CUSTOMER SATISFACTION AND SALES PERFORMANCE IN U-PICK OPERATIONS

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ABSTRACT

This paper aims to study how customer satisfaction (CS) affects sales performance (SP) in u-pick berry farms in New York State. Even though CS has been a topic studied in marketing for a long time, there is very limited literature applied in u-pick operations. A survey was conducted in 6 u-pick berry farms from strawberry harvesting time (June 2019) to blueberry harvesting time (July to August 2019). Principal component analysis was used to summarize satisfaction attributes into three factors named *experience*, *retailing* and *convenience*. Then, a discrete choice model was applied to investigate the relationship between factors and overall CS. An Ordinary Least Square regression model was used to understand how satisfaction factors affected SP. This paper could be beneficial for u-pick berry farms to improve their SP and make better strategic marketing decisions, while suggestions for u-pick farms can also be extended to other Direct-to-Consumer marketing channels.

Keywords: Customer satisfaction, Sale performance, Satisfaction-Profit-Chain.

BIOGRAPHICAL SKETCH

Zou Yang is a master student from Applied Economics and Management at Cornell University. She is interested in quantitative marketing, specifically in customer analysis. She is a student of Prof. Miguel Gomez and her minor is Prof. Vithala R. Rao.

[Dedicated to former self]

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LIST OF ABBREVIATIONS

CS: Customer satisfaction

SP: Sales performance

DTC: Direct-to-Consumer

PCA: Principal Component Analysis

SPC: Satisfaction-Profit Chain

OLS: Ordinary Least Square

LIST OF SYMBOLS

$F_1, F_2, \dots, F_M$: factors of customer satisfaction

$\beta_{10}, \beta_{20}, \beta_{30}$: intercepts of each equation (2)-(4)

V_i : control variables including first-time visitor, age, male, education, maximum temperature, rainy, strawberry season in equations (2)-(4)

$\propto$: coefficients for each variable

β_i: coefficients for each variable

INTRODUCTION

U-pick is a marketing channel where customers can harvest fresh fruit and vegetables by themselves, paying lower prices and selecting fresher products (Lloyd, Tilley and Nelson, 1987). Crops that need intensive labor and little expertise to harvest are well-suited for u-pick sales, such as apples, berries and tomatoes. There is a long history of u-pick business models in the United States. These operations have gradually flourished since 1930s and 1940s, when they began because of a shortage of labor and low produce prices during the great recession and the World War II (Martinez ,2010).

U-pick is one of the important Direct-to-Consumer (DTC) channels in local food systems. Local food systems are becoming more and more popular among consumers in recent years, with both the number of participating producers and the value of local food sales growing (Low et al, 2014). Development of local food systems not only benefits the local economy, environment, food access and nutrition but also, as this paper will show, can increase consumers' satisfaction with their shopping experience. In local food systems, u-pick operations are also a crucial means to enhance sustainability in the fresh fruit and vegetables sector. With the development of local food systems, both sales and the number of u-pick farms grew until today.

As a DTC channel, u-pick farms interact with their customers in many ways. The quality of products and services delivered by u-pick operations play an important role in satisfying customers. Therefore, studying consumer satisfaction (CS) is important for the success of u-pick operations. In many previous studies, CS is estimated to be an essential driver for both firm performance and sales performance

(SP). CS has a direct relationship between how customers rate a firms' performance and their overall CS and intention to return (Torres-Moraga et al., 2008). In addition to the firms' financial performance (Anderson and Sullivan, 1993), CS also increases SP in other ways, such as enhanced customer brand loyalty (Aaker and Jacobson, 1994; Ittner and Larcker, 1998) and reduced cost in attracting new consumers (Gitman and McDaniel, 2004; Posselt and Gerstner 2005; Kolter and Keller, 2006). Not all satisfaction attributes work for all business operations. So, if firms are interested in improving CS, it is important that they identify the specific attributes that will impact CS more effectively, and therefore drive their sales performance (Ford and Heaton, 1999; Gundersen et al., 1996). Because the quality of products along with services and facilities are specific attributes for u-pick operations, they are the focus of this study.

Even though CS has been studied in several business sectors and has been proven to be crucial for improving firm financial performance, the role of CS still needs to be examined in many practical applications such as in farms with u-pick operations. Understanding the key satisfaction attributes in a u-pick operation can improve the farm sales and enhance customer shopping experience. In addition, this study also contributes to the larger field of applied economics in DTC marketing channels. The DTC marketing channel is receiving increasing attentions because suppliers are able to provide both an outstanding product and an outstanding overall experience to their customers without "middleman", retailers. These direct relationships, in turn, forges trust and loyalty with their customers (Hendershot, 2020). Since u-pick operations is a DTC marketing channel, our study in u-pick operations can also provide practical implications for other types of DTC marketing channels.

In this study, we focus on CS in u-pick operations and investigate the Satisfaction-Profit Chain framework. We conducted a survey to measure customers' perceptions of many attributes related to their visiting experience in six u-pick berry farms in the suburban area of Albany in New York State. Using this framework of the Satisfaction-Profit Chain, a principal component analysis (PCA) was first conducted to identify the factors driving CS and then multiple regression analysis was used to examine the link between CS and SP.

Through the PCA, this study first summarized the three most important factors driving overall CS. These are named 'experience', 'retailing service' and 'convenience'. Then, we use a logit model to show that the experience and retailing service are the drivers of overall CS. The OLS regression results indicated a positive relationship between experience and convenience factors and SP, while relationship between retailing service and SP was statistically insignificant. Based on the research results, this study provided implications to shed light on how to improve CS and SP in u-pick operations through better marketing decisions.

This study makes three contributions to the literature. First, we investigated the satisfaction attributes that affect overall CS in u-pick berry farms. Second, we applied the Satisfaction-Profit Chain framework to u-pick farm operations. Third, we provided insights to farmers and managers to improve the sales performance of DTC channels.

LITERATURE REVIEW

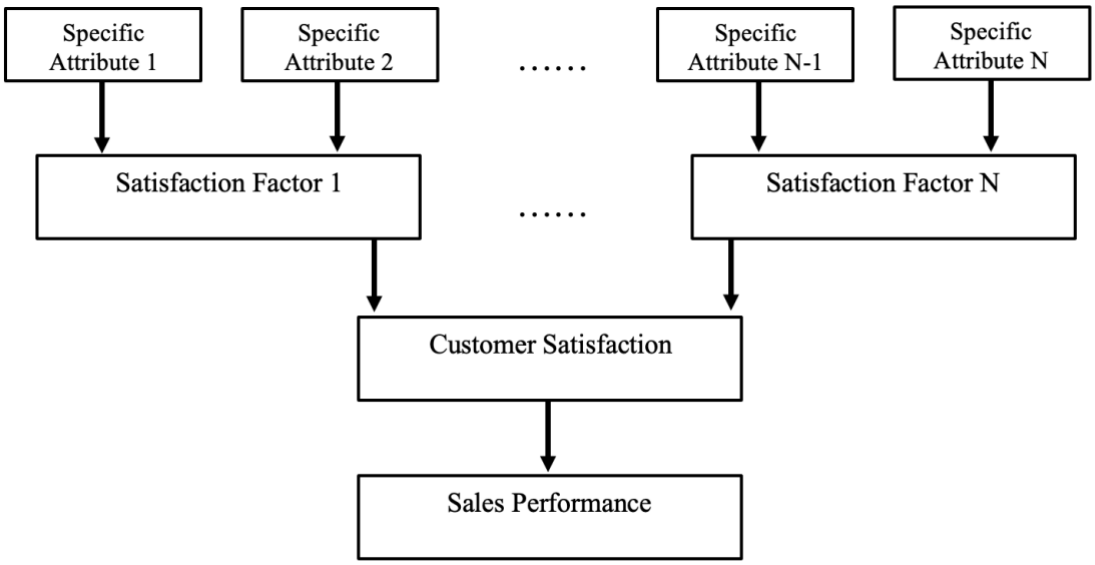
Although marketing has historically been rooted in the production and exchange of goods and services, growing research attention is devoted to factors contributing to desirable tangible and intangible customer outcomes (Rust and Oliver 1994; Vargo and Lusch 2004). Firm investment in those intended outcomes could deliver customer value for fostering strong and positive customer perceptions, attitudes, and behaviors which drive firm performance.

In many studies, empirical evidence shows that to the extent customers could be highly satisfied, CS is more likely to produce economic advantages to firms. For instance, in Anderson and Sullivan's study (1993), they investigated the linkage between antecedents and the consequences of customer satisfaction (CS). They estimated that CS affected firms' financial performance and customers repurchase intentions. In addition, some researchers (Aaker and Jacobson, 1994; Ittner and Larcker, 1998) have shown that satisfied customers could be beneficial for firms' market value and enhance brand loyalty. Strengthened loyalty could help firms differentiate their products from other similar competing products without the need of price competition. Gitman and McDaniel (2004) and Posselt and Gerstner (2005) demonstrated that improved customer retention and customer loyalty could eventually lead to increased profits. Besides increased profits, there are some other benefits in reducing cost. For example, cost of remaining an old customer is less than the cost that attracts a new customer (Kolter and Keller, 2006). Meanwhile, the customer profit rate tends to increase over the lifetime of the retained customer due to increased purchases, referrals, price premiums and reduced operating costs for customer service (Kotler and

Keller, 2006). Moreover, satisfied customers would be more willing to provide positive word of mouth (Torres-Moraga et al., 2008). This advertising effect could induce more future visits.

Based on the importance of CS, therefore, research has focused on how firms can create value, deliver value, and receive value by interfacing with their customers (Rust and Chung 2006). Among many frameworks, the Satisfaction-Profit Chain (SPC) (Heskett, 1994) has emerged as a crucial framework to study these issues. The SPC is a conceptual framework connecting the delivery of customer experiences to their evaluation by customers, and then to the market behavior of customers and the attendant financial performance (Frennea et al, 2016). To investigate the validity of the SPC framework, researchers first addressed the importance of customer satisfaction attributes that make a difference in the overall customer experience (Grnholdt and Martensen, 2005; Torres-Moraga et al., 2008). Then, to avoid multicollinearity issues in statistical analyses, the attributes were summarized into fewer number of satisfaction factors. These selected factors capture most of the variation of satisfaction attribute scores. Then, researchers link satisfaction factors and overall CS to sales performance of product or service or attendant financial performance (Gómez et al, 2004). In this study, we extend the use of the SPC framework to berry farm using u-pick marketing channels, echoing the research suggestions of Rust and Chung (2006). Following Customer Satisfaction-Sales Performance chain in previous study (Gómez et al, 2004), we show the elements of the SPC in Figure 1.

Fig. 1. The Satisfaction-Profit Chain



CS has been widely studied and assessed in different business sectors to understand its impact on the market behavior of customers and on the financial performance of firms. In the banking industry, for example, CS and consumer trust towards the organization determine consumer loyalty (Filip and Anghel, 2009; Hafeez and Muhammad, 2012). In the supermarket sector, previous studies investigate the relations between attributes perceptions, overall CS and SP and strengthen the SPC framework by adding nonlinearity and asymmetries in the study of such links (Gómez et al, 2004; Daniel et al., 2009). In the winery industry, Shapiro et al. (2014) identify attributes of the tasting room that generate a positive customer reaction and then help managers make profit-maximum decisions. In restaurant sector, researchers have tested multilevel frameworks of employee service performance and examined individual-level and store-level antecedents of service performance as well as the impact of cross-level interactions on service performance (Liao and Chuang, 2004).

However, researchers seldomly studied the impact of CS in local food systems. The present study addresses this gap in the literature by focusing on the SPC in the u-pick marketing channel.

With the popularity of public concerns in the environment and community, local food systems have become a popular subject of the U.S. Department of Agriculture in recent years. Several studies have shown that local food systems could generate public and economic benefits. Christian et al. (2008) suggested that local food systems could reduce food safety risks through decentralizing production. In addition, public benefits also cover the development of social capital in local community, the preservation of cultivar genetic diversity and the protection of environment quality (Goland and Bauer, 2004). Local food systems could impact the local economy in the form of higher income and employment growth. Martinez et al. (2010) concluded that local food systems could become a development strategy for rural areas, allowing farmers to obtain greater share of the food dollar and encouraging local employment growth. U-pick operations as one part of local food systems that supports farms which have labor-intensive crops with a feasible way to reduce cost in harvesting, delivering and packing (LeRoux et al., 2010). U-pick operations, along with other direct to consumer channels, provide higher survival rate for farms compared to the intermediated marketing channel.

U-pick operations, as one of the important direct to consumer marketing channel in local food systems, interact with customers in many ways. Services provided in u-pick operations, like in other service sectors, could also affect customers' evaluations of service encounters, CS, customers' purchases and the

frequency of their future visits. Therefore, it is meaningful to understand what attributes reflect service performance provided in u-pick operations. The purpose of this study is to apply the SPC framework to u-pick operations as well as to extent the empirical application of SPC to DTC marketing channels of fresh fruits and vegetables.

EXPERIMENTAL DESIGN

Customer satisfaction surveys were applied to customers among six similarly sized berry farms in New York State, near the city of Albany, New York. Among the six farms participating in the study, two produce only strawberries; one produces only Blueberries; and three produce both strawberries and blueberries. Given the different harvesting seasons of strawberries and blueberries, we collected surveys in farms to correspond with their different harvesting schedules. For example, strawberry farms received the surveys in the second half of June 2019 and the blueberry farm beginning from July to late August 2019. For farms which grow both strawberries and blueberries, the survey covered both harvesting seasons. During the process of survey collection, we went to one farm each day. We delivered the survey at the exit of the farm or near the farm store. After customers finished picking up berries and paid their purchases, we asked them if they would like to fill out a survey for us. Only one person would fill out the survey if they are part of a group visit.

The survey was designed to ask customer perceptions about their overall experience and 18 satisfaction attributes during a visit to a u-pick berry farm. The questions included in this survey were developed through a combination of online customer reviews, interviews with farmers, and survey questions used in previous CS studies. Meanwhile, we also employed survey questions in previous u-pick study from Lloyd, Tilley and Nelson (1989). They mentioned there were some important areas that should be evaluated such as customers' preferences, surrounding competing farms, crop variety and quality, and advertising. In addition, questions about purchase

and re-purchase intentions and reasons for visiting the berry farm were included in the survey. This survey also asked how much customers spent in total and in non-berry products separately. Customers were asked to rate these satisfaction attributes and overall experience on a scale of 1-5 with 5 being the highest. Lastly, demographic questions were added in this survey such as gender, age and education level, among others. The completed survey questions are presented in the Appendix.

MODEL & DATA

Conceptual Models

The SPC framework, first designed by Heskett et al. (1994), has been used in several empirical marketing studies (Anderson and Mittal, 2000; Gómez et al., 2004). This study employed this conceptual model to analyze the antecedents and the consequences of CS in u-pick operations. The application of the SPC framework included three components: a principal component analysis (PCA) to identify the factors driving CS; a discrete choice model to estimate the impact of these factors on overall CS; and a multiple regression analysis to examine the influence of overall CS and satisfaction factors on customer spending.

First this study identified the specific and measurable satisfaction attributes that drive overall CS. Then, these attributes were summarized into a smaller set of factors using a PCA. Each factor is a linear combination of a subset of the attributes and their variations could represent the overall variations of attributes. PCA helps reduce multicollinearity among satisfaction attributes and strengthen the statistical analysis of the impact of CS on SP. Originally, this study had 18 satisfaction attributes in our survey. Due to the insufficient information in some attributes, the actual number of attributes we used in PCA was 14 rather than 18. We selected all factors with eigenvalues exceeding one. The standard of choosing corresponding attributes for each factor is that each attribute falls into the factor if it has the highest score loadings in that factor. Thus, the PCA generated a vector of CS factors ($F_1, F_2, \dots, F_M$). F is the

factor score calculated as the arithmetic average of its attributes, (Gómez et al.,2004; Gupta et al.,2007). M is the number of factors.

After the PCA, we employed multiple regression analysis to investigate the impact of these CS factors on *overall CS*. Since most of the customers responded to this study with very high *overall CS*, the variation of *overall CS* was low (Table 1). To make up for this low variation, this study changed *overall CS* with 1 – 5 different levels to a binary variable named *dummy CS*. If the *overall CS* received a score of 5 the binary variable was set to 1, and if the overall CS received a score of 4 or lower, the binary variable *dummy CS* was set to 0. Then, a discrete choice model was used for analyzing the relationship between the *dummy CS* and the satisfaction factors summarized from PCA. Below is the estimated equation in which *dummy CS* is a function of the factor score.

$$Dummy\ CS = \propto_0 + \propto_1 * F_1 + \propto_2 * F_2 + \cdots + \propto_M * F_M + \varepsilon_1 \qquad (1)$$

Following the PCA, we investigated the impact *dummy CS* on sales performance measures while controlling for other customer characteristics that could affect customer behaviors. The sales performance measure used in this study was customer spending. The control variables include *male*, *education level, strawberry season* and so on. Since returning customers already had good impressions of the farm, they might be biased to a higher rating in surveys. Therefore, we tested the differences between first-time and returning customers in the CS factors rating (*overall CS, experience, retailing service and convenience*) and customer spending amount. The t-test results suggest that these two customer groups were different in spending amount and score ratings of satisfaction factors of *retailing service* and

convenience at the 10% significant level. To control for the spending effect caused by different customer groups, this study included first-time visitor as a control variable. Additionally, during the conversation with u-pick farmers, they highlighted that weather (e.g., rainy day and temperature) should be key to affect the number of visitors and revenue. Therefore, we added the variables of *maximum temperature* and *rainy day* to capture weather conditions. Farm dummy variables are also included to exclude the unobservable differences among farms. Thus, the equations to examine the link between *overall CS* or satisfaction factors and sales performance, while controlling for other variables affecting sales are:

$$Amount\ Spent = \beta_{10} + \alpha * Dummy\ CS + \beta_i * V_i + \varepsilon_2 \quad (2)$$

$$Amount\ Spent = \beta_{20} + \alpha_i * F_i + \beta_i * V_i + \varepsilon_3 \quad (3)$$

$$Amount\ Spent = \beta_{30} + \alpha_1 * F_1 + \alpha_2 * F_2 + \alpha_3 * F_3 + \beta_i * V_i + \varepsilon_4 \quad (4)$$

In equations (2)-(4), β_{10}, β_{20}, β_{30} indicate intercept of each model. *Fi* means CS factors of *experience, retailing service* and *convenience* we include each time in model (3). V_i are referred to control variables including *first-time visitor, age, male, education, maximum temperature, rainy, strawberry season*. $\propto$ and β_{i} are the coefficients for each variable.

We used a logit model to estimate equation (1) as *dummy CS* is a discrete variable. Ordinary Least Square (OLS) was used for equations (2) to (4) since the dependent variable *customer spending* was continuous variable. In the OLS models, we also included dummies for the six berry farms as binary variables to control the differences among farms and some intangible farm variables which we could not observe.

Descriptive Data Analysis

In total, 360 surveys were completed by customers. Any survey which appeared as anomalies were removed from this study such as, if customers ended up rating every satisfaction attribute Excellent (score 5). The number of usable surveys in this study was 312. Descriptive statistics of the variables using in the model are shown in Table 1. For overall CS, 225 customers rated 5 (excellent), 82 rated 4 (very good) and only 5 people rated below 4. The average overall CS was 4.71. Among all the customers, 97% purchased berries the day they visited the berry farm. The average amount each customer spent was $26.58 in each visit. Approximately 22% of customers were first-time visitors, 83.9% of customers said they would visit the same farm again in the same year, and 98.7% planned to visit the same farm next year. One hundred percent would recommend the farm to their friends.

Customers were also surveyed on demographic questions. The average group size was 3.5 individuals. Customers possibly regarded u-pick farm as a good place for family recreative because 40% of the groups came with at least one young child. Although 72% of respondents were females, we suspected these data did not represent the demography of the visiting customers, because women typically answered the survey questions for the entire group. The average customer who filled out the survey was 49 years old. Most customers had at least a college degree.

Other data for understanding CS surveys included weather, berry type and reason to visit the farm. 12% of respondents came to u-pick on a rainy day. 66% of surveys were filled out in the strawberry season. For multiple-choice question asking why customers came to the farm, 47% of customers stated, “to have fun”, 24% “to

entertain my kids", 80% chose "to purchase berry", and only 8% because "to experience a farm".

Table 1: Descriptive Statistics

Variables	Description	Mean (or % if indicated)	SD
Overall CS	Overall customer satisfaction (where 1=poor to 5=excellent)	4.71	0.49
Purchase	Percent of customers who purchased berries	97%	0.16
Amount	Average amount spent at u-pick farm	26.58	17.61
Purchase other product	Average amounts spend in non-berry product	1.17	4.43
First-time visitor	Percent of customers visiting farm for first time	22%	0.41
Comeback this year	Percent of customers who said they will come back this year	84%	0.36
Comeback next year	Percent of customers who said they will come back next year	99%	0.11
Number of people	Number of other people customers come with	2.51	0.71
Have young child	Percent of customers who brought children under 10	40%	0.49
Female		72%	
Male		28%	
Age	Average customer age	49	15.21
Education	1 - Less than a High Scholl degree	1%	
	2 - High School Diploma or GED	13%	
	3 - Some College/University	18%	
	4 - College Degree	34%	
	5 - Graduate Degree	34%	
Max temperature	The highest temperature of the day	83.75	4.61
Rainy	If it is rainy at the day customer visit U-pick	12%	0.32
Strawberry	Percent of customers who responded during the strawberry season	66%	0.47
Reason	To have fun	47%	
	To entertain my kids	24%	
	To purchase berry	80%	
	To experience a farm	9%	

Note: n = 312; for variables with percentage mean, answer with 1 is yes and otherwise is no.

Principal Component Analysis

This study implemented a PCA, which has been widely used in previous studies to reduce multicollinearity among satisfaction attributes (Gómez et al., 2004, O'Neill et al., 2002). Originally, we have 18 satisfaction attributes in our survey. However, we deleted 4 attributes with less than 200 observations. The Kaiser-Meyer-Olkin (KMO) measure equals 0.87 and suggests that the PCA is appropriate (Table 2). We summarized the 14 satisfaction attributes into three factors with an eigenvalue greater than 1. Then, we placed each attribute into the corresponding factor based on the highest absolute attribute loading after rotation. This study identified three factors driving CS: *customer experience*, *retailing service* and *convenience*. In factor *customer experience*, included attributes were related to berry product, such taste of berry product, variability of berry, quality of berry, berry prices and payment accepted. *Retailing* service refers to the interactions between farm staff and customers and includes cleanliness of the farm, helpfulness of staff, friendliness of staff and ease of checkout process. *Convenience* focuses on attributes like ease of finding the farm, ease of parking, farm location and finding information to plan your visit.

Average score for each factor was 4.43 (0.58)[1], 4.78 (0.39) and 4.58 (0.56) respectively. According to Gomez et al. (2004) and Gupta et al. (2007), the score for each factor was calculated as the arithmetic average of its attributes. Details about attributes included in each factor are presented in Table 2. Overall, scores of the three factors were between 4 (Very Good) to 5 (Excellent), indicating that customers were very satisfied with the products and services provided. Relatively high scores of

[1] Standard deviation in parentheses.

satisfaction factors in u-pick berry operations are consistent with the CS studies in other business sectors.

Table 2: Satisfaction Factors and Attributes of U-Pick Berry Farm Operations

Satisfaction factors	Survey elements - specific attributes	Factor Loadings	Specific Attributes Mean
(U-Pick) Experience	Taste of u-pick berries	0.52	4.67
Eigenvalue = 6.64	Availability of berry variety information	0.31	4.28
mean = 4.43	Quality of u-pick berries	0.44	4.75
	U-pick berry prices	0.41	4.35
	Forms of accepted payment	0.36	4.34
	Information upon entry	0.24	4.43
Retailing Service	Cleanliness of the farm	0.2	4.76
Eigenvalue = 1.36	Helpfulness of staff	0.54	4.78
mean = 4.78	Ease of checkout process	0.53	4.83
	Friendliness of staff	0.58	4.85
Convenience	Ease of finding the farm	0.25	4.67
Eigenvalue = 1.15	Ease of parking	0.62	4.57
mean = 4.58	Farm location	0.53	4.59
	Finding information to plan your visit	0.4	4.64

Note: 155 Observations; Kaiser-Meyer-Olkin measure = 0.87; Factor mean rating range from integer 1 (lowest) to 5 (highest).

FINDINGS

Regression Results

The results of the logit model are presented in Table 3, Model I. The Pseudo R square shows that around 22% of variation of *dummy CS* could be explained by three satisfaction factors. From the results, *experience* and *retailing service* are both statically significant at 1% and 10% significant level. The coefficient of *experience* indicates that an additional point increase in *experience* rating could lead to 20.4 percentage points increase in the probability of a customer who gives a score of 5 in *overall CS*. *Retailing service* is also a crucial satisfaction driver. The results showed a one-point increase in *retailing service* is associated with an 11.6% increase in the probability of receiving 5 rating score in *overall CS*. In terms of the *convenience* factor, we did not find enough evidence to say *convenience* would impact the *dummy CS*. Therefore, from the attributes included in factors of *experience* and *retailing service*, we may conclude that the consumer overall rating scores would be affected by the quality of the berry product (such as taste, variety, price) and the facilities in the u-pick operations (such as cleanliness of the farm, helpfulness of staff, accepted payment form). In addition, whether *convenience* (which includes farm information, farm location, ease of finding farm and parking) would affect a high rate of CS may need more information to estimate.

Table 3: Regression Results

	I	II	III	IV	V	VI
	Dummy CS	Amount ($)	Amount ($)	Amount ($)	Amount ($)	Amount ($)
Variable of interest						
Dummy_CS		1.23				
		(2.32)				
Experience	1.40***		3.14*			1.81
	(0.34)		(1.81)			(2.52)
Retailing Service	0.89*			3.65		0.34
	(0.47)			(2.70)		(3.61)
Convenience	0.45				3.38*	2.08
	(0.31)				(1.92)	(2.52)
Control variables						
1st visitor		-5.74**	-5.72**	-5.40**	-5.28**	-5.43**
		(2.41)	(2.41)	(2.41)	(2.41)	(2.43)
Come Back This Year		-2.16	-2.79	-2.14	-2.96	-3.03
		(2.75)	(2.75)	(2.74)	(2.78)	(2.81)
Come Back Next Year		5.73	4.35	5.18	3.54	3.51
		(9.35)	(9.34)	(9.34)	(9.39)	(9.42)
Purchas Other Product		0.30	0.29	0.29	0.28	0.28
		(0.22)	(0.22)	(0.22)	(0.22)	(0.22)
Strawberry Season		8.27*	8.87*	8.77*	8.53*	8.72*
		(4.63)	(4.55)	(4.56)	(4.55)	(4.57)
Education		1.94**	2.043**	1.97**	1.90**	1.96**
		(0.98)	(0.98)	(0.97)	(0.97)	(0.97)
Male		3.76*	4.18**	3.85*	3.88*	4.09*
		(2.16)	(2.16)	(2.16)	(2.15)	(2.18)
Age		0.09	0.08	0.08	0.06	0.07
		(0.069)	(0.069)	(0.069)	(0.07)	(0.07)
Rainy		4.66	5.27	5.11	4.79	5.14
		(4.05)	(4.05)	(4.06)	(4.04)	(4.07)
Max Temperature		-0.12	-0.11	-0.10	-0.14	-0.13
		(0.27)	(0.27)	(0.27)	(0.27)	(0.27)
Observations		274	274	274	274	274
R^2 or pseudoR^2		0.105	0.114	0.110	0.115	0.117

Note: * p<= 0.10, ** p<=0.05, *** p <= 0.01

Models II to VI in Table 3 present the results from Ordinary Least Square (OLS) multiple regression models. To investigate the relationship between SP and CS related variables, the model includes such control variables as whether the respondent was a first-time visitor, if the customer will come back again this year, if the customer will come back next year, whether the visit took place happened in the is strawberry season, rainy, daily maximum temperature, male, age, education and six farm dummy variables. From model II, results suggest that customers who are highly satisfied (score = 5) spent $1.23 more than the rest (score =1, 2, 3, 4).

From model III to model V, we evaluated the impact of the three satisfaction factors on spending separately. The estimated coefficients of *experience* and *convenience* are statistically significant. Results suggest that a one rating point higher in *experience* and *convenience* is associated with $3.14 and $5.17 more on customers' spending, respectively. These results are statistically significant at the 10%. However, satisfaction factor *retailing service* does not show statistically significant relationship with customers' spending. Even though attributes of *retailing service* have a significant impact on previous customer satisfaction studies such as winery (Shapiro et al.,2014), they are not in this study. It may be related to the nature of u-pick operations. In New York wineries, wine tasting room is the primary source of wine sales and highly dependent on the service provided by staff. However, u-pick operations do not need many staff services. Therefore, attributes of retailing service may not impact sales of u-pick operations.

In Model VI, when we combined all of the factors in one model, neither of them has a significant impact on customers' spending. The possible reason for this

could be that there exists some degree of collinearity among the three satisfaction factors.

Results suggest that, the variable, *first-time visitor* was statistically significant in models II to VI. If the customer is a first-time visitor, then the customer would spend around $5.5 less than a come-back customer. Meanwhile, customers visiting during the strawberry season spent around $8 more than those visiting in blueberry season. Demographic variables such as *education* and *male* exhibited statistically significant impacts on customers' spending. These results suggest that customers with one level higher education would spend around $2 more holding other variables constant. Male customers would spend around $4 more compared with the amount that female customers would.

To understand how each satisfaction attribute affected the amount spending, we analyzed the relationship between each attribute and sales performance separately in OLS models with several control variables (Table 4). We found that among attributes in the *experience* factor, "Taste of u-pick berries" and "Information upon entry" are statistically significant and positively affect spending. A one-point increase in "Taste of u-pick berries" score leads to a $2.68 increase in amount spent. As for "Information upon entry", the effect is that a one point higher in score is associated with $2.57 higher in spending. "Ease of parking" and "Farm location" were significant satisfaction attributes in factor of convenience: a one-point higher score in those attributes leads to $3.67 and $2.81 increase in amount spent respectively. The result is showed in Table 4.

Table 4: Regression Analysis of Satisfaction Attributes

Satisfaction factors	Survey elements - specific attributes	Coefficient
Experience	Taste of U-Pick berries	2.68*
	Availability of berry variety information	1.29
	Quality of U-Pick berries	1.98
	U-Pick berry prices	-0.26
	Forms of accepted payment	0.45
	Information upon entry	2.57**
Retailing Service	Cleanliness of the farm	3.135
	Helpfulness of staff	1.16
	Ease of checkout process	1.42
	Friendliness of staff	3.3
Convenience	Ease of finding the farm	2.65
	Ease of parking	3.67**
	Farm location	2.81*
	Finding information to plan your visit	-1.52

Note: * p<= 0.10, ** p<=0.05, *** p <= 0.01

IMPLICATIONS FOR U-PICK BERRY FARMS

From the evidence of analysis results, this study found the relationship between satisfaction factors and sales performance in u-pick operations. This study first suggests that u-pick operations should pay attention to the drivers of customer satisfaction to increase sales. In addition, given the results from Table 4, this study identifies specific satisfaction attributes in each satisfaction factors that will probably affect consumers' spending amount.

Since the analysis showed that the factors *experience* and *convenience* have statistically significant effects on visitor spending, u-pick berry operations should pay attention to the attributes in those factors. "Taste of u-pick berries" and "information upon entry" could positively affect amount spending. This study findings suggest that maintaining good quality berries is always important. Ensuring a high quality of berry of u-pick customers could affect not only the berry prices but also generate positive word-of-mouth. As for the attribute "Information upon entry", we suggest that signs such as directions to the farm and within the farm should be clear to customers upon arrival. When customers arrive at the u-pick farm, information related to parking, amenities, picking directions and berries should be clearly explained via signs and farm staff. Showing a story or history about the farm could also lead to a more satisfying customer experience. In the factor *convenience*, "ease of parking" and "farm location" have a positive relationship with amount spending. We suggest u-pick farms should provide enough parking spaces for their customers and clear sign to direct customers to parking spaces.

Additionally, since returning customers would spend more money and had a higher CS than first-time customers would, this study also recommends maintaining good relationship with returning customers. For example, u-pick farm managers can collect visiting customer mail information, so farms can send the notification to the customer for incoming berry season.

Additionally, to echo the points mentioned by u-pick farmers, we included the control variables of rainy day and the highest temperature of the day into the models and showed relationships between rainy day and temperature and customers' spending. The results turned out that we could not tell the relationship between the maximum temperature of the day and amount spending, while we found a positive correlation between rainy day and amount spending. If it was rainy day, customers would spend more than that day was not. The reason behind might be related to the fact that people who go to a berry farm in the rainy day would have a higher purchase intention, leading to higher spending. Therefore, u-pick operations are suggested to be open even that day is rainy during the harvesting season, given that visitor spending would be higher in rainy day.

Even though this research focuses on u-pick berry operations, we believe that the findings are relevant for all types of u-pick operations and may also provide helpful suggestions to other DTC marketing channels.

CONCLUSIONS

U-pick operations are one of the important marketing channels in local food systems. This study extended the Satisfaction-Profit-Chain framework to u-pick farm operations. We conducted CS surveys among visitors of six u-pick berry operations in New York State from the middle of June to the beginning of August 2019. We summarized fourteen satisfaction attributes into 3 satisfaction factors: *experience*, *retailing service* and *convenience*. We show that the factors *experience* and *convenience* are the primary drivers of *overall CS*. Meanwhile, in the OLS regression model, *experience* and *convenience* had statistically positive impact on customer spending. We found not statistically significant relationship between the factor *retailing service* and customer spending.

Based on these results, our study provided valuable implications for u-pick berry farms and the whole sector of u-pick operations. We provided practical suggestions related to the importance of satisfaction attributes such as “taste of u-pick berries”, “information upon entry”, “ease of parking” and farm location” to increase sales. We also recommended maintaining good relationship with returning customers as an appropriate strategy to improve sales performance. We believe that these suggestions could be possibly applied to all types of u-pick operations and to other DTC marketing channels.

We showed the link between CS and SP in the sector of u-pick operations. However, there are some limitations in this research. First, the sample size of the study was relatively small. Due to this limitation, this may have not found evidence of links between the level of overall CS and customer amount spending. This relationship can

be explored in future studies using a larger sample size. The unstated relationship maybe also because around 72% of surveys responded “Excellent” to overall CS. A few of variations in the overall CS limited the ability of this study to access its impact on amount spending. Future studies can address this problem by improving the survey designing; In addition, the R-square among our five models is very low, because there are some other variables that affect the customers’ spending but are not included in this study. Also, data related to market structure (e.g., competing u-pick operations) and advertising methods (e.g., word of mouth, signs) can be added in the future to examine the impact of competition and word of mouth on CS and SP.

REFERENCE

Anderson, E.W., Fornell, C., Lehmann, D.R. (1994). Customer satisfaction, market share, and profitability: findings from Sweden. *Journal of Marketing Science, 58* (3), 53–66.

Anderson, E.W., Sullivan, M.W. (1993). The antecedents and consequences of customer satisfaction for firms. *Marketing Science, 12* (2), 125–143.

Aaker, D. and Jacobson, R. (1994). The financial information content of perceived quality. *Journal of Marketing Research, 31*, 191-201.

Arnold, M.J. and Reynolds, K.E. (2000). Customer loyalty to the salesperson and the store: examining relationship customers in an upscale retail context. *Journal of Personal Selling& Sales Management, 20*(2), 89-98.

Daniel H. Simon, Miguel I. Gómez, Edward W. McLaughlin, & Dick R. Wittink (2009). Employee Attitudes, Customer Satisfaction, and Sales Performance: Assessing the Linkages in US Grocery Stores. *Managerial and Decision Economics, 30*(1), 27.

Filip, A., Anghel, L.D. (2009). Customer loyalty and its determinants in a banking services environment. *Amfiteatru Economi*c, *11*(26), 288.

Frennea, Carly, Mittal, Vikas and Westbrook, Robert A. (2014). The Satisfaction Profit Chain. Available at SSRN: https://ssrn.com/abstract=2425656

Gitman, L.J. and McDaniel, C.D. (2004). *The Future of Business: The Essentials*. Southwestern, Mason, OH.

Grnholdt, L., & Martensen, A. (2005). Analyzing customer satisfaction data: A comparison of regression and artificial neural networks. *International Journal of Market Research, 47*, 121–130.

Gupta, S., McLaughlin, E.W. and Gomez, M.I. (2007). Guest satisfaction and restaurant performance. *Cornell Hotel & Restaurant Administration Quarterly, 48*(3), 284-298.

Gómez, M., McLaughlin, E. and Wittink, D. (2004). Customer satisfaction and retail sales performance: an empirical investigation. *Journal of Retailing, 80*, 265-278.

Goland, C., and S. Bauer. (2004). When the Apple Falls Close to the Tree: Local Food Systems and the Preservation of Biodiversity. *Renewable Agriculture and Food systems, 19*, 228-236.

Hafeez, C., Muhammad, B. (2012). The impact of service quality, customer satisfaction and loyalty programs on customer's loyalty: evidence from banking sector of Pakistan. *International Journal of Business Science, 3* (16), 200–209.

Heskett, James L., Jones, Thomas O., Loveman, Gary W., Sasser, W. Earl, & Schlesinger, Leonard A. (1994). Putting the service-profit chain to work. *Harvard Business Review, 72*(2), 164–174.

Hendershot, S. (2020). Lessons from direct-to-consumer marketing strategies. Retrieved March 26, 2021, from https://us.epsilon.com/core-content/lessons-from-direct-to-consumer-marketing-strategy

Ittner, C. and Larcker, D. (1998). Are nonfinancial measures leading indicators of performance? An analysis of customer satisfaction. *Journal of Accounting Research, 36*, 1-35.

Johnson, R., & Cowan, T. (2018). Local food systems: selected farm bill and other federal programs. ([Library of Congress public edition].). *[Washington, D.C.]: Congressional Research Service.*

Kotler, P. and Keller, K.L. (2006), *Marketing Management*. Pearson Prentice-Hall, Upper Saddle River, NJ.

Liao H, Chuang A. (2004). A multilevel investigation of factors influencing employee service performance and customer outcomes. *Academy of Management Journal, 47*, 41–58.

Lloyd, R.M, Tilley, D.S, Nelson, J.R. (1987). Should I Grow Fruits and Vegetables? Pick-Your-Own-Markets. *Food and Agriculture Organization of the United Nations (184)*, 4.

Low S.A., et al (2014). Trends in U.S. Local and Regional Food Systems. *U.S. Department of Agriculture, Economics Research Service*.

Martinez, M., M. Hand, M. Da Pra, S. Pollack, K. Ralston, T. Smith, S. Vogel, S. Clark, L. Lohr, S. Low, and C. Newman. (2010). Local food systems: concepts, impacts, and issues. *U.S. Department of Agriculture, Economics Research Service*.

M.N. LeRoux, T.M. Schmit, M. Roth, & D.H. Streeter. (2010). Evaluating marketing channel options for small-scale fruit and vegetable producers. *Renewable Agriculture and Food Systems, 25*(1), 16.

Murali, S., Pugazhendhi, S., & Muralidharan, C. (2016). Modelling and Investigating the relationship of after sales service quality with customer satisfaction, retention and

loyalty – A case study of home appliances business. *Journal of Retailing and Consumer Services, 30*, 67–83.

Nunan, D., Sibai, O., Schivinski, B., & Christodoulides, G. (2018). Reflections on "social media: Influencing customer satisfaction in B2B sales" and a research agenda. *Industrial Marketing Management, 75*, 31–36.

O'Neill, M. and Charters, S. (2000). Service quality at the cellar door: implications for Western Australia's developing wine tourism industry. *Managing Service Quality, 10*(2), 112-122.

O'Neill, M., Palmer, A. and Charters, S. (2002). Wine production as a service experience – the effects of service quality on wine sales. *Journal of Services Marketing, 16*(4), 342-362.

Christian J. Peters, Nelson L. Bills, Jennifer L. Wilkins, & Gary W. Fick. (2009). Foodshed analysis and its relevance to sustainability. *Renewable Agriculture and Food Systems,* 24(1), 1–7.

Posselt, T., & Gerstner, E. (2005). Pre-sale vs. Post-sale e-satisfaction: Impact on repurchase intention and overall satisfaction. *Journal of Interactive Marketing (John Wiley & Sons), 19*(4), 35–47.

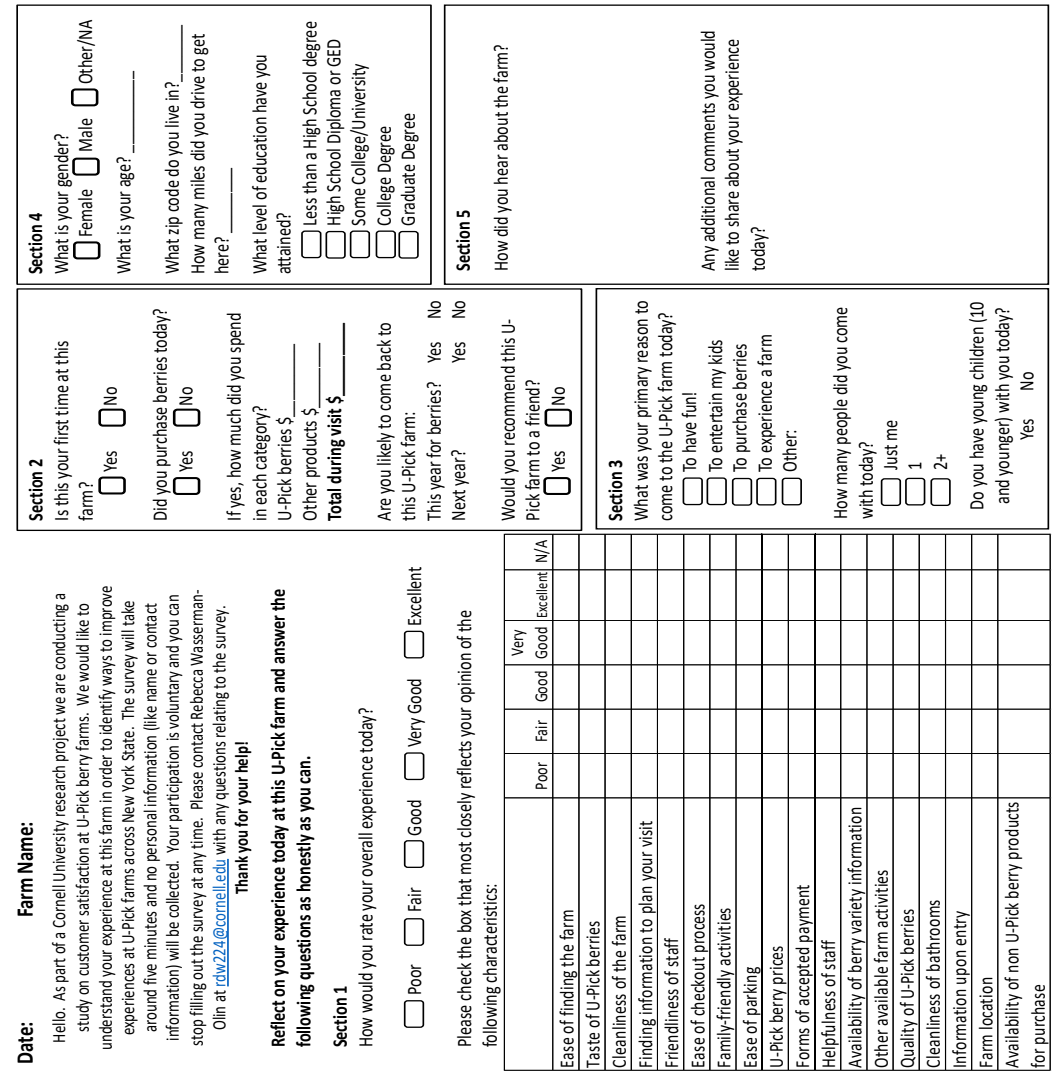
Roland T Rust, Tuck Siong, Chung (2006). Marketing models of service and relationships. *Marketing Science* (25), 6, 560 – 580.

Shapiro Marin, & I. Gómez Miguel. (2014). Customer satisfaction and sales performance in wine tasting rooms. *International Journal of Wine Business Research, 26*(1), 45–60.

Torres-Moraga, E., Va´squez-Parraga, A.Z. and Zamora-Gonza´lez, J. (2008). Customer satisfaction and loyalty: start with the product, culminate with the brand. *The Journal of Consumer Marketing, 25*(5), 302.

APPENDIX

Customer Satisfaction Survey



Date: **Farm Name:**

Hello. As part of a Cornell University research project we are conducting a study on customer satisfaction at U-Pick berry farms. We would like to understand your experience at this farm in order to identify ways to improve experiences at U-Pick farms across New York State. The survey will take around five minutes and no personal information (like name or contact information) will be collected. Your participation is voluntary and you can stop filling out the survey at any time. Please contact Rebecca Wasserman-Olin at rdw224@cornell.edu with any questions relating to the survey.

Thank you for your help!

Reflect on your experience today at this U-Pick farm and answer the following questions as honestly as you can.

Section 1

How would you rate your overall experience today?

☐ Poor ☐ Fair ☐ Good ☐ Very Good ☐ Excellent

Please check the box that most closely reflects your opinion of the following characteristics:

	Poor	Fair	Good	Very Good	Excellent	N/A
Ease of finding the farm						
Taste of U-Pick berries						
Cleanliness of the farm						
Finding information to plan your visit						
Friendliness of staff						
Ease of checkout process						
Family-friendly activities						
Ease of parking						
U-Pick berry prices						
Forms of accepted payment						
Helpfulness of staff						
Availability of berry variety information						
Other available farm activities						
Quality of U-Pick berries						
Cleanliness of bathrooms						
Information upon entry						
Farm location						
Availability of non U-Pick berry products for purchase						

Section 2

Is this your first time at this farm?
☐ Yes ☐ No

Did you purchase berries today?
☐ Yes ☐ No

If yes, how much did you spend in each category?
U-Pick berries $_____
Other products $_____
Total during visit $_____

Are you likely to come back to this U-Pick farm:
This year for berries? Yes No
Next year? Yes No

Would you recommend this U-Pick farm to a friend?
☐ Yes ☐ No

Section 3

What was your primary reason to come to the U-Pick farm today?
☐ To have fun!
☐ To entertain my kids
☐ To purchase berries
☐ To experience a farm
☐ Other:

How many people did you come with today?
☐ Just me
☐ 1
☐ 2+

Do you have young children (10 and younger) with you today?
Yes No

Section 4

What is your gender?
☐ Female ☐ Male ☐ Other/NA

What is your age? _____

What zip code do you live in?_____

How many miles did you drive to get here? _____

What level of education have you attained?
☐ Less than a High School degree
☐ High School Diploma or GED
☐ Some College/University
☐ College Degree
☐ Graduate Degree

Section 5

How did you hear about the farm?

Any additional comments you would like to share about your experience today?