Consumers' intentions to use online food delivery systems in the USA

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Abstract

Purpose – The recent development of online food delivery systems (OFDS) consolidated the restaurant industry's representation in the electronic distribution landscape. The purpose of this study is to examine consumers' intentions to use OFDS.

Design/methodology/approach – A comprehensive structural model was developed based on UTAUT2 and extended the model with three additional constructs: impulse buying tendency, congruity with self-image and mindfulness. Data were collected from 605 US respondents. Confirmatory factor analysis and structural equation modeling were used to test the model.

Findings – Performance expectancy was the strongest predictor of intentions to use OFDS, followed by congruity with self-image. Low-magnitude predictors included habit and mindfulness, while impulse buying tendency had a negative impact on intentions to use OFDS.

Research limitations/implications – The study validates a comprehensive yet parsimonious conceptual model that explains consumers' intentions to use OFDS. The model brings together constructs that capture the essence of the online food ordering tasks and the consumers' cognitive processes that inform such tasks.

Practical implications – This study offers substantial practical implications for two types of practitioners: OFDS developers and restaurants and provides a mapping of the factors influencing consumers' intentions to use OFDS.

Originality/value – This study provides a first theoretical perspective on consumers' intentions to use OFDS, which have not been studied so far. Studying such intentions provides insight into consumers' adoption behaviors, which are critical to the success of OFDS.

Keywords Mindfulness, Restaurants, Electronic commerce, Technology adoption, Delivery systems

Paper type Research paper

Introduction

Conforming to a predominant 2010's trend, distribution using Online Foodservice Delivery Systems (OFDS) is becoming a significant part of restaurant industry distribution (Muller, 2018). In 2018, online ordering was the most liked method for ordering restaurant food for 45 per cent of the US population (Morning Consult, 2018). The OFDS market is growing with estimated revenues of $715m in 2019 and a forecast exceeding $950m by 2023 in the USA (Statista, 2019a) and $82bn globally (Statista, 2019b). While initial efforts to develop OFDS have emerged in mid 2010s (Grubhub Holdings Inc, 2019a), the recent advancements in integration/middleware have created opportunities for restaurants to integrate their point-of-sale software with today's OFDS (Grubhub Holdings Inc, 2019b). The resulting

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integration facilitated the aggregation of supply into OFDS that offer consumers various choices in terms of platforms, restaurants and product customization. Such features give OFDS the unique potential of radically disrupting the restaurant industry, illustrated by OFDS revenues that are expected to surpass the revenues from restaurants' direct-to-consumer deliveries in 2020 (Statista, 2019b).

Characterized by user interfaces that are grounded on the same generic retail principles as websites (Suhartanto *et al.*, 2019), the user experience that OFDS offer and the way the primary consumer task of food ordering is carried out require unique consumer behaviors that are substantially different from those used on typical retail websites. While general consumer behavior on retail websites has been explained in prior research, consumers' behavior relative to OFDS remains unknown to date. Understanding such behaviors helps to explain how OFDS can become successful permanent hospitality actors. Most importantly, as OFDS are generally commission-based, their success is entirely dependent on consumers' adoption. However, despite the potential ramifications of the mass adoption of OFDS and the meritorious findings of the scarce previous research (Cho *et al.*, 2019; Suhartanto *et al.*, 2019; Yeo *et al.*, 2017), there is no systematic program of research or study that has examined consumers' adoption of OFDS in the USA to date, marking a critical lacuna.

Indubitably, OFDS are poised to cause substantial disruption to the distribution system of US restaurants (Cho *et al.*, 2019) and other industries (Statista, 2019b). By design, OFDS deprive consumers of a legacy element of foodservice consumption: dining in a public environment of the restaurant (Jeong and Jang, 2016). Yet, as more than 80 per cent of the orders are placed from home (Hirschberg *et al.*, 2016), OFDS facilitate the reconstruction of this experience within consumers' residences where the success of a dining episode is no longer conditioned by the legacy elements of restaurant service (e.g. atmospherics, server interactions and appearance), but rather by a combination of familiar home-related elements (e.g. socialization, combination of food and beverages from multiple vendors). While the general adoption literature provides insight into the factors influencing consumers' intentions to purchase such digitized experiential products such as customizable hotel stay experiences (Morosan and DeFranco, 2019), it does not offer insight into purchasing hospitality products that can be digitized on the web while being reconstructed at the consumer's residence (Correa *et al.*, 2019), marking a second research lacuna.

The types of products being sold using OFDS are unique: highly perishable and heterogeneous (Kotler *et al.*, 2016), thus adding a layer of complexity to consumers' purchasing decisions and the purchasing environment. First, OFDS aggregate supply from a large variety of restaurants with different degrees of brand equity and awareness among consumers (Duncan, 2019), which requires consumers to undergo learning processes that inform their purchasing behaviors (Suhartanto *et al.*, 2019). Second, fulfillment time causes the degradation of certain organoleptic properties of the purchased products. However, such degradation is different from one type of product to another (e.g. a salad may lose its properties faster than a pizza during a relatively long delivery during the rush hour). Thus, consumers are likely to undergo highly involving cognitive processes that require a state of permanent awareness throughout their purchasing experience. Yet, there is no evidence in the literature that documents the adoption of systems delivering products where consumers have to go through such highly involving and complex decisions (Bujisic *et al.*, 2014), marking a third research lacuna.

Addressing the three research lacunae simultaneously, the goal of this study is to examine US restaurant consumers' intentions to use OFDS based on antecedents that fully capture the nature of consumers' food ordering task. To this end, this study validates a

conceptual model built on the classic technology adoption theory that provided system perception constructs (i.e. performance expectancy) and consumer inherent characteristics associated with adoption (e.g. habit) (Venkatesh *et al.*, 2012). This theoretical foundation was augmented with constructs describing the state of mind facilitated by the characteristics of the purchasing environment (Rook, 1987) or consumer characteristics (e.g. impulse buying tendency) (Wells *et al.*, 2011), congruity with self-image (Jeong and Jang, 2018) and constructs describing the cognitive processes necessary to make a risk-free decision when buying a product such as a food item (i.e. mindfulness) (Sun *et al.*, 2016). To accomplish its goal, this study follows two specific objectives:

(1) to examine the differential role of perceptions and consumer characteristics in influencing intentions; and

(2) to ascertain the multidimensional role of mindfulness in stimulating intentions.

Review of literature

Theoretical foundations

The study's conceptual model was designed to fulfill three important criteria:

(1) provide a theoretical base that comprehensively captures the unique context of the food ordering task;

(2) provide a sufficiently broad scope by including constructs that captures the unique nature of products sold via OFDS while addressing the three aforementioned research lacunae; and

(3) retain parsimony.

According to the first criterion, this study developed a conceptual model that revisited the legacy adoption theory - Unified Theory of Acceptance and Use of Technology (UTAUT2) (Venkatesh *et al.*, 2012). UTAUT2 was revisited by retaining two original constructs – performance expectancy and habit - and adding three constructs (impulse buying tendency, congruity with self-image and mindfulness) to investigate consumers' intentions to use OFDS. UTAUT2 was the preferred theoretical framework for three reasons:

(1) it has been validated as a strong framework for predicting behavioral intentions in multiple service contexts (Morosan and DeFranco, 2016a);

(2) it captures the specific task-technology environment of consumer-oriented tasks (Morosan and DeFranco, 2016a); and

(3) it lends itself to extension via constructs capable of providing comprehensive yet parsimonious illustrations of system adoption.

Of the seven independent variables of the original UTAUT2, only two were retained. Performance expectancy was retained because it remains the most fundamental antecedent of adoption (Venkatesh *et al.*, 2003). Habit was retained because of its ability to explain adoption of IS where the consumers are familiar with the task from other contexts (e.g. ordering food from restaurants, shopping online for other products) (Okumus *et al.*, 2018). Five variables that were originally included in UTAUT2 were not retained in this study because they could not capture the motivational fabric of using OFDS while preserving parsimony. Specifically, effort expectancy was not retained as generally OFDS are designed with intuitive interfaces, which guide the consumers through the purchasing task in ways that are similar to other retail environments. Social influence was not retained as generally

ordering via OFDS is already influenced by the social interactions that naturally occur within the consumption party (e.g. couple/family/friends, coworkers), regardless of which member of the group places the order. Facilitating conditions was not retained because of the ubiquity of the OFDS and restaurant products in the US market. Hedonic motivation was not retained as the current model includes the concept of congruity with self-image, which provides a more comprehensive basis of a consumer's self-image evaluations (Stets and Burke, 2005). Finally, price value was not retained because there is no cost associated with the use of OFDS, as intended in the original model (Venkatesh *et al.*, 2012).

While keeping two independent variables from the UTAUT2 represents a substantial modification of the original model, this new theoretical foundation retains the same perception-behavior path that has characterized this model since inception and allows it to explain adoption behavior based on users' perceptions and consumer characteristics (Benbasat and Barki, 2007). The retained path between performance expectancy and intentions remains fundamental to IS adoption because it is present in one form or another in a variety of theoretical models, beyond the UTAUT (Jahanmir and Cavadas, 2018). In particular, this path reflects the primary cognitive processes that evaluate the ability of a system to facilitate the task (Venkatesh *et al.*, 2003) and stimulate users' evaluations of systems when facing a task (Venkatesh *et al.*, 2012). However, habit reflects the users' automatic behavior tendency that impact IS use (Lymayem *et al.*, 2007) and explains motivations that are not necessarily thoroughly elaborated by users but rather automatically evoked in certain familiar contexts (Escobar-Rodríguez and Carvajal-Trujillo, 2014) (e.g. when sufficient similarity exist with other routine tasks). Thus, based on the contrasting nature of the two variables, performance expectancy and habit were used as a core UTAUT-based foundation without compromising parsimony; therefore, this model allows to address the first research lacuna.

In line with the second and third criteria, this study incorporated additional constructs to address the three lacunae while retaining parsimony. UTAUT2 was reconstructed by the addition of three concepts based on the thesis that this particular extension from UTAUT2 must comprehensively and parsimoniously capture the task-technology environment of OFDS. While the literature offers a rich variety of constructs that could influence intentions to use a new system, the unique environment of OFDS called for three types of constructs.

First, as OFDS are geared toward persuading consumers to engage in target behaviors in the absence of face-to-face communication (Cho *et al.*, 2019), this model needs a construct that reflects consumers' constant mind-changing as a result of discovering new information available about or on OFDS. To capture this critical aspect, impulse buying tendency (Wang and Tsai, 2017) was added to theoretical foundation. Impulse buying reflects consumers' buying behaviors that occur suddenly (Piron, 1991). As restaurants have begun to shift their focus to online delivery options (Morgan Stanley Research, 2017), OFDS started to offer various options such as multiple product selections, different time ranges for delivery, personalization and online payments (Hirschberg *et al.*, 2016). Simultaneously, their advertising power has increased. As a result, the way consumers make their decisions to purchase using OFDS is different than in other online retail environments. For example, a critical aspect is the state of relative hunger or consumers' anticipation of the meal. This may precipitate the decision-making process, thus creating situations when consumers may spontaneously purchase food.

Second, recent data show that certain consumers (e.g. younger and urban) are likely to be attracted more by OFDS (Statista, 2019b). Therefore, recognizing the intrinsic motivations that can lead to OFDS utilization, this theoretical foundation required a construct reflecting such motivational fabric and added congruity with self-image to the core foundation.

Congruity with self-image reflects the level of match between the consumers' perception of a brand or experience with their identities (Luna-Cortés *et al.*, 2019). The design of OFDS is in line with the design of other similar retail platforms, which could be found appealing only by certain segments of consumers. Thus, it is possible that consumers who view themselves as typical users of such systems to be attracted by OFDS. Such motivations may originate in the user interface characteristics (e.g. inherently intuitive) but also in task characteristics (e.g. desire to try something new). Overall, the inclusion of impulse buying tendency and congruity with self-image positioned this conceptual model to address the second research lacuna.

Third, recent consumer behavior insight shows that consumers are not merely passive users of an IS; instead they like to interact with the system to maximize value in use (Tu *et al.*, 2018). Important elements of the use of IS include consumers' continuous awareness of the task and their continuous adaptation of their behavior to make the systems work for them in accomplishing the tasks (Pickert, 2014). Scholars' attention increased toward the consumer-oriented tasks in online shopping as a continuous process of using IS (Wang *et al.*, 2015). This is especially important in context where tasks – such as ordering via OFDS – are addressing needs that are situated at various levels within a consumers' hierarchy of needs (i.e. hunger as a physiological needs and customization of an online platform as self-actualization). Thus, to capture OFDS' interactive environment's influence on consumers intentions (e.g. modifying food items and adding tips for drivers) mindfulness was added to the core foundation (Thatcher *et al.*, 2018), which allows this conceptual model to address the third research lacuna.

Hypotheses development

Performance expectancy. Derived from the perceived usefulness construct of the original technology acceptance model (Davis, 1989), performance expectancy reflects the perception of a user that IS helps the user complete a task better than its rival systems (Venkatesh *et al.*, 2003). Performance expectancy has been validated as a strong predictor of intentions to use IS in various contexts, including hospitality (Okumus *et al.*, 2018). OFDS have been designed to facilitate food ordering task completion in lieu of or addition to traditional systems (e.g. direct phone or web ordering). Compared to phone ordering, consumers can check the information about multiple food items on a unified platform, therefore optimizing the task (Quevedo-Silva *et al.*, 2016). Compared to restaurants' websites, OFDS allow consumers to compare offers from multiple restaurants. Moreover, consumers can optimize ordering on OFDS by browsing information about future purchases without a task being imminent. This process enhances the information search phase of their purchasing, which can result in effective task completion. Based on the discussion above and the recent literature (Yeo *et al.*, 2017), the following hypothesis was developed:

H1. Performance expectancy is positively related to the consumers' intentions to use OFDS.

Habit. Habit reflects a relationship between a person's past and future behaviors (Kim and Malhotra, 2005). Habit has been validated as an antecedent of users' behaviors, especially when repetitive behaviors manifest in IS use (Limayem and Cheung, 2008). Thus, habit reflects consumers' continuous use of IS, in alignment with their satisfaction from previous purchasing experiences (Khalifa and Liu, 2007). Given the ubiquity of today's IS devices, consumers develop habitual use patterns (Jasperson *et al.*, 2005), which facilitates subsequent use. Most contemporary online retail environments are grounded in the same principles: guiding consumers through a linear path from information to decision-making,

purchasing and fulfillment. OFDS makes no exception. Consumers ordering a food item are guided by OFDS through this linear path, which enhances their learning effects and optimizes subsequent episodes of use. Corroborated with similar processes from other online retail environments (e.g. software, education and food service) (Correa *et al.*, 2019), the resulting habit can lead to intentions to use such systems in the future. Thus, it is expected that consumers' habits influence their intentions to use OFDS, according to the following hypothesis:

H2. Habit is positively related to the consumers' intentions to use OFDS.

Impulse buying tendency. Impulse buying reflects the tendency that leads consumers to spontaneously purchase a product (Chan *et al.*, 2017). In online shopping, various IS attributes (e.g. website quality) (Wells *et al.*, 2011) and value retained by shoppers (Chung *et al.*, 2017) were found to influence consumers' impulse buying tendencies, which can influence their intentions to purchase (Chung *et al.*, 2017). The value that consumers could retain can be assessed based on persuasive information/advertising in the retail environment. As advertising stimulates impulse purchasing (Madhavaram and Laverie, 2004), consumers who are impulse buyers may be tempted to use OFDS. Such behaviors may be exacerbated by the innate appetizing presentation of food items in retail and the urgency to eat. Moreover, impulsive consumers may purchase using OFDS based on browsing because OFDS offer intangible benefits that can stimulate purchasing (e.g. removing certain ingredients and creating a product bundle) (Sharma *et al.*, 2010). Therefore, characterized by persuasive information OFDS are environments where impulsive buyers can determine stimuli that can guide them from information to purchasing, therefore suggesting a relationship between impulse buying tendency and intentions to use OFDS:

H3. Consumers' impulse buying tendency is positively related to their intentions to use OFDS.

Congruity with self-image. Congruity with self-image reflects the match between the consumers' self-image and a brand or product image referencing the purchasing motivation (Sirgy and Su, 2000). Self-image congruity is important to OFDS as both the food service (Jeong and Jang, 2018) and IS literature (Carter and Grover, 2015) have recognized its role in influencing consumers' intentions. Specifically, an individual can attach himself/herself to an IS, which eventually integrates into his/her identity (Schwarz and Chin, 2007). OFDS reflect marketing strategies designed to attract specific segments of consumers, stimulating them to recognize the match between their self-image and the OFDS. Most importantly, the cognitive evaluation of the match between a consumer's perceived image of himself/herself and that of the OFDS that is characterized by novelty (e.g. new technology, disruptive business model, creating an identity with a third-party company that is not part of the legacy hospitality industry) could reflect a high level of match, which could result in intentions (Sirgy, 1982). Thus, consumers high in self-image congruity with OFDS could display high intentions to use OFDS:

H4. Consumers' congruity with self-image is positively related to their intentions to use OFDS.

Mindfulness. Mindfulness refers to individuals' awareness about the context and content of information (Langer, 1997). It is a condition of being open to use IS where individuals consider both details and features (Thatcher *et al.*, 2018). When being mindful, users are likely to consider various uses of IS (Roberts *et al.*, 2007), which is fundamental to

stimulating intentions to use IS (Sun *et al.*, 2016). Mindful users continuously scan the task environment to determine the best opportunities to interact with an IS (Thatcher *et al.*, 2018). Moreover, consumers' cognition when immersed in a task may influence their level of performance in task completion (Butler and Gray, 2006) because they adapt to new situations for accomplishing tasks (Teo *et al.*, 2017). Accordingly, consumers are likely to acknowledge the details and features of OFDS, which range from system design features (e.g. shopping cart management), to the mix of hard products (e.g. customization) and soft product features (e.g. rewards, coupons). For example, a consumer using an OFDS may see an option for a food item made from local ingredients. Changing the consumer's initial choice may result in an optimized task completion because the new choice can be more beneficial. The consumer can further optimize his or her purchasing task by applying coupons found on the OFDS. Thus, OFDS-mindful consumers are likely to develop intentions to use OFDS:

H5. Consumers' mindfulness toward OFDS is positively related to consumers' intention to use OFDS.

Mindfulness comprises four dimensions:

(1) alertness to distinction;

(2) awareness of multiple perspectives;

(3) openness to novelty; and

(4) orientation in the present (Thatcher *et al.*, 2018).

Alertness reflects the users' tendency to be aware of the differences between the way they are using an IS and the potential of that IS (Thatcher *et al.*, 2018). Users try to mitigate such differences by optimizing the way they interact with the system. OFDS provide conditions for consumers to reflect on the utilization of such systems compared to to the potential use by suggesting new features and products. Most commonly, such suggestions include invitations to try sponsored/recommended products, use coupons or subscribe to receive marketing material. Awareness of multiple perspectives reflects users' evaluations of the way they use various features of a system relative to the distinct value resulting from each potential use (Thatcher *et al.*, 2018). Users try to mitigate any differences by identifying innovative ways to use an IS, which could be beyond the scope of the design of the original system. OFDS-mindful consumers may attempt to identify innovative ways to interact with the systems. However, because the systems feature simple tasks (ordering food from a menu), OFDS are not likely to facilitate awareness of multiple perspectives in OFDS-mindful consumers; therefore, this dimension was not conceptualized.

Openness to novelty refers to being able to notice differences, contexts and curiosity compared to new features of specific IS. OFDS can offer consumers who are open to novelty new conditions for use such as additions to the traditional web-related foodservice or retail business models. For example, mindful users may optimize the value of using OFDS by pre-ordering, taking advantage of free sampling or scheduling off-peak hours delivery times. Moreover, users can use OFDS to gather information online and subsequently order over the phone or gather information about a restaurant by placing items in a shopping cart to later abandon it after learning about the pricing and then ordering by phone). Orientation in the present refers to being informed of outcome that is introduced by each process (Thatcher *et al.*, 2018). Specifically, orientation in the present reflects the level of consumer awareness of the implications of ordering food online. Therefore, OFDS-mindful consumers may display short behavioral sequences (e.g. items placed in shopping cart that are ordered

immediately, reacting to promotional cues) compared to other retail situations because of orientation in the present. Based on the above discussion, this study considers the multi-dimensional nature of mindfulness toward OFDS, according to the following hypotheses:

H5a. Alertness to distinction is a dimension of mindfulness toward OFDS.

H5b. Openness to novelty is a dimension of mindfulness toward OFDS.

H5c. Orientation in the present is a dimension of mindfulness toward OFDS.

Intentions to use an IS reflects users' responses (Fishbein and Ajzen, 1975) and have been extensively used in hospitality IS literature as replacements of actual behavior. Intentions are especially useful in contexts where the measurement of actual behavior is unfeasible (Morosan and DeFranco, 2016b). Their extensive utilization is grounded in the notion that intentions reflect an individual's most immediate motivation to perform an actual behavior.

The conceptual model of the study and its relationships are illustrated in Figure 1 below.

Methodology

Instrument development

An online instrument was developed based on established scales found in the published literature. The current study adapted the performance expectancy scale (5 items) and intentions to use OFDS (4 items) from Venkatesh *et al.* (2003). The scale for habit (4 items) was adapted from Venkatesh *et al.* (2012). The scale for congruity with self-image (3 items) was adapted from Antón *et al.* (2013), and the scale for impulse buying tendency (5 items) was adapted from

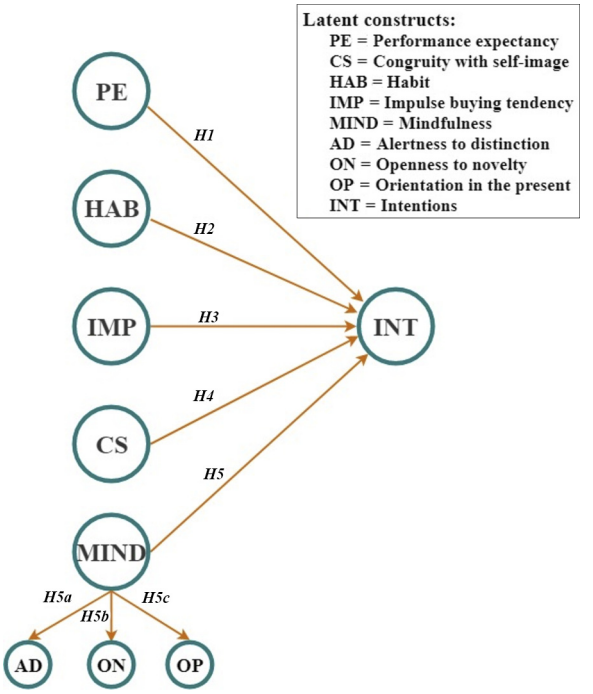

Figure 1.
Conceptual model and hypotheses

Verhagen and van Dolen (2011). The scale for OFDS-related mindfulness (9 items) was adapted from Thatcher *et al.* (2018). All measurement items were rated using Likert-type items, ranging from 1 = Strongly Disagree to 5 = Strongly Agree (Table III).

Instrument administration

A screening question was added to the instrument to confirm whether respondents have dined in a restaurant within 12 months prior to the study. Respondents who did not dine in a restaurant within the last 12 months were excluded. Demographic and behavioral questions such as the frequency of dining out, spending and income were added to the instrument. Respondents were asked to read a scenario that included a basic definition of OFDS and an explanation of how OFDS work. The Qualtrics platform was used to build and host the instrument.

The sample was acquired using the services of a global marketing panel firm. The firm has access to contact information from millions of consumers worldwide. For this study, a sample frame that describes the general consumer population of the USA (e.g. age, geographical spread) was used by the panel firm. The panel firm charged a set fee for each complete response. Therefore, the procedure of collecting the data involved several steps. First, a target sample size was determined, in line with the sample size requirements suggested by the literature for this type of analysis and instrument (Hair *et al.*, 2009). Given the cost per respondent charged by the panel firm, the target sample size was set at 600, which was deemed sufficient for this type of analysis and instrument (Hair *et al.*, 2009). Second, the panel firm sent invitations to their panelists to complete the survey based on the link to the instrument provided by the researchers. Third, as the respondents completed the instrument, the researchers used the live reporting tools available in Qualtrics to continuously monitor the data collection process and terminated the process when the sample reached (and slightly exceeded) 600 complete responses. Fourth, an analysis of the completeness of the data set was conducted and responses that were not complete were removed from the final data set.

Prior to the actual data collection, a pilot test was conducted following the same procedure. A subsample of 50 complete responses from individuals from the same sample frame was collected. During this test, several issues were monitored, such as time spent by respondents while completing the survey, whether there were any items that were consistently skipped, and the demographic structure of respondents. Upon confirmation that there were no problems with the way respondents completed the survey, the actual data collection was conducted in March 2019. The panel firm sent a total of 13,716 invitations to their panelists and 967 panel members participated in the study. After removing the responses containing heavily missing values, a total number of 605 valid responses (response rate = 4.4 per cent) were maintained for further analysis.

Results

Preliminary results

Multivariate normality was verified by a procedure recommended by Mardia (1970) using Mplus 8.0 (Muthén and Muthén, 2017). While all variables followed univariate normal distributions, multivariate normality was not established. Therefore, the subsequent analysis used a maximum likelihood estimator that is robust to deviations from multivariate normality (Muthén and Muthén, 2017). Respondents' demographic characteristics included gender, age, annual household income and the level of education (Tables I and II). Most respondents were female (71.7 per cent). The age structure of respondents was representative of the US population's age structure (U.S. Census, 2013). A total of 38.8 per

Characteristics	(%)
Gender	
Male	28.3
Female	71.7
Age	
24 or younger	2.4
25-29	6.3
30-49	33.1
50-59	22.3
60 or older	35.9
Income (annual per household)	
$50,000 or less	22.4
$50,001 - $100,000	38.8
$100,001 - $150,000	21.6
$150,001 - $200,000	10.1
$200,001 or more	7.1
Education (degrees completed)	
High School or equivalent	18.3
Bachelor of Science/Arts or equivalent	28.8
Graduate Degree (MS, PhD, Law, Med.)	32.6
Other	20.3

Table I. Demographic characteristics of respondents

Characteristics	(%)
Frequency of dining out	
1-4 times	13.5
5-8 times	15.2
9-12 times	8.6
More than 12 times	62.7
Spending for each person ($)	
Less than $10	0.8
$10-$20	20.5
$21-$30	10.3
$31-$40	6.2
$41-$50	5.9
$51 or more	56.4

Table II. Behavioral characteristics of respondents

cent of respondents had an annual household income between $50,000 and $100,000, and the majority of them graduated with at least a Bachelor's degree. Most respondents (62.6 per cent) had dined in the restaurant more than 12 times a month, and 56.4 per cent of respondents spend at least $51 per person in a typical restaurant outing.

Measurement model results

A confirmatory factor analysis (CFA) was conducted to assess the measurement model (Anderson and Gerbing, 1988) and establish convergent and discriminant validity using Mplus 8.0 (Muthén and Muthén, 2017) (Tables III and IV). CFA permitted the calculation of

Constructs and items	Composite construct reliabilities (Loadings)
Performance Expectancy (Venkatesh et al., *2003)*	0.924
PE1: Using online food delivery systems allows me to order my food more efficiently (than using other systems, such as ordering directly from the restaurant's website, calling the restaurant)	0.837
PE2: Using online food delivery systems would improve the quality of my food ordering process	0.878
PE3: Using online food delivery systems allows me to complete my food ordering process faster (than using other systems, such as ordering directly from the restaurant's website, calling the restaurant)	0.822
PE4: Using online food delivery systems would enhance the effectiveness of my food ordering	0.884
PE5: Using online food delivery services is useful for ordering food from restaurants	0.786
Habit (Venkatesh et al., *2012)*	0.947
HAB1: Generally, the use of online food delivery systems has become a habit for me	0.911
HAB2: I am addicted to using online food delivery systems	0.893
HAB3: I must use online food delivery systems	0.911
HAB4: Using food delivery systems has become natural to me	0.903
Impulse Buying Tendency (Verhagen and van Dolen, 2011)	0.927
IMP1: I often buy things spontaneously	0.824
IMP2: "Just do it" describes the way I buy things	0.850
IMP3: I often buy things without thinking	0.871
IMP4: "I see it, I buy it" describes me	0.897
IMP5: I buy things according to how I feel at the moment	0.789
Congruence with Self-image (Antón et al., *2013)*	0.941
CS1: I fit in with the typical image of a user of online food delivery system	0.916
CS2: I identify with the typical user of online food delivery systems	0.933
CS3: The image of the typical online food delivery system user reflects the kind of person I am	0.904
Mindfulness (Thatcher et al., *2018)*	0.972
Alertness to distinction	0.976
AD1: I find it easy to create new ways of using online food delivery systems	0.901
AD2: I am very creative when using online food delivery systems	0.920
AD3: I make many novel contributions to my food ordering through the use of online food delivery systems	0.912
Openness to novelty	0.939
ON1: I like to investigate different ways of using online food delivery systems	0.916
ON2: I am very curious about different ways of using online food delivery systems	0.893
ON3: I like to figure out different ways of using online food delivery systems	0.944
Orientation in the present	0.964
OP1: I often notice how other people are using online food delivery systems	0.858
OP2: I see the "big picture" of a food ordering when using online food delivery systems	0.854
OP3: I "get involved" when using online food delivery systems	0.924
Intentions (Venkatesh et al., *2003)*	0.925
INT1: I intend to use the online food delivery systems in the future	0.874
INT2: I will always try to use the online food delivery systems	0.889
INT3: I will recommend to others to use online food delivery systems in the future	0.876
INT4: Online food delivery systems would be among my favorite technologies	0.898

Table III.
Reliability and validity

	Performance expectancy	Habit	Impulse buying tendency	Congruity with self-image	Mindfulness	Intentions
Performance Expectancy	0.709					
Habit	0.413	0.818				
Impulse Buying Tendency	0.228	0.526	0.717			
Congruity with Self-image	0.523	0.728	0.378	0.842		
Mindfulness	0.476	0.797	0.548	0.716	0.921	
Intentions	0.733	0.694	0.346	0.803	0.728	0.782

Table IV.
Discriminant validity

Note: The underlined values on the diagonal represent the average variance extracted (AVE) values for each latent construct, while the values below the diagonal represent squared inter-construct correlations

several common model fit indexes. The indexes had the following values: chi-squared (X^2) (387) = 860.164 ($p < 0.001$), normed-chi-squared (X^2/d.f.) = 2.22, comparative fit index (CFI) = 0.97, Tucker-Lewis Index (TLI) = 0.96 and Root Mean Square Error of Approximation (RMSEA) = 0.049. Overall, the indexes indicated good model fit (Hair *et al.*, 2009). It was necessary to estimate the factor loadings for each construct to establish reliability and validity (Hair *et al.*, 2009). The composite construct reliabilities were calculated for each construct, and they were found to be greater than 0.9 (Table III); therefore, it was concluded that reliability was established (Hair *et al.*, 2009).

All factor loadings must be greater than 0.7 and be significant to establish convergent validity (Hair *et al.*, 2009). Average variance extracted (AVE) values were calculated for each latent construct. They were all greater than 0.5, indicating acceptable convergent validity (Fornell and Larcker, 1981). Discriminant validity was assessed by comparing AVE values and the squared correlations of each pair of latent constructs (Fornell and Larcker, 1981). All constructs' AVE values exceeded the squared correlations of pairs of latent constructs, except for two cases. Specifically, the squared correlations between performance expectancy and intentions and between congruity with self-image and intentions were determined to be within 3 per cent from one of the corresponding AVE values. Despite this result, discriminant validity was still able to be established in this study.

Research model results

Structural equation model (SEM) with a maximum likelihood estimator robust to deviations from multivariate normality was conducted to assess the fit of the research model and provide data for hypothesis testing (Muthén and Muthén, 2017) (Figure 2 and Table V). The model had acceptable fit to the data within the recommended thresholds (Hair *et al.*, 2009) as follows: X^2 (386) = 786.186 ($p < 0.001$) and X^2/d.f. = 2.03, CFI = 0.97, TLI = 0.97, and RMSEA = 0.045. All indexes showed appropriate fit (Bagozzi and Yi, 1988). The results of the research model analysis provided support for all hypotheses in the predicted directions except for one hypothesis (*H3*) (Table V).

Discussion

Performance expectancy was determined to be the strongest predictor of intentions ($\gamma = 0.399$, $p < 0.001$), therefore providing support for *H1*. This finding outlines the notion that the design of a system and its ability provided to consumers to complete a task is the most important antecedent of intentions, even in contexts where the task is straightforward and relies on legacy processes such as ordering food online. Although this result is

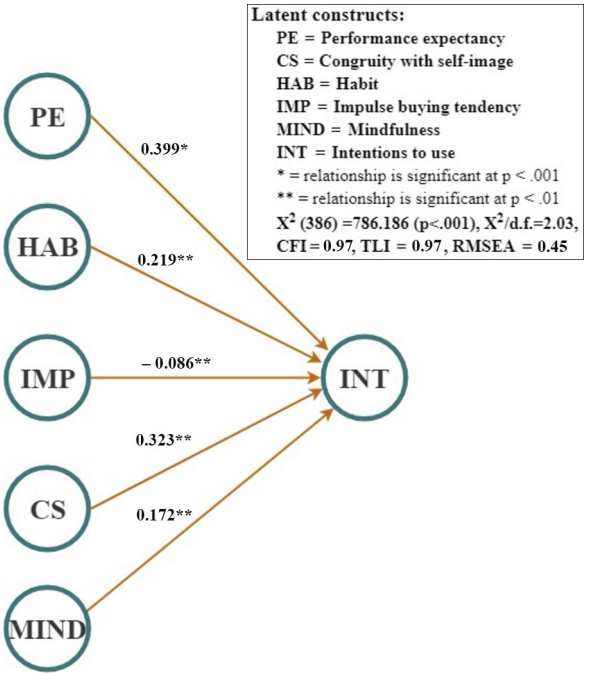

Figure 2.
Model testing results

Latent variables		Path coefficient	*p*. value	Information
H1	Performance Expectancy→Intentions	0.399	$p < 0.001$	Supported
H2	Habit→Intentions	0.219	$p < 0.01$	Supported
H3	Impulse Buying Tendency→Intentions	−0.086	$p < 0.01$	Not Supported
H4	Congruity with Self-image→Intentions	0.323	$p < 0.001$	Supported
H5	Mindfulness→Intentions	0.172	$p < 0.01$	Supported

Table V.
Path coefficients

fundamentally supported by the literature (Morosan and DeFranco, 2016a), the magnitude of the relationship is relatively high. This may be explained by the existence of other factors that may influence consumers' intentions relative to system performance.

The relationship between habit and intentions was validated ($\gamma = 0.219$, $p < 0.01$), thus providing support for *H2*, i.e. consumers' habit plays an important role in shaping their intentions to use OFDS. This is an important finding, and it may be attributed to the fact that habit is facilitated by context and generally leads to rewards (Duhigg, 2013). In this case, utilizing OFDS to obtain advantages such as dining without the experience in the actual restaurant, or combining food items with other items that the consumer has at home could be important benefits. Moreover, this result is important as consumers who are encountering an unknown system will eventually rely on the same habits that have driven their behavior consistently over time (Neal *et al.*, 2013). As such habits may be activated by cues (Renaud *et al.*, 2019), the routine of using IS for a variety of daily tasks could result in the development of habits that include those of using OFDS for food ordering.

Impulse buying tendency was found to have a negative relationship with intentions to use OFDS. While the relationship was found to be significant ($\gamma = -0.086$, $p < 0.01$), *H3* could not be validated in its predicted direction. While low in magnitude, this relationship illustrates the rather cognitive manner in which OFDS behaviors develop. Although restaurants have always engaged in marketing strategies targeting impulsive consumers or grounded in the idea that consumers driven by their hunger needs could expedite their access to food, such strategies do not necessarily result in OFDS use. It is also possible that certain impulsive consumers could be driven by their impulses to order food, but likely to select other fulfillment options such as immediately going to a restaurant, thus by-passing critical sub-decisions pertaining to the task of ordering using OFDS (e.g. choosing an OFDS, then a restaurant, food item, and delivery method). This reinforces findings from tourism literature where tourists set up mental budgeting constraints as coping strategies because they are tempted to acquire unplanned products (Brida and Tokarchuk, 2017).

Not surprisingly, the relationship between congruity with self-image and intentions was found to be strong and positive ($\gamma = 0.323$, $p < 0.001$), supporting *H4*. That is, consumers high in congruity with self-image are likely to use OFDS. In other words, the design and marketing associated with OFDS are important in stimulating consumers to evaluate the functionality and image of such systems, which act as catalysts for shaping consumers' intentions. This could be explained by the strong relationships between consumers' self-concept and the attributes of commercial artifacts (Belk, 1988) that facilitate the development of behavioral paths toward a specific artifact. Moreover, this result, together with the strong relationship between performance expectancy, reinforces the notion that the design of OFDS is the most critical aspect in the adoption of such systems.

The multidimensional construct of OFDS-mindfulness was also to be a significant predictor of intentions to use ($\gamma = 0.172$, $p < 0.01$) providing support for *H5*, although the magnitude of this relationship was relatively low. This finding may be attributable to the fact that the task of purchasing food products using OFDS may bring substantial benefits to consumers as the process of ordering stimulate consumers to pay attention to the present experience (Bishop, 2004) when using such systems. Moreover, the three dimensions of mindfulness were found to explain the second order construct of mindfulness (path coefficients of 0.975, 0.940 and 0.961, $p < 0.001$), therefore supporting *HH5a*-c. This validation provides important insight into explaining the way consumers evaluate their interactions with OFDS. Moreover, this result demonstrates that consumers who are continuously aware of the way they interact with OFDS are likely to strengthen their intentions to use OFDS.

It is important to recognize the contrasting effect of habit and mindfulness. This result reflects the blend between cognitive and heuristic elements that characterizes most restaurant purchases. This could be attributable to the fact that many restaurant purchases are strongly influenced by consumer characteristics and preferences, which develop over time, and are difficult to change as a result of switching from brick-and-mortar to online platforms. Yet, given the relative novelty of OFDS and the learning curve required by restaurants to provide product information on OFDS, consumers can develop a state of being fully present in the experience of ordering (Bishop, 2004) that is based on attention that is sustained over time (Parasuraman, 1998).

Implications

Theoretical implications

As the first study to examine the intentions to use OFDS of restaurant consumers in the USA, this study brings several important theoretical implications. Addressing the first

research lacuna, this study developed a model that brought together multiple constructs from IS and consumer psychology that comprehensively, yet parsimoniously, explained intentions to use OFDS. As such, this study conceptualized a task-technology environment characterized by unique tasks, which only recently have become part of the online distribution landscape. While most adoption studies focused on purchasing tasks that reflect products that can be consumed in the same manner regardless of how they were purchased, this study occupies a unique position within the IS literature because it focuses on the food product ordering task, which is characterized by unique attributes. The uniqueness of such tasks is illustrated by consumers' inherent constraints when ordering, variety of information, innate tastes for specific food products and the reconstruction of the social consumption experience. Ultimately, this study illustrated how such tasks can be conceptualized, advancing the literature in IS.

This study provides insight into consumers' behavior *vis-à-vis* digitized experiential restaurant food products sold online. Addressing the second research lacuna, this study explained the roles of impulse buying tendency and congruity with self-image, which comprehensively illustrate the purchasing environment in OFDS, rather than the genetic web-based e-commerce. While the negative effect of impulse purchasing tendency on intentions was somehow surprising, it shows that impulse purchasing may represent a barrier to developing intentions to use OFDS. Moreover, this result may suggest that there may be a missing link related to fulfilment between the stimuli that trigger purchasing in impulsive consumers and their food product purchasing and that the experiential and multidimensional representation of food products on OFDS at present perhaps is too complex for impulsive consumers to react. Yet, this finding positions this study uniquely within the literature in restaurant management, as the literature illustrates that the traditional experience can include impulse purchasing.

Adding congruity with self-image to the model allowed for a thorough understanding of the motivational processes that occur when consumers face the purchase of experiential and multidimensional food products in an online retail environment with which they resonate. Thus, this study extends the work conducted in mainstream restaurant management research, where congruity is viewed as a cognitive factor that influences consumers' restaurant experiences. As an important element of firms' marketing strategies, designing strategies based on congruity with self-image of the consumers in the target market, this study shows that such strategies can be continuously implemented in e-commerce. Thus, this study advances the hospitality marketing literature into the area of online food distribution, which is likely to become a complex but critical element of restaurant management.

Another important implication is the use of mindfulness as a second order construct, which directly addressed the third research lacuna. The study used three dimensions of mindfulness, emphasizing how to adapt this multidimensional construct to the restaurant industry, bringing substantial contributions to the literature in consumer psychology and restaurant management. The contribution to consumer psychology is the extension of the scope of mindfulness to include foodservice-related technology systems such as OFDS. While mindfulness has been utilized in the literature in IS contexts, this study shows how to extend that scope into consumers e-commerce environments characterized by fragmentation, combined routine-experiential tasks and emerging markets with novel business models. The contribution to restaurant management literature is that, for the first time, mindfulness is recognized as an important aspect of navigating through a food product ordering experience without the typical aspects that facilitate the ordering in the traditional restaurant setting. Thus, this study demonstrates that examining the restaurant purchasing

environment could be extended to online environments, which can further guide research on how restaurant products should be commercialized online.

A final implication comes from the conceptualization of habit and mindfulness within the same model. This provides a much-needed complementary view of artifacts influencing intentions that reflect the way consumers' thoughtful processes (captured by mindfulness) work together with consumers' automatic processes (captured by habit) to facilitate a target behavior. As a result, the study occupies a unique position in the marketing literature.

Practical implications

As OFDS are developed to address the strategies of two main categories of gatekeepers (i.e. OFDS developers merchandising the restaurant product inventory, and restaurants providing it), this study's practical implications are twofold.

The study confirmed that the performance expectancy of OFDS predicts consumers' intentions to use OFDS. Thus, OFDS developers should emphasize the key attributes of the ordering task and design OFDS that capitalize on those attributes. For example, the ordering interfaces should be designed with concise information and without unnecessary dialogs that ask consumers to make decisions at each step/screen of the purchasing. Moreover, OFDS could allow for opportunities to customize the interactions such as skipping intermediary steps (e.g. quick checkout option in addition to options for customization). This way, consumers' experiences can become frictionless and their task performance improved. Moreover, developers can offer multiple methods of continuing consumers' tasks, such as reminders for abandoned carts or offering planning tools for future purchasing tasks. Restaurants can provide OFDS with only the relevant information (such as picture, ingredients and price), so that the amount of information presented on OFDS does not constitute a bottleneck, thereby maintaining consumers' focus on the task. Overall, both OFDS developers and restaurants could emphasize the idea that ordering online can be more efficient compared to ordering using other methods by offering a variety of food products and efficient ordering interfaces.

The results confirmed that consumers' intentions to use OFDS are tied with their perceived self-image. OFDS developers should capitalize on this relationship by considering consumers' characteristics and lifestyles (e.g. less time to cook because of work, tendencies to eat in restaurants or trying new things). Such characteristics can easily be learned by OFDS because of the multiple analytic tools available and the rich data that consumers voluntarily disclose. Specifically, developers could promote unique offers that are designed for specific segments of consumers such as grab-and-go or Friday night order out. They could place advertising material in social media with links to OFDS or schedule advertising prior to rush hour online in office buildings or public transportation. In contrast, restaurants must ensure that the products they sell are aligned with the dominant lifestyles from the targeted segments. Restaurants can learn about such lifestyles from point of sale data, social media entries and the analytics provided by their own storefront websites. Ultimately, restaurants could use such information to develop marketing strategies for OFDS that monetize their knowledge of consumers' preferences and lifestyles.

This study revealed that there is a negative relationship between impulse buying tendency and intentions to use OFDS. To facilitate intentions to use, OFDS developers should design interfaces that do not necessarily stimulate impulse purchasing, even though this might be tempting for restaurants. In restaurants, impulse purchasing is stimulated on the premises by the interactions with the servers who present new options and off-the-menu products when consumers are already seated. To overcome this aspect, restaurants should treat all the products in a similar manner in terms of likelihood of being purchased as

opposed to at the end of it. Specifically, restaurants could develop strategies that present all relevant information in as few screens as possible to consumers, therefore facilitating their overall evaluation grounded in comprehensive cognitive processes that diminish impulse purchasing.

Limitations and future research

While this study opens new avenues for research in restaurant IS, it has several limitations. Thus, its results should be interpreted within the study's context. First, the data were collected only in the USA; therefore, the study only reflected consumers' behavioral intentions of using OFDS in the USA. By focusing on the US market, the study considered only the behaviors of consumers *vis-à-vis* restaurants in the USA, which reflect the general lifestyle of the population in the USA. (e.g. career emphasis, low discretionary time, abundance of restaurants) (Kotler *et al.*, 2016). Thus, the generalizability of the results may be limited beyond the USA. To address this issue, future research can be replicated in other countries.

This study developed a model that comprehensively explains OFDS adoption while keeping parsimony. Therefore, scholars can advance this topical area by using additional constructs that describe consumer or system attributes or the relationship with the restaurant (e.g. loyalty, trust). While this study used a general sample to maximize external validity, future research can model various demographic and behavioral variables as moderators. For example, future research can examine whether variables such as gender or age influence purchasing on OFDS. Moreover, future research could examine how the motivations of the entire consumption party (e.g. family, group of friends) are represented by the purchasing decisions of the person that actually makes the purchase using OFDS.

This study focused on the general intentions to use OFDS rather than on any specific OFDS because of the unfeasibility of operationalizing the actual consumers' intentions of using separate OFDS within the envelope of a single study. As the OFDS market is becoming increasingly competitive and consumers have enough information to determine the positioning of various OFDS, future research could focus on specific types of OFDS. In this context, the role of pricing incentives such as coupons or discounts could be an important direction for future research. This area could be even more fruitful as artificial intelligence algorithms are increasingly used within the pricing strategies of online retailers. Overall, the study brought initial insight into understanding how restaurant consumers use OFDS. As this area of food service and technology consolidates, further research is necessary to understand the mechanisms by which consumers, OFDS and restaurant stakeholders appropriate value.

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