An Exploratory Analysis of Familiarity and Willingness to Use Online Food Shopping Services in a Local Area of Texas

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Online food shopping is not only one of the newest innovations in grocery shopping but also one of the many services integrating the changing needs of consumers and the increasing use of modern technology. A survey was conducted in the Bryan/College Station area of Texas to determine a quantitative profile of consumers, via logit analysis, who are familiar with the concept of online food shopping and who are willing to use an online food shopping service. Older people, females, major shoppers, and people with lower incomes are less likely to be familiar with the concept of online food shopping. Those consumers willing to consider using online food shopping services are those familiar with the concept of online food shopping, those who find convenience as the largest benefit, and those who are chiefly concerned about price, credit card security, and delivery service. Older people and those with no college education are less likely to use online food shopping services.

Introduction

Revolutionary changes are not uncommon to the grocery industry. Technology has been a primary force for the majority of these changes. With the increasing popularity and use of computers in our society, it is only logical to consider the use of modern technology in grocery shopping. Technology—such as electronic data interchange (EDI), Efficient Consumer Response (ECR), and point-of-sale scanner data—provides specific details about who buys what, where, and when. Yet it is also important to understand the food-shopping behavior of consumers. Online food shopping is one aspect of grocery shopping that has not been fully explored in academic research. Jean Kinsey, director of the Retail Food Industry Center at the University of Minnesota, said that industry experts predict Internet shopping will reach 10 percent of food sales in 10 years (Kinsey, 1998).

Online food shopping is a relatively new phenomenon, one of the many means by which to better serve customers. It is gaining acceptance and exposure in many areas. Understanding this evolution is of paramount importance when analyzing the food shopping practices of consumers. For example, the Consumer Direct Cooperative

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(CDC), comprised of diverse companies and grocery stores with an interest in identifying changes within the packaged-goods industry, defines consumer direct as a "full service channel that helps consumers simplify their lives by providing groceries and related products without going to a land-based store, usually aided by a personal computer or other automated ordering system" (Orler and Friedman, 1998). Obviously, online food shopping is a part of this emerging industry. The primary factor enabling the success of the consumer direct industry is the widespread use of computers. Today, at least 18 percent of Americans have access to the Internet (Orler and Friedman, 1998). Every week, 80 million Americans use a personal computer, and nearly 10 million purchases have been made using the Web to date (Orler and Friedman, 1998). These statistics and their growth potential demonstrate that consumers are technology-oriented and that grocery retailers must satisfy their needs. The availability of current technology to satisfy the needs of consumers provides the next logical outlet for retailers. It is projected that 15–20 million households will be using consumer direct by 2007, with sales estimated at $85 billion (Orler and Friedman, 1998).

Objectives

Online food shopping has been a "service of the future" for the past three to four years. Several firms, such as Peapod and NetGrocer, are now making it a reality to thousands of consumers. Yet, to be able to better serve the consumer, the industry

should have an idea of those consumers most likely to use the service. The CDC labels six potential consumer segments: (1) *shopping avoiders*—those people who simply dislike going to the grocery store, so they will consider anything to avoid the shopping experience; (2) *necessity users*—those who are limited in their ability to go to the store; (3) *new technologists*—young consumers very familiar with technology; (4) *time-starved consumers*—those who are willing to pay for services that will give them more time for other activities; (5) *responsible consumers*—those who feel it is their job to do a good job in grocery shopping; and (6) *traditional shoppers*—those who enjoy grocery shopping and avoid technology (Orler and Friedman, 1998). All but the traditional shoppers seem to be candidates for online food shopping. These categories provide a framework for retailers to find the type of consumers who use their services.

The objectives of this paper are twofold: (1) to quantitatively develop a profile of people familiar with the concept of online food shopping and (2) to quantitatively develop a profile of people likely to use online food shopping services. No quantitative analyses about online food shopping have been reported in the existing literature. This research, consequently, fills this void.

Methodology

To develop the aforementioned profiles of consumers as outlined in the objectives, a survey instrument (see Appendix) was developed based in part on a study of grocery shopping habits in the 1970s by Kaitz (1979).

The survey respondents were asked to determine the category that best fits their typical shopping behavior. Some of the questions addressed in this context were the following: Does the respondent compare prices; make a food list; buy extra items at a lower price; check food ads; check food labels; plan menus; go to more than one store; and act as major shopper? The respondent also is asked a question regarding the duration and frequency of his/her shopping trip.

The online food shopping questions are a natural complement to the grocery shopping habit questions. A necessary tool to participate in online food shopping is access to a computer equipped with the Internet. Consequently, a question addressed whether or not the respondent had a computer with this access. Further, the consumer was asked to de-

scribe the frequency of his/her use of the Internet as either daily, weekly, monthly, or never. The respondent also was asked about his/her familiarity with the concept of online food shopping.

The survey in this research project was conducted in early June 1998. Four grocery stores in Bryan/College Station, Texas, were selected based on location. Two stores were in a predominantly middle income area; one was in a high income area; and one was in a lower income area. Customers were greeted at the door of each store and invited to complete the short questionnaire, which took only 3–5 minutes.

Currently, there is not an online food shopping service in the Bryan/College Station area. Therefore, this study only provides results based on the *willingness* of respondents to use online food shopping services.

To gather more information about online food shopping, the respondent was asked to rank from one (the most important) to five (the least important) consideration regarding price, delivery service, credit card security, quality and selection of the products, and convenience. The respondent was also asked to choose, among these factors, the one that was of greatest concern when considering the use of online food shopping services.

The intercept format used in conducting the survey resulted in approximately 100 respondents per store. A time frame of two hours, to spend in the store intercepting customers, was agreed upon with the manager of each store. About 390 surveys were completed in the time frame allotted.

The sample demographics can be compared with the demographics from the Bryan/College Station area in the 1990 census. Differences indeed are likely given the differences in time frames, 1990 versus 1998. Statistics from the 1990 census indicate that females are approximately 48 percent of the population, white people are approximately 66 percent of the population, people age 55 and above are 13 percent of the population, and the median household income is about $31,000. The demographics from our sample indicate somewhat different statistics. For example, women comprise 59 percent of the sample. It is logical that women would be the majority of a sample taken in grocery stores since women are primarily the major shoppers. Forty-eight percent of the Bryan/College Station population are 18–24 years old. The survey age category starts with those 18 to 29 years old, 33

percent of the sample. The sample of respondents appears to be better educated and more wealthy than the general Bryan/College Station community. Eighteen percent of the respondents have a high school diploma or less while about 20 percent of the people in Brazos County have less than a high school diploma. In addition, 48 percent of the sample have a bachelor's degree or higher while 25 percent of the people of Brazos County have a bachelor's degree or higher. More respondents from the survey have a family income range of $40,000 to $74,999 than do those from the census.

Model Development

The purpose of this project is to quantitatively develop a profile of consumers who are currently familiar with the concept of online food shopping and a profile of consumers who will potentially use online food shopping. This study is an exploratory effort, given the fact that survey respondents are from a local area in Texas.

The variables and their descriptions are shown in Table 1. Logit analysis is the primary method of estimation. Logit models are appropriate in the case of analyses of binary dependent variables, in this case familiar or not familiar with online food shopping and potential user or nonuser of online food shopping. The logit specifications circumvent the difficulties of the linear probability model via the use of monotonic transformation, which guarantees that predictions (that is, probabilities) lie in the unit interval ((Schmitz and Nayga, 1991; Capps and Kramer, (1985).

Model 1—Familiarity with the Concept of Online Food Shopping

This model allows us to determine the type of consumer currently familiar with the concept of online food shopping. The dependent variable is labeled as KNOW (see Table 1), a dummy variable developed from data concerning familiarity with the concept of online food shopping through the Internet. Approximately 25 percent of the respondents indicated that they are currently familiar with the concept of online food shopping services. The variables that make up this model are predominantly demographic in nature, and thus, they are predominantly dummy or indicator variables.

Four age variables are included in this model. AGE1 is the variable representing the 18- to 29-year-old category. Thirty-four percent of the respondents are in this age category. AGE2 corresponds to the age range of 30 to 39; AGE3 denotes the range of 40 to 49; and AGE456 pertains to the range of 50 and older. The respondents are evenly dispersed among the AGE2, AGE3, and AGE456 categories. It is expected that older respondents, particularly those over 50, will be less familiar with the concept of online food shopping than younger respondents will be.

Race is another consideration in the familiarity model. The variable WHITE represents the respondents who are Caucasian in the race/ethnic origin category. This category also is the base, or reference, category. Approximately 80 percent of the respondents are in the WHITE category. NWHITE represents those who chose African-American, Hispanic, Asian/Pacific Islander, or other. No a priori hypothesis regarding the influence of race on familiarity with the concept of online food shopping is made.

Respondents with more education are expected to be more familiar with the concept of online food shopping than are respondents with less education. EDU12 is the variable for people with a high school diploma or less. EDU3, EDU4, and EDU5 represent those who have at least some college education. Nineteen percent of the respondents have a high school diploma or less while, at the other end of the spectrum, 26 percent have graduate training. The base category is a combination of EDU3, EDU4, and EDU5.

Gender differences may be evident concerning the familiarity of the concept of online food shopping. Women comprise 60 percent of the sample while men, the base category, comprise the remaining 40 percent. No hypothesis regarding the effect of gender on familiarity with the concept of online food shopping is made.

Wealthier respondents are hypothesized to be more familiar with the concept of online food shopping than are less wealthy respondents. This hypothesis is based on the opportunity cost of time. Wealthier respondents have a greater opportunity cost of time than less wealthy individuals. INC1 is the variable that stands for a combined family income of less than $20,000; twenty-six percent of the respondents fall into this category. However, in this sample, college students who have access to computers through the Uni-

Table 1. Descriptive Statistics of Variables from Online Food Shopping Survey.

Name	Description of Variables	Mean	Standard Deviation	Min	Max
AGE1	1=18–29; 0=else	0.3377	0.4736	0	1
AGE2	1=30–39; 0=else	0.2111	0.4086	0	1
AGE3	1=40–49; 0=else	0.2032	0.4029	0	1
AGE456	1=50+; 0=else	0.2427	0.4293	0	1
GENDER	1=female; 0=male	0.5963	0.4913	0	1
WHITE	1=white; 0=else	0.7995	0.4010	0	1
NWHITE	1=African American, Hispanic, Asian; other; 0=else	0.2005	0.4010	0	1
EDU12	1=high school diploma or less; 0=else	0.1900	0.3928	0	1
EDU3	1=some college; 0=else	0.3245	0.4688	0	1
EDU4	1=college grad.; 0=else	0.2216	0.4159	0	1
EDU5	1=grad. training; 0=else	0.2612	0.4399	0	1
INC1	1=$0–19,999; 0=else	0.2084	0.4067	0	1
INC2	1=$20,000–39,999; 0=else	0.2322	0.4228	0	1
INC3	1=$40,000–74,999; 0=else	0.2823	0.4507	0	1
INC4	1=75,000+; 0=else	0.2137	0.4105	0	1
SIZE	number of people in the household	2.9525	1.4917	0	1
KIDS	1=children are present; 0=else	0.4908	0.5006	0	1
CS	1=reside in College Station; 0=else	0.3879	0.4879	0	1
PRICE13	1=price as the biggest benefit; 0=else	0.0844	0.2784	0	1
QUAL13	1=quality and selection of products as the biggest benefit; 0=else	0.3298	0.4707	0	1
CONV13	1=convenience as the biggest benefit; 0=else	0.1240	0.3300	0	1
PRICE14	1=price as the greatest concern; 0=else	0.2137	0.4105	0	1
CCS14	1=credit card security as the greatest concern; 0=else	0.2375	0.4261	0	1
DS14	1=delivery service as the greatest concern; 0=else	0.0712	0.2576	0	1
ADS1	1=always or almost always checks food ads; 0=else	0.2058	0.4048	0	1
ADS2	1=sometimes checks food ads; 0=else	0.2375	0.4261	0	1
ADS3	1=seldom or never checks food ads; 0=else	0.5541	0.4977	0	1

Table 1. Descriptive Statistics of Variables from Online Food Shopping Survey (continued).

Name	Description of Variables	Mean	Standard Deviation	Min	Max
STORE1	1=always or almost always goes to the same store; 0=else	0.1873	0.3907	0	1
STORE2	1=sometimes goes to the same store; 0=else	0.2559	0.4370	0	1
STORE3	1=seldom or never goes to the same store; 0=else	0.5514	0.4980	0	1
MAJOR1	1=always or almost always the major food shopper; 0=else	0.7124	0.4532	0	1
MAJOR2	1=sometimes the major food shopper; 0=else	0.1900	0.3928	0	1
MAJOR3	1=seldom or never the major food shopper; 0=else	0.0976	0.2972	0	1
SHOP12	1=shops for less than 30 minutes; 0=else	0.4143	0.4932	0	1
SHOP34	1=shops for more than 30 minutes; 0=else	0.5805	0.4941	0	1
GO1	1=goes shopping more than once/week; 0=else	0.3984	0.4902	0	1
GO2	1=goes shopping once/week; 0=else	0.3668	0.4826	0	1
GO345	1=goes shopping less than once/week; 0=else	0.2137	0.4105	0	1
COMAC	1=access to computer equipped with Internet; 0=else	0.6623	0.4736	0	1
KNOW	1=familiar with the concept of online food shopping; 0=else	0.2507	0.4340	0	1
USE	1=willing to consider the use of online food shopping; 0=else	0.3404	0.4745	0	1

versity make up a good proportion of this category. INC2 is the category of $20,000 to $40,000. INC3 is the category of $40,000 to $75,000, the base category for the income group of variables with 28 percent of the respondents. INC4 is the category of greater than $75,000.

KIDS is the variable representing those respondents who have children currently living in the household. Almost one-half of the respondents have children in the household. The base category is the absence of children in the household. Often people with children do not have the time or monetary resources to explore new innovations such as online food shopping. On the other hand, parents may have less time to shop for food, so they may be interested in using online food shopping services to save time. Consequently, no clear hypothesis is evident regarding the influence of the presence of children with the familiarity of the concept of online food shopping.

MAJOR1 represents the 71 percent of the respondents who are always or almost always the major shopper in the family. MAJOR2 and MAJOR3 denote the variables that represent people who are sometimes, seldom, or never the major shopper. The combination of the variables MAJOR2 and MAJOR3 serve as the reference category. It is hypothesized that the major shopper is likely to be more familiar with the concept of online food shopping than are others in the household.

The variable that corresponds to the people who have access to a computer equipped with the Internet is labeled COMAC. Approximately 66 percent of the respondents have this access, which is likely to be positively related to the familiarity with the concept of online food shopping. The base category corresponds to those who do not have access to a computer equipped with the Internet.

The final variable included in this model relates to the residency of the respondents. The variable CS represents people who live in College Station; the base category consists of non-College Station residents. Thirty-eight percent of the respondents are College Station residents. They are expected to be more familiar with the concept of online food shopping than are non-College Station residents because the majority of University professors and students live in this town.

*Model 2—Willingness to Use
Online Food Shopping*

The second model is designed to help determine the type of customer interested in actually using an online shopping service. The dependent variable is USE, developed from those respondents who are *willing* to consider using an online food shopping service. Thirty-four percent of the respondents indicate that they are willing to consider using these services. Since this community does not currently have an online food shopping service, the question is phrased, "Would you consider using an online food shopping service?" Thus, the premise of this model is determining the type of consumer interested in using an online food shopping service.

Many of the same variables are included from the previous model, namely age, race, income, presence of children, gender, residency, computer access, major food shopper, and education. Hypotheses regarding the willingness to use online food shopping are precisely those as previously described in the familiarity model.

The use model, however, also includes some additional variables not in the familiarity model. The number of people in a household is represented by the variable SIZE. The average household size for this sample is almost three people. The effect of this variable on willingness to use online food shopping is difficult to anticipate. Small career households might be expected to be interested in using this service to save time, but

large families might also be interested in participating in order to save time.

Familiarity with the concept of online food shopping (KNOW) is expected to have a positive impact on willingness to use the service. In essence then, familiarity is hypothesized to beget use.

The following variables are created from the questions regarding traditional grocery shopping practices. These variables provide further insight into the type of consumer willing to use online food shopping services.

The frequency of shopping trips may influence the willingness to use online food shopping services. GO1 represents the 40 percent of respondents who say that they go grocery shopping more than once a week, the base category. GO2 represents consumers who grocery shop once a week. GO345 is the variable for people who go to the grocery store less often than once a week (every other week, once a month, or other). It is hypothesized that the less often a person goes to the grocery store, the less likely they are to use an online food shopping service.

The duration of the shopping trip also might have an impact on the willingness to use an online food shopping service. SHOP12 is the variable corresponding to those respondents who spend less than 30 minutes at the grocery store. SHOP34 is the variable for those who spend more than 30 minutes per shopping trip. SHOP34 is the base category, with 58 percent of the respondents. It is expected that people who spend more time in the grocery store would be more interested in using an online food shopping service.

Two other traditional shopping behaviors might affect the willingness to use online food shopping services. If a customer checks the food ads in the newspaper before shopping, s/he might be more interested in using the service. Often ads are a large part of the online food shopping experience. This variable is called ADS1, the 20 percent of respondents who always or almost always check the food ads, and it is expected to have a positive sign on the willingness to use online food shopping services. The other variable is STORE1, representing people who always or almost always shop at the same store. Twenty percent of the respondents are in this category. This variable is tantamount to customer loyalty to that particular store, which may be an important factor in developing relationships with online food shoppers. The implications from this variable are two-fold: (1) An online food shopping firm may

need to entice the customer away from the store they usually use, or (2) the store could capitalize on the customer loyalty and provide an online food shopping service as an addition to the traditional services that it offers. A negative sign is expected for the coefficient associated with STORE1 because of the loyalty factor.

Question 13 from the survey asks the respondents to rank five benefits in order of importance, with 1 being the most important and 5 being the least important. The five factors are price, delivery service, credit card security, quality and selection of products, and convenience. Three of these benefits stood out as most important in our sample: price, quality, and convenience. PRICE13 corresponds to those respondents who chose price as the number-one benefit when considering online food shopping. QUAL13 corresponds to the respondents who chose quality and selection of products as the largest benefit. CONV13 represents the respondents who consider convenience as the chief benefit. These estimated coefficients of these three variables are expected to be positively related to the willingness of a consumer to use online food shopping services.

Question 14 asks the respondents to choose which of the five previously stated factors is the greatest concern when considering online food

shopping. PRICE14 represents those who chose price as their chief concern. CCS14 represents those who chose credit card security as their chief concern. DS14 represents those who chose delivery service as their greatest concern. It is hypothesized that these concerns are negatively related to the willingness to use online food shopping services. Alternatively, these concerns could simply be considered factors for the marketer to understand as important, with the consumer still willing to try online food shopping.

Empirical Analysis: Familiarity Model

As exhibited in Table 2, the goodness-of-fit measure for this model—the McFadden's R^2 statistic—is 0.114. The prediction success table, shown in Table 3, suggests that the model correctly predicts the choices of 234 respondents from the 379 in the sample. The cutoff point for the prediction success ratio is derived from the percentage of people from the sample who indicated that they are familiar with online food shopping, 95 out of 379. Thus, the cutoff point for the familiarity model is 25 percent instead of the traditional cutoff point of 50 percent. Therefore, if the predicted probability is greater than .25, we predict that the respondent is familiar with online food shopping.

Table 2. Empirical Results from the Familiarity Model.

Name	Estimated Coefficient	t-ratio	Change in Probability[a]
AGE2	-0.1483	-0.38	-0.03
AGE3	0.0931	0.24	0.02
AGE456	-0.6129*	-1.54	-0.12
NWHITE	-0.1235	-0.33	-0.02
EDU12	-0.0236	-0.05	-0.005
GENDER	-0.4172*	-1.54	-0.08
INC1	-0.7061*	-1.68	-0.14
INC2	-0.5319*	-1.43	-0.10
INC4	-0.05138	-0.15	-0.01
KIDS	-0.3187	-1.04	-0.06
MAJOR1	-0.4004*	-1.37	-0.08
COMAC	1.5301*	3.84	0.29
CS	0.0782	0.29	0.15
CONSTANT	-1.2137	-2.20	
McFadden's R^2	0.114		
% Right Predictions	61.7%		

[a] f(z) times the estimated coefficient, where z equals the linear combination of the estimated coefficient with the respective means of the explanatory variables. The probability density function of the logistic distribution is $f(z) = e^z/(1+e^z)^2$.

Table 3. Prediction Success Table for the Familiarity Model.

		Actual		
		0	1	
	0	160	21	
Predicted	1	<u>124</u>	<u>74</u>	<u>234</u>
		284	95	379

Conversely, if the predicted probability is less than .25, we predict that the respondent is not familiar with online food shopping. The model correctly predicts that 160 of 284 respondents are not familiar with the service (56.3 percent), and the model correctly predicts that 74 of 129 (57.4 percent) of the respondents are familiar with the service. The estimated coefficients, t-ratios, and change in probabilities for the variables in this model are also given in Table 2. A 10 percent level of significance is used in this analysis.

The only age variable with a significant t-ratio is AGE456, corresponding to people over the age of 50. This estimate indicates that individuals who are 50 years and older are less likely to be familiar with online food shopping than those 18–29 years old. Based on the change in probability column, the probability that those in the 50+ age group will be familiar with online food shopping services is lower by 12 percentage points relative to those in the 18–29 year old age group. Income is a key factor in the familiarity model. Those people with combined family incomes of less than $40,000 are less likely to be familiar with the concept of online food shopping than those with income of more than $40,000. The difference in probabilities of familiarity for these two income groups is between 10 and 14 percentage points.

Women in our sample are less likely to be familiar with online food shopping services than are men. The magnitude of the difference in probability is 8 percentage points. In addition, paradoxically the major food shopper is also 8 percentage points less likely to be familiar with the online food shopping concept. As expected, access to a computer equipped with the Internet is a significant factor in the familiarity with online food shopping. The probability of familiarity of those with access to the Internet is higher by 29 percentage points, compared to those without access. Race, education level, place of residence, and presence of children are not statistically significant factors in the familiarity model.

Empirical Analysis: Use of Online Food Shopping

The goodness-of-fit measure for the use model, as shown in Table 4, is not quite as strong as it is in the familiarity model. The McFadden's R^2 is 0.090 in the use model. The prediction success table, shown in Table 5, represents 238 right predictions out of 379. The cutoff point for the prediction success ratio is derived from the percentage of people from the sample who indicated that they would be willing to consider using online food shopping, 129 out of 379. Thus, the cutoff point for the use model is 34 percent instead of the traditional cutoff point of 50 percent. Therefore, if the predicted probability is greater than .34, we predict that the respondent is willing to consider using online food shopping.

Conversely, if the predicted probability is less than .34, we predict that the respondent is not willing to consider using online food shopping. The model correctly predicts that 152 of 250 (60.8 percent) respondents are not willing to consider using the service, and the model correctly predicts that 86 of 129 (66.6 percent) of the respondents are willing to consider using the service. The estimated coefficients, t-ratios, and change in probabilities for the variables in this model are also given in Table 4. A 10 percent level of significance is used in this analysis.

In this model, as in the familiarity model, age is inversely related to the probability of willingness to use online food shopping services. This result is an indication that people over the age of 50 are 18 percentage points less inclined to consider using the Internet to shop for food than people 18–29 years old.

Table 4. Empirical Analysis from the Willingness-to-Use Model.

Name	Estimated Coefficient	t-ratio	Change in Probability[a]
KNOW	0.5767*	2.10	0.12
AGE2	-0.1310	-0.36	-0.03
AGE3	-0.3435	-0.91	-0.07
AGE456	-0.8542*	-2.23	-0.18
NWHITE	0.2605	0.77	0.06
EDU12	-0.5640*	-1.50	-0.12
INC1	0.0203	0.05	0.004
INC2	-0.0068	-0.02	-0.001
INC4	0.3535	1.06	0.07
SIZE	-0.0522	-0.42	-0.01
KIDS	0.1504	0.41	0.03
MAJOR1	-0.7590	-0.26	-0.02
COMAC	0.2415	0.76	0.05
GENDER	-0.0110	-0.04	-0.002
GO2	0.2800	1.11	0.06
GO345	-0.3715	-1.20	0.08
SHOP12	0.0597	0.24	0.01
ADS1	-0.0228	-0.07	-0.005
STORE1	-0.2719	-0.80	-0.06
CS	-0.3504	-1.34	-0.08
PRICE13	0.3086	0.74	0.07
QUAL13	0.1080	0.43	0.02
CONV13	0.5911*	1.67	0.13
PRICE14	0.7595*	2.45	0.16
CCS14	0.5807*	1.89	0.13
DS14	0.7969*	1.74	0.17
CONSTANT	-0.9998	-1.63	
McFadden's R^2	0.09		
% Right Predictions	62.8		

[a] $f(z)$ times the estimated coefficient, where z equals the linear combination of the estimated coefficient with the respective means of the explanatory variables. The probability density function of the logistic distribution is $f(z) = e^z/(1+e^z)^2$.

Table 5. Prediction Success Table for the Willingness-to-Use Model.

		Actual		
		0	1	
	0	152	43	
Predicted	1	<u>98</u>	<u>86</u>	<u>238</u>
		250	129	379

Less educated consumers are 12 percentage points less likely to consider using online food shopping than are well-educated consumers. Those living in the town of College Station are eight percentage points less likely to use online food shopping than those living in other towns. One possible explanation is that many of the respondents were visitors to the area and did not reside in either Bryan or College Station. Previous knowledge about the concept of online food shopping proves to be a very good indicator of those interested in online food shopping. When convenience is one of the most important factors to a person considering online food shopping, they also are more likely to use the service.

If price is the chief concern for a consumer, the consumer is more likely to use online food shopping. When credit card security is a chief concern, the consumer is still willing to consider using the service. Finally, if consumers consider delivery service a noteworthy concern, they are still interested in using the Internet to shop for food. While respondents were concerned with the issues of price, credit card security, and delivery service, they were still interested in this innovation.

Income is not a significant determinant of willingness to use online food shopping services. The number of people living in the household and the presence of children also do not show any significance. Neither the gender of the major shopper nor access to a computer equipped with the Internet is significant in the willingness-to-use model. The duration of the shopping trip to the traditional grocery store does not impact the profile of those willing to use online food shopping services. Always or almost always checking the food ads in the newspaper and going to the same grocery store

for each shopping trip also are not significant in this model. Price as well as quality and selection of products are not significant in the use model.

Concluding Remarks and Possibilities for Further Research

This study is designed to develop a profile of those familiar with online food shopping and a profile of potential users of online food shopping. Generally, the results for the familiarity model indicate that the consumers with access to the computer are more likely to be familiar with the concept of online food shopping; people over 50 are less likely to be familiar than those who are 18–29; females are less likely than males; consumers who are always or almost always the major shopper are less likely than those who are not; and people with combined family incomes of less than $40,000 are less likely than those with incomes above $40,000 to be familiar with online food shopping.

The results from the use model indicate that, if (1) the consumer is familiar with the concept, (2) convenience is the largest benefit, and (3) price, credit card security, and delivery service are chief concerns, then the consumer is likely to use online food shopping. People over 50 are less likely than those 18–29 to use online food shopping, and consumers with a high school diploma or less are less likely to use the service than those with at least some college.

One caveat is in order. Due to the small sample and the limited scope of this study, care must be taken when generalizing results of this study to regional or national levels since the community-specific results may not contribute to broad regional inferences.

Although this study was conducted as an exploratory effort, the empirical results may assist in the identification of target groups inclined to use online food shopping. This information will allow food marketers to anticipate trends in online food shopping, to improve planning, and to provide better customer service.

As with any exploratory study, further research will provide additional information. One aspect that would aid in better understanding the online food shopping service industry would be a cost analysis. At this point there are many different ways to provide the service, so analyses are necessary to determine the least-cost alternative. Online food shopping seems to be one of the many services integrating the changing needs of consumers and the increasing use of modern technology. As online food shopping services flourish, more research opportunities will arise in the quest to more fully understand this frontier in food marketing.

Appendix—The Food-Shopping Survey

1. I compare prices on several food products when I go food shopping.
   O always   O almost always   O sometimes   O seldom   O never

2. Make out a food list before I go shopping.
   O always   Oalmost always   O sometimes   O seldom   O never

3. I buy extra food items when I can buy them at lower prices.
   O always   O almost always   O sometimes   O seldom   O never

4. I check food ads in the newspaper before I go food shopping.
   O always   O almost always   O sometimes   O seldom   O never

5. I check food labels before purchasing a product for the first time.
   O always   O almost always   Osometimes   O seldom   O never

6. I plan menus before I go food shopping.
   O always   O almost always   O sometimes   O seldom   O never

7. I go to more than one store to find the best buys or to try to get food at the lowest prices.
   O always   O almost always   O sometimes   O seldom   O never

8. I am the major food shopper for my family.
   O always   O almost always   O sometimes   O seldom   O never

9. I complete my grocery shopping in approximately _____.
   O less than 10 minutes   O 30–59 minutes
   O 10–29 minutes   O more than one hour

10. I go grocery shopping _____.
    O more than once a week   O once a month
    O once a week   O other (Please specify.) _____
    O every other week

11. I have access to a computer equipped with the Internet.
    Oyes   O no
    If yes, how often do you use the Internet?
    O daily   O monthly
    O weekly   O never

12. Are you familiar with the concept of online food shopping through the Internet.

    O yes   O no

    If yes, I know about online food shopping because . . .

    O I have used the service.

    O I know someone who has used the service.

    O I have read about the service.

    O other (Please specify.) _____

13. Rank these benefits in order of importance when considering online food shopping.

    (1 is the most important and 5 is the least important.)

    ___ price

    ___ delivery service

    ___ credit card security

    ___ quality and selection of products

    ___ convenience

    ___ other (Please specify.) _____

14. Which of these characteristics would be your greatest concern when deciding to use an online food shopping service?

    O high prices

    O delivery service

    O credit card security

    O convenience

    O quality and selection of products

    O other (Please specify.) _____

15. Would you consider using an online food shopping service? • yes • no

16. Please indicate your gender.   O female   O male

17. Please indicate your age.

    O 18–29   O 50–59

    O 30–39   O 60–69

    O 40–49   O 70 and up

18. Please indicate your race/ethnic origin.

    O Caucasian   O Asian/Pacific Islander

    O African-American   O Other _____

    O Hispanic

19. Please indicate your educational background.

    O less than high school

    O high school graduate or equivalent

    O some college

    O college graduate (undergraduate)

    O beyond four years of college (graduate training)

20. Please indicate your combined family income.

    O less than $10,000   O $40,000–$49,999

    O $10,000–$19,999   O $50,000–$74,999

    O $20,000–$29,999   O $75,000–$100,000

    O $30,000–$39,999   O more than $100,000

21. Please indicate the number of people in your household. ____

    How many children? _____

22. I reside in ... (city) _____, (state) _____ (zip code) _____.

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