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Predicting satisfaction and intentions to use online food delivery: What really makes a difference?

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ABSTRACT

Online food delivery (OFD) is no longer a new concept for the majority of Americans. Large food delivery companies make millions in revenues and those numbers are expected to increase. This study was conducted to investigate customer intentions to use OFD services through the evaluation of satisfaction, food quality, and OFD service quality. The OFD service quality was assessed via e-SELFQUAL dimensions, and included perceived control, service convenience, customer service, and service fulfillment. The study determined that food quality, control, customer service, and service fulfillment affect customer satisfaction in online food delivery services. Customer satisfaction showed a strong positive impact on behavioral intentions to use OFD.

KEYWORDS

Food Ordering; GrubHub;
food quality; e-SELFQUAL

Introduction

The Internet has become an integral part of the daily lives of many Americans and has significantly changed different aspects of people's lives, including the way how they shop. Shopping online is no longer a new phenomenon: web sales were responsible for 9.8% of retail sales in the third quarter of 2018, which was a 14.5% growth compared to the same quarter in 2017 (U.S. Department of Commerce, 2018). Smâros et al. (2000) suggested that successful businesses need to respond to technology changes to better accommodate needs of their customers. With this in mind, it is not surprising that the e-commerce giant Amazon.com has become the largest retailer in the world (Dean, 2019; Debter, 2019), reaching 280.5 USD billion in revenue in 2019 (Amazon, 2020).

Nowadays, individuals have opportunities to order a variety of food items online. The restaurant industry is a vast segment of the American economy and generated approximately 825 USD billion in 2018, according to the National Restaurant Association (2019), and can potentially increase clientele and profits by finding venues where customers can order meals online and get those meals delivered to their homes or offices. According to Statista (2019a), the penetration of online food delivery (OFD) services in the U.S. has reached 27.5% in 2018. This number demonstrates that a substantially high percentage of the population in the U.S. has utilized online food delivery services, but at the same time highlights a high potential of new customer acquisition among the remaining 72.5% of the population.

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In 2019, the worldwide OFD services generated 107 USD billion in revenue, and is forecasted to grow by about 10% by 2024 (Statista, 2019a). Out of this amount, the United States account for 22.1 USD billion, placing on the second position globally (after China). In 2018, the top three OFD platforms in the United States determined by the revenue and the number of users served included GrubHub (34.4% and 36%, respectively), UberEATS (27.9% and 31%), and DoorDash (17.9% and 17%) (Statista, 2019b). The platform-to-consumer deliveries that account for all orders placed on and delivered by one of the platforms (and not by a restaurant) are expected to be the leading force behind the growth of the OFD sector worldwide (Statista, 2019a, 2019b).

Food delivery companies built their business by providing online platforms that connect customers to the restaurants in the area, and charging restaurants a commission for placed orders (Cho et al., 2019). Some OFD platforms process the orders and run deliveries, while some others only facilitate the orders and leave the delivery to the restaurant (Statista, 2019a). In either case, the model relies on consumer ability to find appealing food options and generate orders. Therefore, the research problem of this study is grounded in the need to understand the factors that influence customer behavior of placing orders on OFD platforms.

The extant literature provides significant evidence confirming the relationship between quality, satisfaction, and behavioral intentions in the services industry (Cronin et al., 2000), including the hospitality (Berezina et al., 2012) and tourism (Baker & Crompton, 2000) industry, and the restaurant sector specifically (Ryu & Han, 2010). Therefore, this paper adopts the 'quality – satisfaction – behavioral intentions' paradigm to identify the antecedents of the customer intention to use OFD services. This research suggests that in order for OFD businesses to be successful, both the food and online service quality should be satisfying to the customers leading to the positive behavioral outcomes (Suhartanto et al., 2019).

While some studies on customer adoption of OFD services are already available (Cho et al., 2019; Gunden et al., 2020; Suhartanto et al., 2019; Yeo et al., 2017), this research stream is still in its infancy. Several publications available to date on the topic of customer selection and behavioral intentions toward OFD seem to follow the contingency framework (Anderson & Srinivasan, 2003) that builds on the relationship between satisfaction and loyalty to attract customers and ensure business continuity. However, all identified studies rely on different theoretical foundations to determine the factors that may predict customer attitudes or satisfaction with OFDS. Some publications chose technology adoption perspective to suggest antecedents of OFD adoption, and relied on such theoretical frameworks as extended model of information technology (IT) compliance (Yeo et al., 2017), mobile application quality attributes (Cho et al., 2019), technology acceptance model (TAM, Roh & Park, 2019), and unified theory of acceptance and use of technology (UTAUT2; Gunden et al., 2020). This paper presents a different approach and investigates OFD from the service quality perspective extending the train of thought documented by Suhartanto et al. (2019).

The purpose of this paper was to identify the factors that predict customer intentions to use OFD services. The main factors included in this research are: (a) e-service quality of the food ordering experience, and (b) the quality of food received. The e-service quality has been evaluated through consideration of four factors: perceived control, service convenience, customer service, and service fulfillment (Ding et al., 2011). The outcomes

of this study may be beneficial for both restaurants and online food delivery companies from the perspective of understanding which factors are most influential in terms of driving customer intention to use OFD services. The understanding of such factors may help restaurants in selecting distribution channels for their businesses. Also, the OFD companies may develop a better understanding of the aspects of their websites and services that are most valued by consumers.

Literature review

As a growing trend in the society, OFD services have attracted attention of the research community (Cho et al., 2019; Gunden et al., 2020; Kimes & Laque, 2011; Suhartanto et al., 2019; Yeo et al., 2017). As an emerging research field, the topic of OFD adoption and continued use has been investigated from various theoretical perspectives. Table 1 presents an overview of theoretical frameworks, and examined variables for the studies written about customer behavioral intentions toward OFD.

When examining Table 1, it is easy to notice that the primary interest of all studies evolved around the behavioral intentions of the consumer toward OFD. Such behavioral intentions represented customer intentions to use OFD services (Cho et al., 2019; Gunden et al., 2020; Roh & Park, 2019; Yeo et al., 2017), and recommend the services to others (Gunden et al., 2020). Suhartanto et al. (2019) examined behavioral intentions through the examination of customer loyalty, and operationalized this construct through customer intentions to purchase OFD services, intention to purchase if the price increases, and intention to recommend the service to others. Such operationalization of loyalty reveals similarities with other OFD studies that covered use (purchase) and recommendation intentions.

This study evaluates behavioral intentions toward OFD services from the perspective of evaluating e-service quality, and food quality, a theoretical stance also expressed by Suhartanto et al. (2019). The study relies on the premise that in the context of OFD, the overall experience is comprised of the online ordering experience and product (food) quality. The current study explores e-service quality by evaluating OFD service as a self-service process, and uses a multi-dimensional e-SELFQUAL scale (Ding et al., 2011) as

Table 1. Summary of key studies on behavioral intentions toward OFD.

Reference	Theoretical perspective	Predictor variable	Outcome variables
Yeo et al. (2017)	Contingency Framework, Extended Model of IT Continuance	Hedonic motivation, Prior experience, Time saving orientation, Price saving orientation	Convenience, Motivation, Post-usage Usefulness, Attitude, Behavioral intentions
Cho et al. (2019)	Mobile application quality attributes	Convenience quality, Design quality, Trustworthiness, Price quality, Various food choices Grouping variable: Single/multi-person household	Perceived value, Attitude toward an app, Intention to continuously use
Roh & Park (2019)	TAM	Convenience orientation, Compatibility, Subjective norm, Ease of use, Usefulness	Intentions
Suhartanto et al. (2019)	Composite loyalty	e-Service quality, Food quality	Perceived value, Customer satisfaction, Customer loyalty
Gunden et al. (2020)	UTAUT2, modified and extended	Performance expectancy, Habit, Impulse buying tendency, Congruity with self-image, Mindfulness	Intentions (to use and recommend)

opposed to a unidimensional construct of e-service quality utilized by Suhartanto et al. (2019). In line with previous studies, the current research investigates behavioral intentions to use OFD services, however, instead of a broader concept of loyalty focuses on the intention to use OFD. Given the involvement of a restaurant and a food ordering platform in OFD services, this study evaluates behavioral intentions with regard to both players.

Based on the positioning of the study presented above, the literature review continues with the review of literature on the service quality, e-service quality, and measurement of these constructs. The section further progresses to cover the literature on food quality and contribution of food quality to customer satisfaction. The section concludes with the examination of the link between satisfaction and behavioral intentions.

Service quality and evolution of service quality measurement

Service quality concept

Seyanont (2007) defined service quality as “a measure of how well the service level matches customer expectations” (p. 7). Perceived service quality is viewed in a similar way to perceived product quality when it is considered to be a customer’s opinion on the level of service they received (Warrington, 2002). In the context of online food delivery, the findings documented in the literature suggest that customer perception of the service quality may influence satisfaction with the service leading to loyalty toward the service (Suhartanto et al., 2019). Therefore, this study turns to the service quality literature in the effort to identify factors that may be influencing the quality of customer experience when ordering food online. The literature review continues with the review of evolution of the service quality measurement and identifying the factors that are relevant to the service quality of ordering food online.

Service quality measurement

Based on the chosen theoretical stance of predicting behavioral intentions toward OFD services via service quality, this section reviews a variety of research instruments that had been developed over the years with an intent to measure service quality. One of the measurements of service quality is a SERVQUAL model that was developed by Parasuraman, Zeithaml, and Berry in 1988 and was later applied to different industries (Ladhari, 2009), including the restaurant-related studies (e.g., Richard et al., 1994; Bojanic & Rosen, 1994). Initially, the model suggested 10 elements for measuring service quality, but later was reduced to five factors: reliability, assurance, tangibles, empathy, and responsiveness. This model was based on the gap between customer expectations and perceived level of service.

Even though SERVQUAL was instrumental in laying the groundwork for understanding service quality, it was criticized by several research studies (e.g., Cronin & Taylor, 1992, 1994; Iacobucci et al., 1994). Highlighting the lack of theoretical support for the expectations-performance gap model, Cronin and Taylor (1992) developed performance-only SERVPERF scale. SERVPERF was developed based on SERVQUAL retaining the 22 measurement items and five dimensions: reliability, assurance, tangibles, empathy, and responsiveness. However, the new scale was designed for measuring performance, eliminating the expectations component.

E-service quality measurement

Following the advent and penetration of the Internet, the concept and measurement of service quality was brought into the online domain as well. Yoo and Donthu (2001) introduced a SITEQUAL instrument that initially had 54 questions that were later reduced to a nine-item scale and four dimensions: ease of use, esthetic design, processing speed, and interactive responsiveness. The instrument evaluates how website quality affects online purchasing behavior.

Barnes and Vidgen (2002) developed WebQual 4.0 that was composed of 22 items and three dimensions: usability, information quality, and service interaction. WebQual had a total of four generations of scales, and scale 2.0 became the first one that focused specifically on e-service quality and customer satisfaction in the field of e-taxation. They also included an additional question that asked respondents to rank the overall quality of the website.

The ETail Q scale that was introduced by Wolfinbarger and Gilly (2003) focuses on the assessment of e-commerce websites. Initially, 275 questions were added to the original 22 survey items that were borrowed from SERVQUAL. By continuously analyzing the instruments and reducing a number of its items, the researchers retained 14 measurement items that could be grouped into four dimensions: website design, security/privacy, fulfillment/reliability, and customer service.

Parasuraman et al. (2005) established the E-S-QUAL scale that focused on problems that occur during online transactions while individuals shop online. Initially, the instrument had 121 survey items and 11 potential dimensions. The number of questions was eventually reduced to 23, and the results of the analysis suggested that the instrument should have four dimensions. A survey determined that efficiency and fulfillment were the most important dimensions that affected users' perceptions of website quality, while system availability and privacy were less important for consumers.

Following the development of E-S-QUAL, Boshoff (2007) used the E-S-QUAL instrument in a group of 1,409 people. By using exploratory factor analysis, the author suggested that six dimensions could be established instead of the initial four for 22 questions in E-S-QUAL. In addition to the original dimensions of efficiency, fulfillment, system availability, and privacy, Boshoff introduced two added factors, namely speed and reliability.

Later, Ding et al. (2011) suggested four constructs for measuring online self-service quality (e-SELFQUAL): perceived control, service convenience, customer service, and service fulfillment, as the main constructs that measure online service quality. In the instrument, they determined how a developed scale could predict customer satisfaction and customer loyalty specifically in a context of online self-service quality. A summary of aforementioned studies with corresponding measurement dimensions that document a variety of scales related to assessing service quality and e-service quality is shown in Table 2.

The table shows the evolution of the scales and their adjustment for a better fit to assess electronic/online service quality. Even though all scales differ in the dimensions that they are comprised of, certain similarities may be observed. It appears that reliability/fulfillment and ease of use/convenience are considered the main constructs that are presented in the instruments.

Table 2. Scales assessing e-service quality.

Scale	Citation	Dimensions
SERVQUAL	Parasuraman et al. (1988)	Reliability, assurance, tangibles, empathy and responsiveness
SERVPERF	Cronin and Taylor (1992)	Reliability, assurance, tangibles, empathy, and responsiveness
SITEQUAL	Yoo and Donthu (2001)	Ease of use, esthetic design, processing speed, and interactive responsiveness
WebQual 4.0	Barnes and Vidgen (2002)	Usability, information quality, and service interaction
ETail Q	Wolfenbarger and Gilly (2003)	Website design, security/privacy, fulfillment/reliability, and customer service
E-S-QUAL (electronic service quality)	Parasuraman et al. (2005)	Efficiency, fulfillment, system availability, and privacy
E-S-QUAL (revised)	Boshoff (2007)	Speed, reliability, efficiency, fulfillment, system availability, and privacy
e-SELFQUAL	Ding et al. (2011)	Perceived control, service convenience, customer service, and service fulfillment

E-service quality and satisfaction in the online food ordering

Customer satisfaction is not a new topic to academic and professional literature in the hospitality area and especially in general business literature. Customer satisfaction can be defined in a variety of different ways, and there is no standard definition across the literature. According to Oliver (1997), customer satisfaction can be described as a level of discrepancy between a client's expectations and perceptions, and Westbrook (1987) describes customer satisfaction as a "global evaluative judgment about product usage/consumption." (p. 260). In a highly competitive restaurant environment with a failing rate close to 60% in the first three years after opening (Parsa et al., 2005), satisfied customers are one of the main ingredients for long-term business success. Improving customer satisfaction should become one of the main focuses for many businesses (Barsky & Labagh, 1992).

Customer satisfaction may be achieved through different elements, and for service providing businesses, service quality is crucial. Previous research has evaluated e-service quality of OFD websites as a unidimensional construct, and supported a link between e-service quality and customer satisfaction (Suhartanto et al., 2019). This study relies on the e-SELFQUAL approach for the assessment of online self-service quality developed by Ding et al. (2011) that researchers felt was of the most assistance for this study. Online food ordering is an example of customer self-service on a website of a food delivery company. In addition, this study aims to assess the quality of ordering food online, and not so much the quality of the website itself. Therefore, it was decided that the scale specific to online self-service quality would be the best fit for this research. According to Ding et al. (2011), perceived control, service convenience, customer service, and service fulfillment are four main elements of online service quality. These elements along with the hypotheses for this study are presented below.

Perceived control

Perceived control can be defined as a individual's self-evaluation that can be affected by the person's own experiences (Bolt et al., 2001). Averill (1973) suggested that control has three main dimensions: behavioral, decisional, and cognitive. Behavioral control is defined

as a response that may affect the outcome of the event. Decisional control is defined as an extent of choice that an individual may have control over in eventual goals in a situation. Cognitive control is defined as a choice that an individual makes in relationship to an outcome of the situation. The scale evaluating online self-service includes the latter aspect of perceived control. In the context of e-commerce and online food ordering, perceived cognitive control refers to customers' understanding of the online process and its steps and their confidence in the ability to complete the order in reasonable time. Therefore, the following hypothesis is proposed:

H1. There is a relationship between customer perceived control and customer satisfaction with OFD ordering.

Service convenience

Service convenience became an established topic in marketing and consumer behavior literature over the course of decades. The term 'convenience' was introduced a century ago by Copeland (1923), who referred to it as the amount of time and effort a person spends while acquiring the product. Berry et al. (2002) defined service convenience as "consumers' time and effort perceptions related to buying or using a service" (p. 4). Colwell et al. (2008) suggested that service convenience can directly affect customer satisfaction. The concept of service convenience has been considered one of the important elements of e-service quality in the services literature (e.g., Zeithaml et al., 2002; Loiacono et al., 2002; Wolfinbarger & Gilly, 2003; Parasuraman et al., 2005; Fassnacht & Koese, 2006; Ding et al., 2007). Hence, the following hypothesis is stated for this study:

H2. There is a relationship between perceived convenience and customer satisfaction with online food ordering.

Customer service

Customer service may be conceptualized as timely, sincere, and responsive support from company's representatives during the pre- and post-purchase stages (Wolfinbarger & Gilly, 2003). Customer service that meets or exceeds guests' expectations is paramount for service industry successes. This concept has been investigated in prior research as one of the core constructs of service quality, as well as a supporting service. Customer service emerged as a dimension of e-service quality in early 2000 s (Wolfinbarger & Gilly, 2003), however, this construct has its roots in earlier service quality scales, such as responsiveness dimension in SERVQUAL (Parasuraman et al., 1988), SERVPERF (Cronin & Taylor, 1992), and SITEQUAL (Yoo & Donthu, 2001). Previous research documented a relationship between customer service and customer satisfaction (Ding et al., 2011); therefore, this study puts forward the following hypothesis for the context of online food ordering:

H3. There is a relationship between perceived customer service and customer satisfaction with online food ordering.

Service fulfillment

Service fulfillment is another major construct that is related to customer satisfaction (Parasuraman et al., 2005; Z. Yang et al., 2004). Parasuraman et al. (2005) suggested that fulfillment is a degree of promise provided by a website regarding order delivery and item availability. Li and Suomi (2009) suggested that in e-service it is important to provide customers with the right information about products or services during the purchasing process. Based on that, this study suggests the following:

H4. There is a relationship between fulfillment and customer satisfaction with online food ordering.

Food quality and customer satisfaction

When customers order food online, their experience with the entire process is influenced by the experience with the website of the online food ordering company and its qualities, as well as the quality of the product that they receive. In the context of this research, the product quality is the quality of food provided by the selected restaurant. Therefore, this section of the literature review surveys literature on food quality.

The main reason why restaurants operate is to sell food to their customers and provide enjoyable dining experience. Food quality may be defined as a complex concept that covers presentation, variety, healthy options, taste, freshness, and temperature of food (Namkung & Jang, 2007). American consumers have become savvier and expect nothing short of quality food that they would truly enjoy. Ha and Jang (2010) indicated that food quality is one of the key elements of customer's dining experience. Food quality has been examined as a part of the customers' perception of restaurants (Fu & Parks, 2001; MacLaurin & MacLaurin, 2000; Susskind & Chan, 2000), institutional food service (Kim et al., 2009), and OFD service (Suhartanto et al., 2019).

Food quality has been named as one of the factors that drive consumer intentions to choose a restaurant (Clark & Wood, 1999). In addition, food quality is mentioned as a critical element of customer satisfaction (Sulek & Hensley, 2004; Namkung & Jang, 2007; Ryu & Han, 2010; Ha & Jang, 2010), and it has been concluded that food quality is one of the key elements that affects guest satisfaction with restaurants. Therefore, the following hypothesis was forwarded for this study.

H5. There is a relationship between perceived food quality and customer satisfaction with online food ordering.

Satisfaction and behavioral intentions

A relationship between customer satisfaction and behavioral intentions has been long established in the marketing literature (Cronin & Taylor, 1992), the hospitality and tourism literature (Baker & Crompton, 2000; Chen & Chen, 2010), and the restaurant segment as well (Namkung & Jang, 2007; Suhartanto et al., 2019). In this study of online food ordering, behavioral intentions are considered from two perspectives: intentions to purchase from

a specific restaurant, and intentions to purchase from a specific food ordering company. Based on the relationship between satisfaction and behavioral intentions documented in the extant literature, the following hypothesis is proposed for this study:

H6. There is a relationship between customer satisfaction with online food ordering and customer behavioral intentions.

Methods

Instrument and measurement

The data for this study were collected using an online self-administered questionnaire built on the Qualtrics platform. The survey started with a qualifying question asking participants about their experience of ordering food online via such services as GrubHub, Seamless, Campusfood, Foodler, or Eat24 hours. Only those respondents who answered affirmatively to this question were permitted to take the survey. The first section of the survey contained questions pertaining to the participants' online food ordering experience. This part of the survey included questions inquiring about the number of times a study participant used online food ordering platforms, the name of the most recently used food ordering company, and the device that was used to place the order (e.g., desktop or mobile).

The second section of the survey asked participants to recall their most recent online food ordering experience and evaluate that experience with regard to perceived food quality, perceived control, service convenience, customer service, service fulfillment, satisfaction, and future behavioral intentions. The measurement items for these variables were adapted from previous studies and were assessed on a seven-point Likert scale, anchored at 1 – strongly disagree to 7 – strongly agree. Perceived food quality was measured using five items adapted from Namkung and Jang (2007). The scale did not include item #6 from the original scale of Namkung and Jang (2007). This item was concerned with the temperature of serving food, which is a factor that is challenging to control when food is being delivered to consumers instead of being served at a restaurant. The e-SELFQUAL scale (Ding et al., 2011) was used to measure perceived control, customer convenience, customer service, service fulfillment, and satisfaction. Since food delivery involves two players (an online food ordering company and a restaurant preparing the food), behavioral intentions were assessed from these two perspectives: intentions to use the chosen online food ordering company again, and intention to order food from the chosen restaurant again.

The third section collected demographic information about the study participants. This part included such questions as respondents' gender, age, level of education, and annual household income. The survey concluded with the thank-you statement and a special code to be inserted on Amazon's Mechanical Turk (MTurk) to receive payment for participation in the study.

Data collection

The data were collected using MTurk, a crowdsourcing website that has been gaining popularity for data collection in research (Buhrmester et al., 2011; Hauser & Schwarz, 2016; and Shank, 2016). An online data collection method was deemed suitable to the

purpose of this study because the major focus of this research is online food ordering, which means that qualified participants should have access to the Internet and be skilled in using online resources. The choice of MTurk as the data collection platform was driven by previous research that has shown that MTurk allows for reliable data collection with diverse (Buhrmester et al., 2011) and attentive samples (Hauser & Schwarz, 2016).

First, the instrument was piloted on MTurk to check for clarity and scale reliability. Based on the 60 responses collected at the pilot stage, the majority of the scales exhibited the desired level of reliability by passing the 0.7 Cronbach's alpha threshold (Hair et al., 2010). Only the service convenience scale with Cronbach's alpha of 0.662 fell slightly below the expected level of reliability, but was kept unchanged in the survey given the marginal discrepancy of the scale reliability measure with the abovementioned threshold of 0.7.

Second, the main stage of data collection began once the reliability of the measurement scales was confirmed. Based on the number of measurement items included in the scales (25), the study aimed to obtain at least 250 responses to test the proposed hypotheses (Hair et al., 2010). Since the survey was not modified after pilot testing, the data collected at two stages were merged for final analysis.

Findings

A total of 690 responses were collected via MTurk during the two stages of data collection. Out of these, 51 surveys were not completed, and, therefore, were excluded from data analysis. Among the remaining 639 completed responses, 287 (45%) have not used the food ordering companies, leaving 352 (55%) responses in the dataset. At the data cleaning stage, the data were also screened for unreasonably short survey completion times and outliers. The final sample used for the model testing included 303 (43.91%) fully completed usable responses.

Demographics

The sample was about equally represented by males (50.2%) and females (49.8%). The most frequently reported age category was 21–29 years (38%), followed by 30–39 years (35.3%), and 40–49 years (15.5%). The majority of the study participants had obtained some college or an undergraduate degree (76.9%). About half of the sample (50.2%) used online food delivery services one to four times within a year, and the most frequently utilized website was GrubHub (57.3%). Please refer to Table 3 for a complete demographic profile.

Hypotheses testing

The proposed model was tested using partial least squares structural equation modeling (PLS SEM). PLS SEM is recommended for studies that aim for theory development and prediction (Hair et al., 2011), which is the case of this research. This study looks at the development of a theoretical model that would predict customer satisfaction and behavioral intentions toward OFD services. This model was tested using WarpPLS 6.0. The

Table 3. Respondent demographic characteristics.

Demographic characteristic	%	Demographic characteristic	%
Gender		Household annual income	
Male	50.2	<\$40,000	37.0
Female	49.8	\$40,000 to \$59,999	18.8
Age		\$60,000 to \$79,999	22.8
18–20	3.0	\$80,000 to \$99,999	12.5
21–29	38.0	\$100,000 to \$149,999	5.9
30–39	35.3	>\$150,000	3.0
40–49	15.5	Food delivery in last year	
50–59	6.9	1–4 times	50.2
60–69	1.0	5–10 times	23.4
>70	0.3	11–15 times	13.2
Education		16–20 times	8.3
Less than high school	0.3	21–25 times	1.3
High school	7.6	26 times or more	3.6
Some college	38.0	Most recent food delivery service used	
Bachelor's degree	38.9	GrubHub	57.3
Graduate degree	15.2	Seamless	5.0
Living with significant other(s)		Campusfood	3.6
Yes	68.9	Foodler	2.3
No	31.1	Eat24 hours	5.6
		Uber Eats	13.9
		Other (please specify)	12.3

N = 303

following sections describe the evaluation of the measurement model first, and then proceed to the structural model.

Measurement model

Model evaluation started with confirmatory factor analysis (CFA) and assessment of factor loadings, model reliability, and validity. The results of CFA revealed that the Food Quality measurement item #3 (“The restaurant I ordered from offers healthy options”) had high cross-loadings on other constructs, and, therefore, was excluded from analysis. The model was rerun after removing the item. In the re-specified model, all observed factor loadings ranged from 0.731 to 0.935 (please see Table 4).

Construct reliability was confirmed using measures of composite reliability and Cronbach’s alpha, all of which were above the recommended threshold of 0.7. Convergent validity was established by means of assessing the average variance extracted (AVE) for each construct. The values of AVE ranged from 0.656 to 0.866, thus confirming convergent validity of the latent constructs used in the model.

Next, the study looked at the discriminant validity of the model, which was evaluated by means of examining cross-loadings and Fornell-Larcker criterion (Hair et al., 2011). The discriminant validity was supported by each item’s loadings being higher than any of the cross-loadings. Similarly, correlations among latent variables were lower than square roots of AVE (see Table 5). Therefore, both evaluation methods supported discriminant validity of the model.

Structural model

The evaluation of the structural model revealed that the model explains 60% of the variance in satisfaction and 70.5% of the variance in behavioral intentions with a strong degree of predictive relevance ($Q^2_{\text{Sat}} = 0.582$, $Q^2_{\text{BI}} = 0.702$) (Hair et al.,

Table 4. Assessment of factor loadings, reliability, and convergent validity.

	Factor Loadings	CR	Cronbach's α	AVE
<i>Food Quality</i>		0.884	0.824	0.656
Food presentation is visually attractive	0.744			
The restaurant I ordered from offers a variety of menu items	0.837			
The restaurant I ordered from serves tasty food	0.841			
The restaurant I ordered from offers fresh food	0.815			
<i>Control</i>		0.880	0.796	0.710
I know what to expect at each step of ordering food online	0.866			
I know how long it takes to complete a transaction	0.835			
I know what information will be provided on each page	0.826			
<i>Convenience</i>		0.853	0.741	0.661
I found registration convenient	0.731			
I found it convenient to change items in the shopping cart	0.867			
I found it convenient to update my order	0.834			
<i>Customer service</i>		0.940	0.903	0.838
Customer service is easy to access	0.900			
Customer service shows sincere interest in solving problems	0.912			
Customer service is responsive	0.935			
<i>Service fulfillment</i>		0.907	0.863	0.710
I get what I ordered	0.880			
The order is delivered as promised	0.868			
The final price reflects the true value	0.769			
The product is presented accurately on the site	0.849			
<i>Satisfaction</i>		0.938	0.917	0.751
I am satisfied with the quality of food that I ordered	0.833			
It was the right thing to purchase on the site	0.881			
I have truly enjoyed purchasing from the site	0.884			
My choice to purchase from the site is a wise one	0.895			
I am satisfied with an online/mobile ordering process from a food delivery company	0.836			
<i>Behavioral intentions</i>		0.928	0.846	0.866
I will order food delivery from this restaurant again	0.931			
I will use this food delivery company again	0.931			

Note. CR – composite reliability, AVE – average variance extracted

Table 5. Fornell-Larcker criterion.

	Food Quality	Control	Convenience	Customer Service	Fulfillment	Satisfaction	BI
Food Quality	0.810						
Control	0.668	0.843					
Convenience	0.560	0.669	0.813				
Customer Service	0.519	0.498	0.584	0.916			
Fulfillment	0.799	0.715	0.593	0.470	0.843		
Satisfaction	0.710	0.609	0.505	0.484	0.709	0.866	
BI	0.630	0.487	0.374	0.346	0.601	0.838	0.931

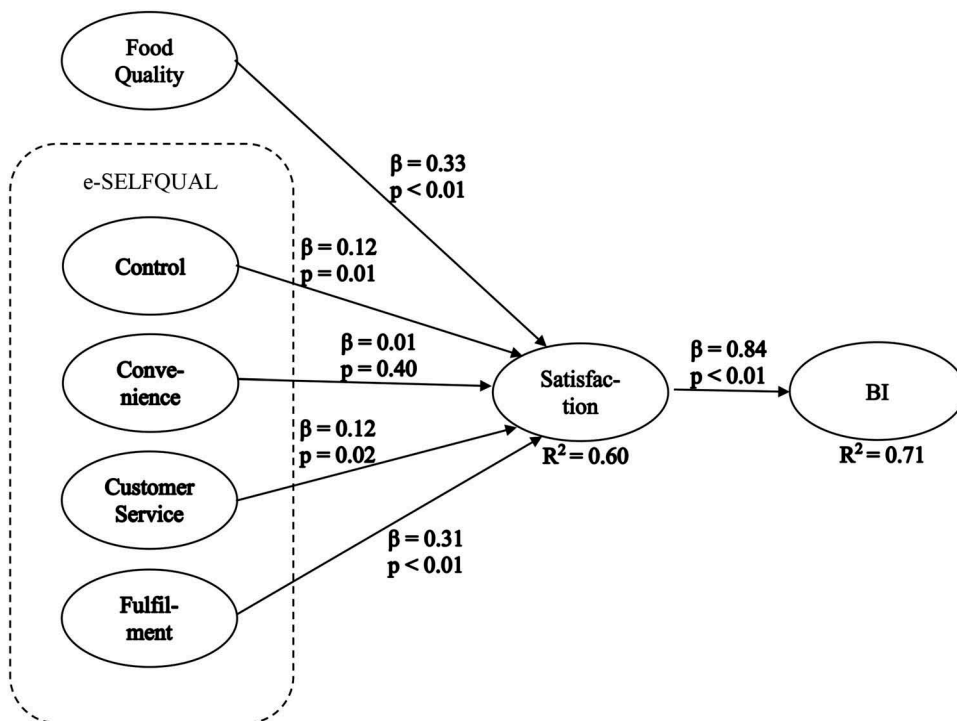
Note: square roots of AVE on the diagonal, correlations under the diagonal.

2017). All path coefficients except the path from Convenience to Satisfaction were statistically significant. Among all statistically significant relationships, the one between Control and Satisfaction, as well as the one between Customer Service and Satisfaction, exhibit weak effects ($f^2 = 0.075$ and $f^2 = 0.057$, respectively). The impacts of Food Quality on Satisfaction ($f^2 = 0.239$) and Fulfillment on Satisfaction ($f^2 = 0.221$) represent moderate effect, while the impact of satisfaction on behavioral intentions shows a strong effect ($f^2 = 0.705$). Please see Table 6 for path coefficients, p levels, standard errors, and effect sizes. Visually all results of the model testing are presented in Figure 1.

Table 6. Path coefficients and *p* values.

	Satisfaction	BI	<i>p</i>	S.E.	Effect size
Food Quality	0.335		<0.01	0.055	0.239
Control	0.123		0.015	0.056	0.075
Convenience	0.014		0.402	0.057	0.007
Customer Service	0.116		0.020	0.056	0.057
Fulfillment	0.310		<0.01	0.055	0.221
Satisfaction		0.840	<0.01	0.050	0.705

Note: BI – behavioral intentions.

**Figure 1.** Results of the model testing.

Conclusions and discussion

Conclusions

Despite a rapid increase in the last several years in OFD services, there is still a limited number of studies that take a detailed look into this area. In fierce restaurant competition, customer satisfaction depends on a variety of different factors, and restaurants hope that satisfied customers will return. Technology has been continuously influencing trends in the foodservice industry affecting how foodservice business is conducted and how customers chose to interact with a food service industry and food service professionals. Continued improvements in technology introduce business owners to lucrative opportunities, but also present challenges that may have a significant impact on customer satisfaction, behavioral intentions, and a financial position of the company. This specific study confirmed that food quality, control, customer service, and service fulfillment affect

customer satisfaction in OFD services, and that customer satisfaction affects behavioral intentions. Thus, this paper identified the factors that influence both customer satisfaction and behavioral intentions, and, therefore, contributed to the industry practice and existing, but rather limited, research in the food delivery area.

Theoretical contribution

This study investigated customer intentions to use OFD services from the ‘service quality – satisfaction – behavioral intentions’ approach that is in line with the contingency framework (Anderson & Srinivasan, 2003). While these relationships have been already explored in the literature, the study makes several theoretical contributions to the growing body of literature on OFD adoption. These contributions are presented and discussed below.

The model proposed in this research demonstrated a strong degree of predictive relevance, and explained 71% of variance in behavioral intentions and 60% of variance in satisfaction with OFD. By using different theoretical foundations, prior research was able to predict 48% of variance in behavioral intentions toward OFD services (Yeo et al., 2017), and 63% of variance in intentions to use the OFD application (Roh & Park, 2019). Therefore, this study provided a contribution to the body of knowledge by presenting a better predictive model compared to the studies documented in the literature.

While the research model tested by Suhartanto et al. (2019) also relied on evaluation of food quality and e-service quality, it was able to explain 39% in variance of customer loyalty toward OFD, and 52% of variance in satisfaction. It seems that focusing the outcome variable on intentions to use OFD services, instead of a broader concept of loyalty, this study was able to increase predictive power of the model. In addition, the model developed in this study was also able to demonstrate an increase in the ability to predict variability in customer satisfaction.

Building on the scales developed in previous research, this study adapted existing measures of behavioral intentions, satisfaction, and e-SELFQUAL to the context of OFD services. Behavioral intentions of using OFD services were designed to include both intentions toward the platform, and intentions toward ordering from a selected restaurant. The adapted scale demonstrated strong reliability and validity measures, and may be recommended for inclusion in future studies on OFD services.

Prior academic literature suggests that the quality of food is one of the main components of customer satisfaction in a restaurant setting. According to the findings of this study, food quality has a positive impact on OFD satisfaction, and that is consistent with prior studies (e.g., Ha & Jang, 2010; Haghighi et al., 2012; Namkung & Jang, 2007; Ryu & Han, 2010; Suhartanto et al., 2019; Sulek & Hensley, 2004).

Another contribution of this study is in evaluating OFD services from the perspective of e-self-service, and adapting the e-SELFQUAL scale (Ding et al., 2011) to the context of OFD research. All dimensions of the scale were transferred to the new context successfully, exhibiting high reliability and validity measures. Prior studies on OFD adoption did not consider dimensions that were included in the current research. Therefore, this study presented a new perspective on evaluating OFD services and their use.

Consistent with prior research (Ding et al., 2011), the dimensions of control, customer service, and fulfillment revealed statistically significant relationships with satisfaction.

Interestingly, convenience was not identified as one of the statistically significant predictors of customer satisfaction with OFD. It appears counter-intuitive that customers would not want the ordering service to be convenient. Such findings may be potentially explained by the ability of the online food ordering companies to provide a convenient ordering process, with easy online registration, selection, changes, and order placement. It may be that customers do not experience any variability on this factor due to the advanced web design of the companies offering online food ordering. This suggestion is supported by the data collected for this study, where customers reported high evaluation of the OFD service convenience ($M = 6.08$, $SD = 1.068$).

Theoretically, the inconsistencies in results with regard to the convenience variable may be explained by different approaches to operationalizing and measuring this construct. The current study viewed OFD as a self-service process and measured convenience through the assessment of the process of registration and updating the order. In the context of OFD, Cho et al. (2019) evaluated convenience as the ability of the user to order food using OFD application at any time and at any location. While both approaches are in line with the overall concept of saving customers time and effort (Berry et al., 2002), they also highlight different aspects of evaluating convenience.

Practical implications

Overall, this study investigated the factors influencing customer satisfaction with online food ordering and future behavioral intentions to patronize the same food ordering company or restaurant. Such factors include food quality, fulfillment, customer service, and control. The results of this study may be useful for restaurants that would like to expand their customer reach by offering OFD or to reevaluate distribution channels that they are currently using for online food ordering. Also, online food ordering companies may use the results of this study to improve their own services and to enhance the restaurant selection process for inclusion on their websites.

Restaurant managers and chefs need to consistently monitor food quality in their restaurants in order to positively influence customer satisfaction. This is not an easy task due to the unique demands of customers. American customers have become more sophisticated in their food demand, and it is not uncommon for American customers to expect meals that are customized with respect to their dietary restrictions and personal preferences. This can make the work of restaurants harder, and due to no lack of restaurants in the U.S., a customer can easily switch to a restaurant next door. OFD services make exploration of different restaurant options easier for customers by presenting such information in one place. Therefore, it is important for restaurants to explore the ways to control food quality during the online food delivery. Restaurants should evaluate available solutions for preserving food presentation and temperature while in transit.

OFD platforms may improve their offerings by paying attention to control, customer service, and fulfillment aspects. Control that customers have while ordering the food is making things more convenient and gives customers a sense of security that they can influence the process of food ordering and outcome. This feeling is opposed to someone else being in control. Therefore, it may be suggested to OFD companies to make efforts regarding streamlining and simplifying the ordering process. In addition, a clear and

simple process description may assist with helping customers feel in control of the ordering process.

In most cases while placing an order online, individuals do not come in contact with customer service representatives unless something goes wrong. It is deemed necessary that representatives have to be easily accessible if customers experience an issue with either placing an order or the delivery of quality food. Technology offers different approaches to providing outstanding customer service. Such options may include integrating a call button into the mobile application, or making it easily visible on the website, making the support e-mail address easily available, or integrating a chatbot into the application, or a website.

Fulfillment is another important quality for online food ordering companies. Customers expect to receive what they ordered and paid for. Wrong food items that appear on a doorstep cannot be promptly remade due to a geographical distance. It is critical for individuals who prepare the order to pay attention to details when it comes to meal delivery. It is not easy to remake a dish when you are far away from the restaurant's kitchen.

Future research directions

It is important to note that this study was conducted in the U.S. and performing a similar study in other countries can generate different results that can be influenced by different cultural, societal, and business norms. The researches collected data mostly on people who used service of GrubHub and answers of respondents can mostly reflect on GrubHub services. Given that the model proposed and tested in this study explains 60% of the variance in satisfaction and 71% of the variance in behavioral intentions, future research may explore additional factors that would contribute to explaining additional variance in satisfaction with online food ordering and customer behavioral intentions.

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