G. W. Milligan and W. L. Berry (2000). Approaches to mass customization: Configurations and empirical validation. *Journal of Operations Management* **18**(6): 605.
- Ellis, C. (2003). Lessons from online groceries. *MIT Sloan Management Review* **44**(2): 8.
- Emmelhainz, M. A., J. R. Stock and L. W. Emmelhainz (1991). Consumer Responses to Retail Stock-Outs. *Journal of Retailing* **67**(2): 138.
- Fishbein, M. and I. Ajzen (1975). *Beleif, Attitude, Intention and Behavior: An Introduction to Theory and Research*. Reading, MA, Addison-Wesley.

- Fisher, M. L. (1997). What is the right supply chain for your product? *Harvard Business Review* **75**(2): 105.
- Flynn, B. B., S. Sakakibara, R. G. Schoeder, K. A. Bates and E. J. Flynn (1990). Empirical Research Methods in Operations Management. *Journal of Operations Management* **9**(2): 250-284.
- Food Marketing Institute (1992). *Alternative Store Formats: Competing in the Nineties*. Washington D.C., Food Marketing Institute.
- Froehle, C. M. and A. V. Roth (2004). New measurement scales for evaluating perceptions of the technology-mediated customer service experience. *Journal of Operations Management* **22**(1): 1.
- Gadrey, J. and F. Gallouj (1998). The provider-customer interface in business and professional services. *The Service Industries Journal* **18**(2): 1.
- Gale, B. (1992). *Monitoring Customer Satisfaction and Market-Perceived Quality. American Marketing Association Worth Repeating Series*. Chicago: American Marketing Association.
- Hart, C. W. L., J. L. Heskett and W. E. Sasser, Jr. (1990). The Profitable Art of Service Recovery. *Harvard Business Review* **68**(4): 148.
- Hayes, R. H. and S. C. Wheelwright (1984). *Restoring Our Competitive Edge: Competing Through Manufacturing*. New York, Wiley.
- Hill, A. V., D. A. Collier, C. M. Froehle, J. C. Goodale, R. D. Metters and R. Verma (2002). Research opportunities in service process design. *Journal of Operations Management* **20**(2): 189.
- Hill, T. J. (1994). *Manufacturing Strategy: Text and Cases*. Burr Ridge, Irwin.
- Humphries, G. (1995). Prospects for Food Discounters and Warehouse Clubs. London, Pearson Professional Ltd.: 78-82.
- Kettinger, W. J., C. C. Lee and S. Lee (1995). Global measures of information service quality: A cross-national study. *Decision Sciences* **26**(5): 569.
- Klassen, R. D. and J. Jacobs (2001). Experimental comparison of Web, electronic and mail survey technologies in operations management. *Journal of Operations Management* **19**(6): 713.
- Kunkel, J. (2003). Reducing risk, maximizing return in online retailing. *Chain Store Age* **79**(9): S3.
- Lee, L. (2003). Online grocers: Finally delivering the lettuce. Brick-and-mortar chains are finding profits in cyberspace. *Business Week*(3830): 67.
- Llosa, S., J.-L. Chandon and C. Orsingher (1998). An empirical study of SERVQUAL's dimensionality. *The Service Industries Journal* **18**(2): 16.
- McLaughlin, E. W. and D. R. Wittink (1998). A model of consumer perceptions and store loyalty intentions for a supermarket retailer. *Journal of Retailing* **74**(2): 223-245.
- Metters, R. D., K. H. King-Metters and M. Pullman (2002). *Successful Service Operations Management*, South-Western College.
- Meuter, M. L., A. L. Ostrom, R. I. Roundtree and M. J. Bitner (2000). Self-service technologies: Understanding customer satisfaction with technology-based service encounters. *Journal of Marketing* **64**(3): 50.
- Mitchell, V. W. and R. H. Kiral (1998). Primary and secondary store-loyal customer perceptions of grocery retailers. *British Food Journal* **100**(7): 312.
- Morganosky, M. A. (1997). Format change in US grocery retailing. *International Journal of Retail & Distribution Management* **25**(6): 211.

- Morganosky, M. A. and B. J. Cude (2000). Consumer response to online grocery shopping. *International Journal of Retail & Distribution Management* **28**(1): 17-26.
- Nunnally, J. C. (1978). *Psychometric Theory*, McGraw-Hill Book Company.
- Palmer, J. W., K. Kallio, T. Saarinen, M. Tinnila, V. K. Tuunainen and E. van Heck (2000). *Online grocery shopping around the world: Examples of key business models*. Association of Information Systems. Retrieved July 10, 2004. <http://cais.aisnet.org>,
- Papke-Shields, K. E., M. K. Malhotra and V. Grover (2002). Strategic manufacturing planning systems and their linkage to planning system success. *Decision Sciences* **33**(1): 1.
- Parasuraman, A., V. A. Zeithaml and L. L. Berry (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing* **49**(4): 41.
- Peters, V. J. (1999). Total service quality management. *Managing Service Quality* **9**(1): 6.
- Porter, M. (1980). *Competitive Strategy*. New York, The Free Press.
- Ring, L. J. and D. J. Tigert (2001). Viewpoint: The decline and fall of Internet grocery retailers. *International Journal of Retail & Distribution Management* **29**(6/7): 266.
- Roth, A. V. and W. E. I. Jackson (1995). Strategic determinants of service quality and performance: Evidence from the banking industry. *Management Science* **41**(11): 1720.
- Roth, A. V. and L. J. Menor (2003). Insights into Service Operations Management: A Research Agenda. *Production and Operations Management* **12**(2): 145.
- Rust, R., A. Zahoric and T. Keiningham (1995). Return on quality (ROQ): Making service quality financially accountable. *Journal of Marketing* **59**(4): 58-70.
- Rust, R. T. and A. J. Zahoric (1993). Customer satisfaction, customer retention, and market share. *Journal of Retailing* **69**(2): 193-215.
- Schmenner, R. W. and M. L. Swink (1998). On theory in operations management. *Journal of Operations Management* **17**(1): 97.
- Skinner, W. (1969). Manufacturing: missing link in corporate strategy. *Harvard Business Review* **47**(3): 136-145.
- Stassen, R. E. and M. A. Waller (2002). Logistics and assortment depth in the retail supply chain: Evidence from grocery categories. *Journal of Business Logistics* **23**(1): 125.
- Tanskanen, K., H. Yrjola and J. Holmstrom (2002). The way to profitable Internet grocery retailing - six lessons learned. *International Journal of Retail & Distribution Management* **30**(4): 169.
- Teas, R. K. (1994). Expectations as a comparison standard in measuring service quality: An assessment of a reassessment. *Journal of Marketing* **58**(1): 132.
- Terbeek, G. A. (1999). *Agency Agenda: Selling Food in a Frictionless Marketplace*, Breakaway Strategies, Inc.
- Varki, S. and M. Colgate (2001). The role of price perceptions in an integrated model of behavioral intentions. *Journal of Service Research* **3**(3): 232.
- Wakefield, K. L. and J. Baker (1998). Excitement at the mall: Determinants and effects on shopping response. *Journal of Retailing* **74**(4): 515.
- Weir, T. (2001). Staying stuck on the Web. *Supermarket Business* **56**(2): 15.
- Wingfield, N. (2003). Online Grocery Shopping is picking up Speed as Shoppers' Fears Ease. St. Louis Today.
- Wolfenbarger, M. and M. C. Gilly (2001). Shopping online for freedom, control, and fun. *California Management Review* **43**(2): 34.
- Wolfenbarger, M. and M. C. Gilly (2003). eTailQ: Dimensionalizing, measuring and predicting eetail quality. *Journal of Retailing* **79**(3): 183.
- Woodside, A. G., L. L. Frey and R. T. Daly (1989). Linking Service Quality, Customer Satisfaction, And Behavior. *Journal of Health Care Marketing* **9**(4): 5.

Zeithaml, V. A. (2002). Service excellence in electronic channels. *Managing Service Quality* **12**(3): 135.

Zeithaml, V. A., L. L. Berry and A. Parasuraman (1996). The behavioral consequences of service quality. *Journal of Marketing* **60**(2): 31.

Zeithaml, V. A., A. Parasuraman and A. Malhotra (2002). Service quality delivery through Web sites: A critical review of extant knowledge. *Academy of Marketing Science. Journal* **30**(4): 362.

Zinn, W. and P. C. Liu (2001). Consumer response to retail stockouts. *Journal of Business Logistics* **22**(1): 49.

Figure 1: Research Model

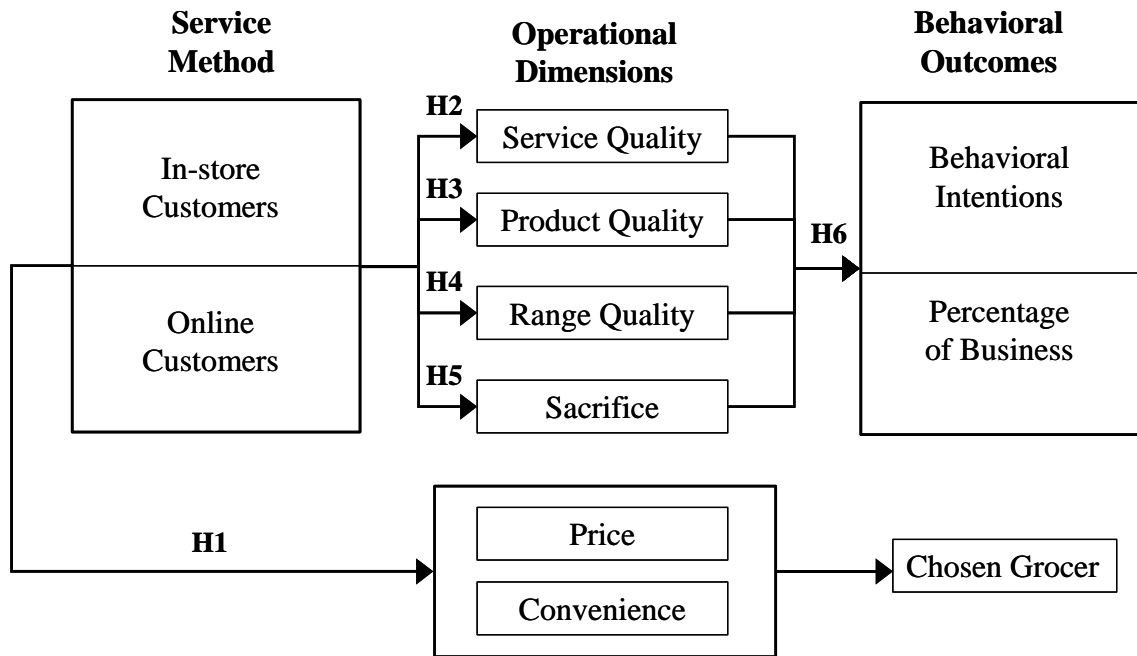


Table 1. Description of Participating Companies

	Grocer 1	Grocer 2	Grocer 3
Location	5 states in the southeastern U.S.	1 state in the southeastern U.S.	27 states, mostly in the western U.S.
Annual Sales	\$15+ billion	Unavailable	\$20+ billion
Traditional Stores	800	100	1,550
Home Delivery Markets	1	31 stores	6

Table 2. Description of Data Collection Methods

	Grocer 1		Grocer 2		Grocer 3	
Customer Type	In-store	Online	In-store	Online	In-store	Online
Sample Selection	Random	Stratified	Random	Stratified	Random	Random
Invitation to customer	in-person Opt-in	e-mail Invitation	in-person Opt-in	e-mail Invitation	in-person Opt-in	Website Opt-in
Incentive	No	Yes	No	Yes	No	No
Survey Method	Written	Web	Written	Web	Written	Web
Customers contacted	NA	2,078	NA	1,159	NA	10,418
Responses	101	475	108	394	80	896
Response Rate	NA	22.9%	NA	34%	NA	8.6%

Table 3: T-test of Operational Dimensions

	Customer Type		p
	In-Store n=271	Online n=1720	
Selection Criteria			
<i>Price of products</i> is important in selecting Grocer_X	5.92 (1.34)	5.10 (1.59)	**
<i>Convenience</i> is important in selecting Grocer_X	6.13 (1.34)	6.73 (0.68)	**
Service quality (scale mean)	6.00 (0.94)	6.19 (0.91)	**
	Cronbach's Alpha	0.95	0.96
SQ1. Grocer_X employees are reliable in providing the service I expect	5.97 (1.12)	6.14 (1.09)	*
SQ2. Grocer_X employees are understanding of my service needs	5.87 (1.09)	6.05 (1.12)	*
SQ3. Grocer_X employees are responsive to my service requests	5.96 (1.12)	6.12 (1.15)	*
SQ4. Grocer_X employees are competent in providing the expected service	6.02 (1.10)	6.09 (1.13)	
SQ5. I feel secure in service encounters with Grocer_X employees	6.09 (1.03)	6.28 (1.02)	**
SQ6. Grocer_X employees are courteous in providing me service	6.20 (1.04)	6.51 (0.93)	**
SQ7. Grocer_X employees are available to answer my service-related questions	5.95 (1.12)	6.04 (1.25)	
SQ8. The tangible (appearance of trucks, staff, products) aspects of Grocer_X' service are excellent	6.02 (1.13)	6.29 (1.04)	**
SQ9. Grocer_X has good credibility in providing the service I need	6.08 (1.01)	6.28 (1.04)	**
SQ10. I have access to communicate with Grocer_X regarding my service needs	5.96 (1.15)	6.10 (1.25)	
Product quality (scale mean)	5.84 (1.04)	5.46 (1.13)	**
	Cronbach's Alpha	0.87	0.86
PQ1. Grocer_X has prestigious products	5.84 (1.09)	5.57 (1.24)	**
PQ2. Grocer_X has an excellent assortment of products	5.97 (1.06)	5.40 (1.32)	**
PQ3. Grocer_X products are among the best	5.76 (1.17)	5.43 (1.24)	**
Range quality (scale mean)	5.77 (1.03)	5.12 (1.36)	**
	Inter-item Correlation	0.53**	0.42**
RQ1. Grocer_X has a sufficient range of product choices (I can get what I want)	5.87 (1.08)	5.05 (1.54)	**
RQ2. The number of substitutions or out of stock items is reasonable	5.67 (1.23)	5.18 (1.57)	**
Sacrifice (scale mean)	5.63 (1.16)	5.20 (1.21)	**
	Cronbach's Alpha	0.79	0.79
S1. Grocer_X' prices are low on the products that Grocer_X offers	5.45 (1.34)	4.76 (1.39)	**
S2. The time needed to make a purchase from Grocer_X is low	5.66 (1.35)	5.30 (1.51)	**
S3. The effort required to make a purchase from Grocer_X is low	5.78 (1.26)	5.34 (1.44)	**

Notes:

- All Items rated on a Likert scale ranging from 1 = strongly disagree to 7 = strongly agree
- Mean (Std Dev), items in **bold** are significantly higher
- The individual grocer's name was inserted wherever Grocer_X appears
- * p < 0.05 ** p < 0.01

Table 4: T-test of Behavioral Intentions

	Customer Type		p
	In-Store n=271	Online n=1270	
Behavioral intentions (scale mean)	5.46 (1.14)	5.47 (1.01)	
Cronbach's Alpha	0.64	0.70	
BI1. I would classify myself as a loyal customer of Grocer_X	5.97 (1.25)	6.05 (1.23)	
BI2. I do not expect to switch to another (online) grocer to get better service in the future	5.72 (1.43)	5.90 (1.48)	
BI3. I would continue to do business with Grocer_X even if I had to pay more	4.37 (1.93)	3.99 (1.80)	**
BI4. I would complain to Grocer_X employees if I experienced a problem with their service	5.73 (1.40)	5.96 (1.28)	**
Percent of business			
PS1. What percent of your grocery shopping do you do with Grocer_X?	76.26 (26.28)	81.43 (23.40)	**

Notes:

- All Items rated on a Likert scale ranging from 1 = strongly disagree to 7 = strongly agree
- Mean (Std Dev), items in **bold** are significantly higher
- The individual grocer's name was inserted wherever Grocer_X appears
- * p < 0.05 ** p < 0.01

Table 5: Predicting Customer Intentions

A) Behavioral Intentions as Dependent Variable

	Combined	Online	In-store
Constant	1.36**	1.38**	1.42**
Service quality	0.31**	0.31**	0.11
Product quality	0.12**	0.12**	0.27**
Range quality	0.08**	0.09**	-0.04
Sacrifice	0.21**	0.21**	0.36**
R ²	0.35**	0.36**	0.35**
	n=1937	n=1720	n=271

B) Percent of Business as Dependent Variable

	Combined	Online	In-store
Constant	37.74**	39.57**	23.44*
Service quality	3.97**	3.56**	1.99
Product quality	2.39**	2.23**	6.96*
Range quality	-0.69	-0.44	-0.38
Sacrifice	1.68**	1.94**	0.36
R ²	0.07**	0.07**	0.10**
	n=1550	n=1333	n=271

NOTE:

- * p < 0.05
- ** p < 0.01