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Crisis to Success: Online Food Delivery for Restaurants' Sales Performance and Customer Purchase Intention

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Abstract

Identifying factors influencing food delivery sales and customers' intentions amid pandemic restrictions aids strategic planning for restaurant business in uncertain business environments. This paper aims to explore restaurant survival strategies by examining customers' purchase intentions towards online food delivery services. The results of this paper assist restaurant business in establish a sustainable competitive advantage amidst market crises with a focus on organizational learning for future events. This paper utilized a mixed-method approach and comprised two studies. Study one explores factors affecting online food delivery sales through multiple linear regression analysis. Study two investigates customers' intentions under online payment concerns through structural equation modeling. Insights from these studies empower restaurants to thrive amidst uncertainty, offering essential guidance for their resilience and success. The results of Study 1 established a positive relationship between the crisis and restaurant delivery sales, providing empirical support for the structural model proposed in Study 2. Study 2's findings demonstrated that the three subdimensions of salient belief can be explained by a common underlying higher-order salient belief factor model. The invariance analysis revealed statistical equivalence between the two levels of online payment concerns.

Keywords: online food delivery service, online payment concerns, salient belief, market crisis, multimethodologies

Introduction

The restaurant industry faced significant struggles due to the impact of COVID-19. Data shows a substantial decline in business: At the end of 2020, the restaurant industry saw total sales that were \$240 billion less than the National Restaurant Association's pre-pandemic sales projection for that year. Many establishments have experienced devastating losses, with over 110,000 restaurants permanently closing their doors (National Restaurant Association, 2021). Although the outcome is devastating, these challenges present a crucial opportunity for learning and adaptation. Restaurant businesses must analyze the factors that contributed to their difficulties and investigate the survival strategies they have adopted to adapt to the new normal following the COVID-19 outbreaks (Zapata-Cuervo et al., 2021). By leveraging the lessons learned and incorporating robust online delivery options, restaurants can build resilience and ensure continuity in times of crisis.

It is evident that during COVID-19, online delivery services gained immense popularity. During the first wave of COVID-19 in March 2020, spending on food delivery increased by 70% compared to March 2019 (Chen McCain et al., 2021). Notably, even before the pandemic, online food delivery services had been gaining popularity (Muller, 2018). Customers' intention to use online food delivery was proven to be impacted by many factors, such as system trust, convenience, design, and food choice (Cho et al., 2019), performance expectancy and congruity with a self-image (Gunden et al., 2020). And in the context of COVID-19, researchers have explored the theory of planned behavior (TPB) model to explore the predictors for consumer intention to use online food delivery service (Hamid & Azhar, 2023; Poon & Tung, 2024). However, these explorations have strictly followed the original TPB model to test the attitude, subjective norm, and perceived behavior control separately. However, human behavior, especially intention, is something that should be considered a combined behavior of the multiple contributors (Kim et al., 2003). As previous researchers do for the overall prediction of human behavior (Hagger & Chatzisarantis, 2005; Rhodes & Blanchard, 2006), the combined effects of the three factors in the TPB model and their impact on the intention should be explored. Besides, concerns about online payments and security issues have been found to influence customers' intention to use online delivery services (Bashir et al., 2015). It is essential to understand how these concerns impact customer behavior in the context of online food deliveries. However, there has been a lack of comprehensive empirical tests regarding multiple risk factors in the process of online food delivery service consumption. Especially, universal view on such risk factors should be validated for future application with the model tested in this study. However, validation of the model, each path in it, and all factors that may cause any variant influence in the model are more than essential for the future study, which indicate needs of invariance testing for the validation of the path regarding risk factors.

Therefore, the primary goal of this paper is to address this research gap. First, factors that affect food delivery sales should be identified for restaurants' strategic planning. Furthermore, restaurant firms need to understand customers' intentions to use such services amid critical risks to maximize sales revenue. Hence, it is paramount to provide risk strategies for restaurant firms to create sustainable competitive advantage amid crisis in the market with organizational learning purposes for future events. To fulfil the purpose of this study, we present the following specific objectives:

- Analyze the contribution of online food delivery services to restaurant sales performance during crisis situation in the market (COVID-19 in this study as an example crisis),
- Empirically test the structure of key variables of the TPB model and improvise salient beliefs to the model to improve the explanatory power of consumer behavioral intention,
- Investigate consumer purchase intention toward online delivery service in a crisis situation and salient beliefs, and
- Explore the variance between high and low levels of online payment concerns and their potential contribution to the proposed structure.

To achieve these objectives, two studies were designed: Study 1 was a preliminary study on the impact of online food delivery services on restaurants' sales performance under a crisis in a market, and Study 2 explored customers' intentions to use online food delivery services during a crisis under online payment concerns. This research was conducted under the enormous impact of COVID-19 as a good example of a massive volatile market crisis on the restaurant industry. This study attempts to contribute to the body of literature on customer risk reduction strategies,

customer purchase intention, and the effectiveness of contactless online food delivery based on market condition. The results of this paper could help restaurant businesses navigate through future similar crises, as well as provide a prediction of the future of online food delivery in the *new normal* times and further.

Literature Review

Industrial Background

The COVID-19 pandemic caused a severe crisis for hospitality businesses. Many restaurants had to close, while others reopened with limited seating to adhere to social distancing regulations. The majority of the restaurants shifted their focus to providing delivery services to increase business competitive advantage amid the crisis (Kim & Lee, 2020).

In 2007, the fast-food company Pizza Hut was the first to focus on delivery service to create a competitive advantage that eventually drove the company's growth (Daryanto *et al.*, 2020). Food delivery has since become a familiar term. While digital technology development continues to change the dynamics in the food industry, food providers are increasingly challenged to offer innovative ordering and delivery methods (Rodriguez & Piccoli, 2020). Especially because of the nationwide lockdown amid the pandemic, customers are encouraged to buy products online to reduce the spread of disease. Food delivery service is also preferred by customers for its convenience, safety (fear of infection), and cost-effectiveness (Mehroliya *et al.*, 2020). With the rising need for food delivery services, restaurants need to understand the importance of delivery sales amid turbulent market situations. Therefore, Study 1 focuses on clarifying the following research question:

- How do COVID-19 and derivative business restrictions signify sales from food delivery services and the sales performance of restaurant firms?

Zhang *et al.* (2019) found that attributes, such as number of reviews of the restaurant, delivery fees, and WOM, all influence restaurant delivery sales. Amid COVID-19, whether these factors changed the impact on restaurants' delivery sales can be studied to support better strategic planning. Therefore, the second research question for Study 1 is as follows:

- What factors contributed to the change in food delivery sales amid COVID-19?

Theoretical Background

Theory of Planned Behavior (TPB)

Ajzen and Fishbein (1980) assumed that human behavior can be predicted by intentions and that humans are rational in making use of information systematically. Later, Ajzen (1985, 1991) developed the TPB model by adding the nonvolitional control-perceived behavior control factor. With this development, intention can be better examined through personal surroundings (attitude), social surroundings (subjective norm), and nonvolitional determinants (perceived behavior control).

According to Ajzen and Fishbein (1980), salient behavioral, normative, and control beliefs are the underlying determinators of attitude, subjective norm, and perceived behavioral control, respectively. In this paper, the TPB model will be employed to predict the effect of underlying

beliefs on customers' purchase intention toward online food delivery services. Based on this model, a more detailed explanation of the three main components (attitude, subjective norm, and perceived behavior control) and their determining beliefs (behavioral, normative, and control belief) will be discussed in detail.

Behavioral belief is the determining belief for an attitude. Ajzen (1991, p. 12) defined attitude as “the degree to which a person has a favorable or unfavorable evaluation of the behavior in question” and considered attitude to be the main important predictor of behavioral intention. Jeong and Lambert (2001) confirmed that attitudes toward a lodging company's website positively affect customers' online accommodation purchase decisions. Paul et al. (2016) proved that attitude is a strong predictor of intention to purchase green products. In the context of online food delivery services, previous literature suggests the expectation that attitude toward online food delivery services would affect purchase intention for online food delivery services (Yeo et al., 2017).

Normative belief is the determining belief for *the* subjective norm. It captures individuals' feelings about the social pressure they feel about a given behavior (Paul et al., 2015). This social pressure usually comes from others who are important or close to the person, such as friends, family, colleagues, or business partners. Park (2000) highlighted the influence of such relationships on an individual. Subjective norm is represented by normative belief; it refers to a particular behavior that is expected to be performed in certain situations. (Ajzen & Fishbein, 1972). Numerous researchers have employed subjective norms as a key factor in determining intention within the context of consumer behavior (Chen et al., 2020; Kim et al., 2013; Poon & Tung, 2024).

Control belief is the determining belief in perceived behavioral control. Ajzen (1991, p. 188) defined perceived behavioral control as “the perceived ease of difficulty of performing the behavior.” Many researchers have demonstrated a positive link between perceived behavioral control and behavioral intention. Chen and Tung (2014) proved that PBC plays a critical role in purchase intention in the context of green hotels. Kim and Hwang (2020) confirmed that perceived behavioral control is positively associated with drone food delivery service purchase intention. Likewise, the study argues that when customers have higher perceived behavioral control over an online food delivery service, the likelier it is for them to use this service.

Salient Belief as a Second-Order Factor

Previous researchers have set many precedents to modify the TPB model to provide more sound theoretical support. Pavlou and Fygenon (2006) applied the second-order factor method for a better measurement of perceived behavioral control for electronic commerce adoption. Salient beliefs include behavioral beliefs, normative beliefs, and control beliefs, which, respectively influence people's attitudes, subjective norms, and perceived behavior control. It is arguable and debatable whether salient beliefs can improve the explanatory power of behavioral intention as a second-order factor. Therefore, the structure of three variables or their determining beliefs, including attitude (behavioral belief), subjective norm (normative belief), and perceived behavioral control (control belief), should be empirically tested in this study. Based on the preceding theoretical foundation, the following hypothesis is proposed:

- H1: The three distinct but related subdimensions of salient belief (behavioral belief, normative belief, and control belief) can be accounted for by a common underlying higher-order salient belief factor model.

Perceived Risk of COVID-19

Amid the pandemic, risk reduction strategies, such as ordering take-outs and using food delivery services, were utilized by customers as a risk reduction strategy to minimize their perceived risks (Mitchell & McGoldrick, 1996). Yıldırım and Güler (2020) believed that risk perception is an important determinant of people's willingness to engage in certain behavior. In the context of this paper, the perceived risk refers to a customer's evaluation of fear of COVID-19 infection when purchasing from a restaurant.

Purchase intention refers to a customer's willingness or readiness to engage in behavior with consideration (Han & Kim, 2010). Regarding online purchasing, customers' purchase intentions can be affected by many factors, including perceived trust, past online experience, web features, privacy, and perceived risk (Meskaran et al., 2013). When customers make purchases online, perceived trust is a key factor that they consider (Swidi et al., 2012). Yuliharsi et al. (2011) found that normative beliefs and self-efficacy influence students' buying intention on the internet. Intention to use online food delivery services indicates the extent to which customers are willing to purchase such services. Based on the preceding theoretical foundation, the following hypothesis was proposed:

- H2: Customers' perceived risk toward COVID-19 positively affects their intention to use online food delivery services.

Previous researchers have proved the influence of perceived risk on attitude, subjective norms, and perceived behavior. In terms of the relationship between perceived risk and attitude, Kim and Lee (2020) proved that COVID-19 has a positive impact on customers' attitudes toward private dining facilities in restaurants. Pillai et al. (2022) proved that customers' perceived risk influences their attitude toward street food and behavioral intention. Based on the preceding theoretical foundation, the following hypothesis was proposed:

- H3: Customers' perceived risk toward COVID-19 positively affects their salient beliefs toward online food delivery services.

As for the relationship between perceived risk and subjective norms, Zhao and Bacao (2020) confirmed the positive effect of social influence on customers' continuing willingness to use food delivery apps during COVID-19. In the context of perceived risk and perceived behavioral control, Hansen et al. (2018) proved that increased perceived risk toward transactions through social media is associated with lower perceived behavioral control. Based on the preceding theoretical foundation, the following hypothesis was proposed:

- H4: Customer's salient beliefs toward online food delivery services positively affect their intention to use online food delivery services.

Security Concerns With Online Payments

According to Culnan (1995), privacy is defined as an individual's capacity to manage the access others have to their personal information. Brown and Muchira (2004) further identified three specific privacy concerns that have been identified as important to customers: unauthorized secondary use of data, privacy invasion, and errors. Among these concerns, errors and invasion of privacy have been proven to show a significant negative relationship with online purchase behavior (Brown & Muchira, 2004).

Kalakota and Winston (1997) describe security as a threat that leads to issues concerning the protection of payments and the storage of information during online transactions. Kwon and Lee (2003) figured out that the greater a customer's concern about payment security, the fewer online purchases they tend to make. Trust has been a popular topic amid the increasing rise of online purchase technology. Researchers have delved into the impact of trust on customer online purchase intention, especially during the COVID-19 pandemic. (Alvarez-Risco et al., 2022; Faqih, 2022; Leong & Chaichi, 2021). Customers' privacy and security concerns can be hypothesized as having a moderating role in the relationships between attitude and purchase intention, subjective norm, and purchase intention, perceived behavioral control and purchase intention, and perceived risk of COVID-19 and purchase intention.

- H5: There is a variant path in the structural model based on the level of online payment concern.

Methods

Research Design Study 1

Study 1 aims to comprehensively explore the potential influence of volatile business environment and derivative business restrictions on restaurant delivery sales, as well as the potential factors that are contributing to the change of online food delivery sales under such uncertain market condition.

Data

Data on the average monthly delivery sales for individual operations in 2019, as well as the first and second quarters of 2020, were obtained from Meituan, China's largest food delivery service provider. To evaluate the influence of a volatile market environment, this study collected data from Hangzhou, where full business restrictions associated with COVID-19 were enforced amid COVID-19. A total of 5,715 restaurants in Hangzhou, China, was included in the analysis. The mean and sum of 2020 monthly delivery sales among these restaurants were ¥886.863 and ¥5,083,498, respectively. As for 2019, the mean and sum of monthly delivery sales of 2019 were ¥672.259 and ¥3,853,389. These numbers proved the increase of food delivery sales in Hangzhou from 2019 to 2020 due to COVID-19. Descriptions of variables are listed in Table 1 below.

Table 1. Variable Abbreviation and Description

Abbreviation	Description
SALES2020	Average monthly delivery sales of individual restaurants in first and second quarters of 2020
SALES2019	Average monthly delivery sales of individual restaurants in 2019
RATE	Restaurant's average rating in 2020
REVIEW	Restaurant's average rating in 2019
PRICE	Restaurant's average price for food items in 2020
TIME	Average delivery time in 2020
MINIMUM	Minimum RMB amount per order eligible for delivery in 2020
FEE	Average delivery fee charged per order in 2020
BRAND	Whether the restaurant is a well-known brand

Model

Various restaurant attributes were analyzed in relation to monthly sales. The formulated model was estimated with fixed-effects analysis:

$$\ln SALES2020 = \beta_0 + \beta_1 SALES2019 + \beta_2 RATE + \beta_3 REVIEW + \beta_4 PRICE + \beta_5 TIME + \beta_6 MINIMUM + \beta_7 FEE + \beta_8 BRAND + \varepsilon \quad (1)$$

To investigate how COVID-19 and derivative business restrictions signify sales from food delivery services, multiple linear regression analysis was used to develop a model for predicting restaurant's monthly delivery sales in 2020 (DV) from restaurant's monthly delivery sales in 2019 (SALES2019, IV1), average rating of restaurant in 2020 (RATE, IV2), review volume in 2020 (REVIEW, IV3), average price in 2020 (PRICE, IV4), delivery time in 2020 (TIME, IV5), minimum RMB amount of order for delivery (MINIMUM, IV6), average delivery fee per restaurant operation (FEE, IV7), and brand or not (BRAND, IV8, 0 for *weak brands*, 1 for *strong brands*).

Result

The eight-predictor model was able to account for 27.86% of the variance in restaurants monthly delivery sales in 2020, $F(9,5706) = 275.384$, $p < .05$, $R^2 = .27855$, 95%. Among the eight predictor variables evaluated, seven of them were found to be statistically significant ($p < .05$; see Table 2).

Table 2. Regression Analysis Result

Variable	Coefficient	S.E.	t	p
SALES2019	0.242	0.015	16.673	.000**
RATE	85.002	11.082	7.670	.000**
REVIEW	0.112	0.006	20.233	.000**
PRICE	2.584	1.057	2.445	.014*
TIME	-1.059	1.079	-0.982	.326
MINIMUM	-1.388	0.496	-2.798	.005**
FEE	14.386	3.394	4.238	.000**
BRAND	42.407	19.325	2.194	.028*

Note. $N = 5,715$. * $p < .05$; ** $p < .01$. $R^2 = .279$; $F(9, 5706) = 275.384$. The dependent variable for all regressions was SALES2020

Conclusion

Among all variables assessed, the average rating was proven to be the most impactable factor for delivery sales: When the average rating of a restaurant in 2020 increases by one unit, the 2020 monthly delivery sales increase by ¥85.00. A restaurant's review volume and rating also appeared to positively impact 2020 monthly delivery sales.

The results also showed that price-related factors had a significantly positive impact on delivery sales: 1 unit increase in restaurants' average price in 2020, and delivery fee resulted in an increase of ¥2.58 and ¥14.39 in monthly delivery sales, respectively. This finding was indirectly consistent with that of Duad and Yoon (2019), who found that price is not a factor in online delivery decision making, and it made more sense if the impact of COVID-19 was taken into consideration. Amid crises such as COVID-19-19, online food delivery service became the most utilized food ordering method. Customers were less sensitive to prices and preferred food to be delivered (Nguyen & Vu, 2020).

The significant relationship found between restaurants' monthly delivery sales in 2020 and those in 2019 also proved that market crisis triggered by COVID-19 has prompted an increase in delivery sales in restaurants from 2019 to 2020. Many customers were compelled to stay at home and opted to use online food delivery services for their meals (Mehroli et al., 2020). The perceived benefit

associated with online food delivery services included contactless delivery and e-wallet payment, which reduced the risk of COVID-19 transmission (Nguyen & Vu, 2020). Hobbs (2020) reported that the perceived benefits of online delivery positively influenced purchase intentions during COVID-19.. This finding confirmed the necessity of online food delivery service-related research and provided a supporting background for Study 2 of this paper.

Research Design Study 2

Study 2 was designed to explore the customer's purchase intention for online food delivery service during a market crisis, exemplified by COVID-19, under the moderating effect of online payment concerns. In this study, customer's perceived risk towards COVID-19 and customers' salient belief towards online food delivery service are the two main independent variables. Customers' purchase intention towards online food delivery services was the dependent variable. Online payment concern was tested as a moderator that affects the strength of the relationships.

Data Collection

Data was collected between December 2020 and February 2021. The research questionnaire was developed by adapting TPB constructs to fit our research context. The questionnaire was generated through Qualtrics. A total of 320 responses were received, 294 of which were completed. The sample was divided into two groups: one group includes participants who were highly concerned about online payments safety, the other group consists of those who were less concerned about online payments.

Measurements

Multiple measurement scales were adapted with minor revisions to measure a total of 6 constructs described in 27 items in Table 3. According to Table 3, three items for attitude and three items for subjective norm were adapted from Lee (2009), six items for perceived behavior control from Lee (2009) and Shin and Hancer (2016), four items for purchase intention towards online delivery service from Venkatesh et al. (2003) and Cho et al. (2019), eight items for perceived risk of COVID-19 from Yildirim and Guler (2020) with minor revisions to reflect the COVID-19 circumstances, and three items for online payment concerns from Haddad and Hage (2018). All constructs were measured by a seven-point Likert-type scale (1= strongly disagree, and 7 = strongly agree).

Data Analysis

Two-step approach was adopted to test the hypotheses. First, a confirmatory factor analysis (CFA) was conducted to reduce measurement error resulting from construct with various indicators. Second, structural equation modeling was conducted to help identify holistic relationships among latent factors. Structural model fit indices were employed to test the proposed hypothesis in conceptual model, including chi-square, RMSEA, CFI, and NNFI. Invariance analysis between high and low levels of online payment concern was conducted to:

- Validate the holistic structural model that provides cross-sectional snapshot of what has been observed in the market, and

- Prove whether statistically significant differences exist between groups. In the structural model, the coefficient of each relationship was measured.

Table 3. Measurement Item List

Measurement Item	Source
Attitude Toward Online Food Delivery Service	Lee, (2009)
Item 1: I think using online food delivery service is useful.	
Item 2: I am strongly in favor of using online food delivery service.	
Item 3: I desire to use online delivery service when I purchase food.	
Subjective Norm	Lee, (2009)
Item 1: People who are important to me think I should use online food delivery service.	
Item 2: People who influence me would think I should use online food delivery service.	
Item 3: People whose opinions are valued to me would prefer that I should use online food delivery service.	
Perceived Behavioral Control	Lee, (2009)
Item 1: I think that I would be well capable of using OFDS to buy food well.	Shin & Hancer (2016)
Item 2: I think that using online food delivery service would entirely within my control.	
Item 3: I think that I have the resources, knowledge, and ability to use OFDS.	
Item 4: I am confident that I could use online food delivery service if I want to.	
Item 5: I think it is easy to use online food delivery service.	
Item 6: whether I purchase food through online food delivery service is entirely up to me.	
Purchase Intention for Online Food Delivery Service	Venkatesh et al. (2003)
Item 1: I intend to use online food delivery systems in the future.	Cho et al. (2019)
Item 2: I will always try to purchase food through online food delivery service.	
Item 3: I will recommend to others to use online food delivery service.	
Item 4: Online food deliver service would be among my favorite technologies.	
COVID-19 Perceived Risk	Yildirim & Guler (2020)
Item 1: I think the perceived possibility of me acquiring COVID-19 is high.	
Item 2: I think the perceived possibility of me acquiring COVID-19 compared to other persons is higher.	
Item 3: I think the perceived possibility of dying from COVID-19 is high.	
Item 4: I fear for myself contracting COVID-19.	
Item 5: I fear for a family member contracting COVID-19.	
Item 6: I fear for COVID-19 emerging a health issue.	
Item 7: I fear for COVID-19 occurring in the region.	
Item 8: I think the perceived possibility of other disease (e.g. diabetes/asthma) is high.	
Concerns Towards Online Payment	Haddad & Hage (2018)
Item 1: I feel concerned about my privacy when paying online.	
Item 2: I feel concerned about my financial loss when paying online.	
Item 3: I believe that my personal and financial information I provided when I pay is sensitive.	

Results

A total sample of 294 respondents were included in the analysis. As shown in Table 4, respondents counted relatively equal between male (49.5%) and female (50.3%). Most of the participants (48.6%) were between 18-25 years old.

Measurement and Model Comparison

Confirmatory Factor Analysis (CFA)

The CFA was adopted to estimate the measurement model. Discriminant validity was confirmed since Cronbach's α ranged from .810 to .939 previously, there have been multiple arguments over how the perceived risk of COVID-19 should be measured. Kira et al. (2021) effectively utilized the second order factor model to measure COVID-19 stressors. Siswanto and Djuraidah (2017) compared first and second order factor models to find the more reasonable matrix for the disease studying of Malaria. Based on such precedence and the initial factor analysis result, items for COVID-19 were separated to measure two different constructs: COVID-19 perceived risk (items 1-3) and COVID-19 fear (items 4-7). Model comparison was conducted between the first order factor model and second order factor model. Alternative models were compared with a null model.

A series of competing factor models was evaluated to assess the quality of the final model. The estimated models included;

- A null model with five first-order constructs (Ajzen, 1985, 1991),
- Two second order factors model,
- One second-order factor (customers' perceived risk toward COVID-19) model with common latent factor (*CLF*), and
- Two second order factor model (customers' perceived risk toward COVID-19 and their salient beliefs toward online food delivery services) with *CLF*.

Table 4. Demographic Information

Characteristic	<i>f</i>	%
Gender		
Male	144	49.3
Female	147	50.3
Prefer not to say	1	.3
Age		
18-25	143	48.6
26-35	88	29.9
36-45	41	13.9
46-65	19	6.5
66 and above	3	1.0
Race		
White	127	43.2
Black or African American	10	3.4
Indian or Native American	5	1.7
Asian	130	44.2
Other	22	7.5
Education		
High school graduate	34	11.6
Some college but no degree	53	18.0
Associate degree in college	39	13.3
Bachelor's degree	121	41.2
Master's degree	40	13.6
Doctorate degree	7	2.4
Income		
Less than \$20,000	72	24.7
\$20,000-\$39,999	72	24.7
\$40,000-\$59,999	49	16.8
\$60,000-\$79,999	35	12.0
\$80,000-\$99,999	23	7.9
\$100,000-\$119,999	23	7.9
\$120,000 or future	18	6.2
Number of people in household		
1	45	15.3
2	59	20.1
3	68	23.1
4	70	23.8
5	31	10.5
6	12	4.1
More than 6	9	3.1
Employment		
Employed full time	130	44.2
Employed part time	71	24.1
Unemployed looking for work	11	3.7
Unemployed not looking for work	4	1.4
Retired	3	1.0
Student	74	25.2
Disabled	1	.3

Note. *N* = 294.

It was clear that chi-square values are statistically different between models with (Model 3 and Model 4) and without *CLF* (Model 1 and Model 2). Other model fit indexes were benchmarked for model comparison to overcome small sample size sensitivity. Table 5 below shows the statistics

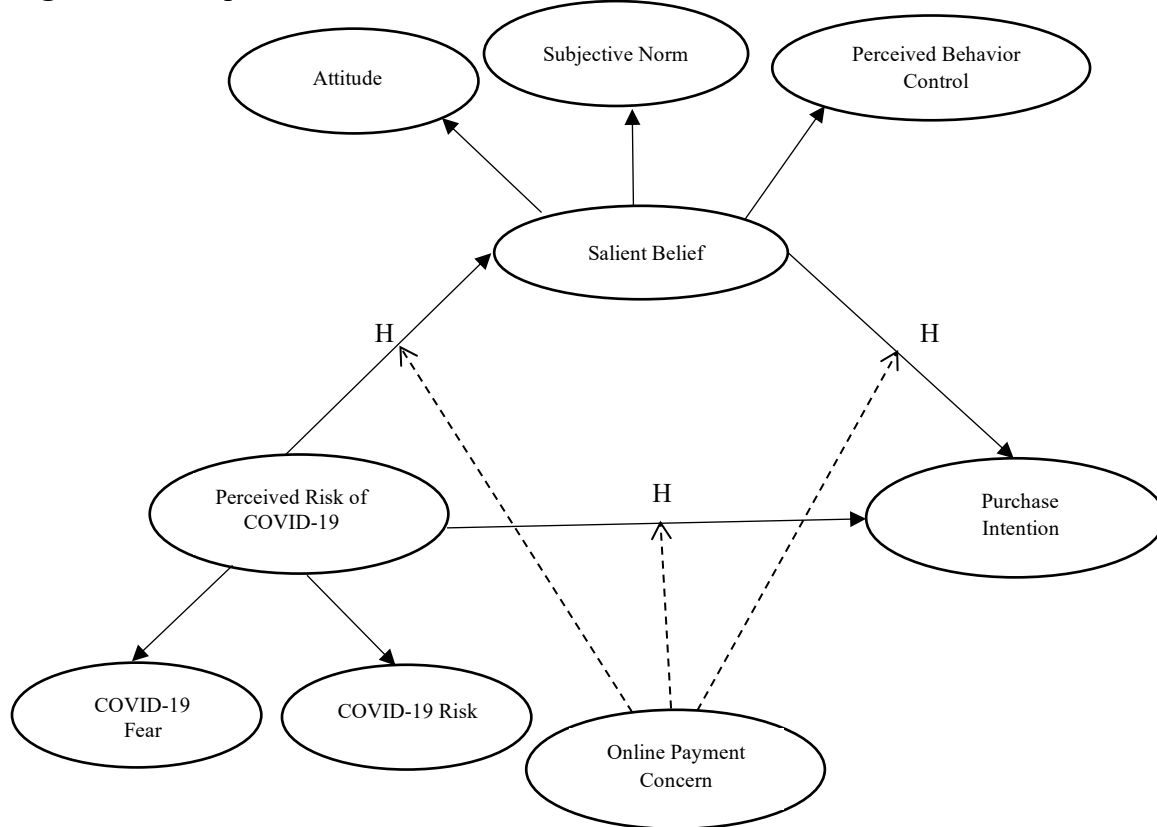
of competing models for the customer's intention to use online food delivery services. Model 4 presents a better model fit than M3, so it was chosen to be the final structural model. Based on the model comparison, hypothesis 1 is supported. Figure 1 presents the final conceptual model with two second order factors.

Table 5. CFA Results for Competing Models

Model	Model	χ^2	<i>df</i>	$\Delta\chi^2$	Δdf	<i>NNFI</i>	<i>CFI</i>	<i>RMSEA</i>
M1	Null Model	1094.918	436			.895	.907	.720
M2	Two Second Order Factor Model	1316.237	449	221.319	13	.865	.878	.810
M3	One Second order factor model with CLF	496.992	259	819.245	190	.948	.958	.056
M4	Two second order factor model with CLF	495.270	262	1.722	(3)	.949	.959	.055

Note. CLF = Common latent factor; $\Delta\chi^2$ = Chi-square difference statistic; Δdf = Difference in degrees of freedom.

Figure 1. Conceptual Model With Two Second-Order Factors



The CFA result of the final model showed a desired fit to data [$\chi^2(262) = 495.270, p < .05, \chi^2/df = 1.752, CFI = .959, NNFI = .949, \text{ and } RMSEA = .055$]. All items loaded above .40 and composite reliability of constructs ranged from .883 to .960. *AVE* values ranged from .358 to .890. Even though PBC failed to meet the recommended value of .50 (Fornell & Larcker, 1981), the second order factor models improve the convergent validity (see Table 6).

Structural Equation Model

The proposed structural model presented an acceptable fit to data in Table 7 [$\chi^2(597) = 1165.258, p < .05, \chi^2/df = 1.95, CFI = .947, TLI = .932, \text{ and } RMSEA = .040$]. Statistically significant path coefficients from customers' perceived risk toward COVID-19 to their intention to use online food

delivery services (H2, $\beta = .126$, $p < .05$, supported), customers' perceived risk toward COVID-19 to t salient beliefs toward online food delivery services (H3, $\beta = .263$, $p < .05$, supported), customer's salient beliefs toward online food delivery services to their intention to use online food delivery services (H4, $\beta = .951$, $p < .05$, supported) were found, indicating H2, H3, H4 were supported. To assess the difference between the two groups: high and low concerns towards online payment concerns, and their impact on customer's intention to use online delivery service, all samples were divided into two groups: high concern towards online payments, low concern towards online payments. Invariance analysis was conducted to find potential differences between groups.

Table 6. Reliability and Validity

Constructs	<i>M</i>	<i>SD</i>	<i>α</i>	Factor Loading	CR	AVE
Attitude			.848		.912	.776
ATT1	5.89	1.286		.856		
ATT2	5.60	1.446		.926		
ATT3	5.03	1.685		.859		
Subjective Norm			.939		.960	.890
SN1	4.53	1.534		.944		
SN2	4.56	1.531		.945		
SN3	4.48	1.532		.942		
Perceived Behavior Control			.926		.883	.358
PBC1	6.04	1.220		.862		
PBC2	5.83	1.356		.764		
PBC3	6.13	1.186		.909		
PBC4	6.16	1.222		.894		
PBC5	6.11	1.153		.847		
PBC6	6.23	1.119		.872		
Intention			.872		.874	.524
ITT1	5.65	1.396		.740		
ITT2	4.44	1.942		.858		
ITT3	4.99	1.523		.903		
ITT4	4.86	1.722		.905		
COVID-19 Risk			.837		.903	.755
CO1	4.08	1.741		.872		
CO2	3.82	1.780		.880		
CO3	3.78	1.869		.855		
COVID-19 Fear			.892		.895	.555
CO4	4.37	1.920		.843		
CO5	5.39	1.636		.830		
CO6	4.98	1.753		.906		
CO7	4.94	1.723		.903		
Online Payment Concern			.810		.887	.725
OPC1	4.72	1.655		.883		
OPC2	4.56	1.700		.873		
OPC3	5.27	1.469		.797		

Note. $\chi^2(262) = 495.270$; $p < .05$; $\chi^2/df = 1.752$; $CFI = .959$; $NNFI = .949$; $RMSEA = .055$

Table 7. Path Coefficient

Hypothesis	Path	Est.	CR	<i>p</i>
H2	CO → ITTN	0.126	2.219	.026
H3	CO → SB	0.263	3.165	.002
H4	SB → ITTN	0.951	12.346	.000

Note. CO = Customers' perceived risk toward COVID-19; ITTN = Purchase intention; SB = Salient belief.

Invariance Analysis

The quality of a specific path across groups was evaluated by sequentially constraining the parameters of interest to be equal in nested models. The baseline model was compared with a series of nested models, each imposing a specific parameter constraint between groups. The $\Delta\chi^2$, Δdf , and fit statistics (*TLI*, *CFI*, and *RMSEA*) of the models were then calculated for comparison

purposes. This test figured out whether the variations in the parameters of interest between groups were statistically significant.

The results of the comparison between models with series of path coefficient proved that none of the paths vary based on online payment concern (see Table 8). Differences of χ^2 and df are insignificant, which proved that online payment concern does not serve as a variant factorial role. There are no significant differences between high and low online payment concern concerns in all paths within the structural model, which means online payment concern is not a significant variable in the structure.

Table 8. Invariance Analysis Result

Group	Model	χ^2	df	<i>RMSEA</i>	<i>CFI</i>	<i>TLI</i>	$\Delta\chi^2$	Δdf	χ^2/df
OPC	Unconstrained	659.06	398	.051	.945	.929			1.746
	All Path	841.187	466	.053	.93	.924	146.127	68	1.805
	CO → SB	687.84	399	.05	.946	.932	-153.347	-67	1.724
	SA → ITTN	695.261	399	.05	.945	.93	7.421	0	1.743
	CO → ITTN	684.312	399	.049	.947	.932	-10.949	0	1.715

Note. OPC = Online payment concern; CO = Perceived risk toward COVID-19; SB = Salient belief; ITTN = Intention to purchase.

Conclusion

The first important finding was that the second-order modification of the TPB model was proven to be effective. The three components of the TPB (attitude, subjective norm, and perceived behavior control) proved to be better accounted for by a common underlying higher-order factor—salient belief. Second, the perceived risk was found to be a significant contributor to intention to use online delivery services. As previous researchers argued, customers tend to utilize risk reduction strategies to minimize perceived risk (Mitchell & McGoldrick, 1996). Before COVID-19, customers preferred to use online delivery services because of their convenience and efficiency (Sultan & Uddin, 2011). When the crisis occurred, more customers started to utilize this service not only for convenience but also to avoid disease transmission and infection. Furthermore, during COVID-19, the perceived risk of getting infected positively affected customers' salient belief in online food delivery services, which also significantly affected consumers' intention to use such services.

Previous researchers have found a significant impact of consumers' perceptions of mobile payment (Lian & Li, 2021; Rakhi & Mala, 2014). Contradicting their findings, the result of invariance analysis found an insignificant difference between high and low levels of online payment concerns on all paths in the structural model. Although this finding could not be supported by previous literature, the uniqueness of the time when this study was conducted should be considered—amid a crisis. A potential explanation could be that consumers are severely affected by the fear of contracting the disease, and this fear outweighed their concern about online payment. This explanation reaffirmed the consumer risk reduction strategy theory, in which consumers' purchase intentions reflect their adoption of strategies to minimize perceived risks.

Theoretical Contribution

This paper confirms the advantage of utilizing mixed methodologies for customer intention-related research. The correlation between online delivery service-related attributes and restaurant sales amid a turbulent market crisis was tested in Study 1, which successfully confirms the importance

of studying consumers' intention to use online delivery services, as it is proven to be critical to restaurants' performance under risky situations. It provided literature support for the positive relationship between restaurants' average ratings, review volumes, minimum delivery fees, prices, and delivery sales. It also confirmed a positive relationship between the COVID-19 crisis and restaurant delivery sales. Study 1 not only provided empirical support for the structural model proposed in Study 2, but it also justified the necessity of validating the structural model theoretically.

Study 2 further contributed to the extension of the TPB model with the impact of the COVID-19 crisis and customers' concerns about online payment. Under this extension, this study proved that the three subdimensions of salient belief (behavioral belief, normative belief, and control belief) can be accounted for by a common underlying higher-order salient belief factor model. Such comprehensive understanding of the underlying construct of the salient belief successfully provides additional explanation regarding the holistic relationship between intention and belief context. The expanded structural model provided precedent results that customers' perceived risk was a significant contributor toward their intention to use online food delivery services. This finding provided firm support for future studies on customer risk reduction strategies.

The results of the invariance analysis demonstrated statistical indifference between the two levels of online payment concerns. This study revealed that concerns about online payments have varying impacts on consumers' purchase intention under different contexts. Although insignificant differences were found between the groups, the fact that this study was conducted amid COVID-19 crisis could potentially illustrate that consumers adopt risk reduction strategies to reduce perceived risk. This finding showed that the factors that influence consumer behavioral intention in one direction could have a different impact under a different context.

Practical Implication

The results of this paper confirmed food delivery service as an effective sales diversification strategy for restaurant businesses to minimize the negative impacts of restricted business environments and to survive from the impact of volatile market environment triggered by COVID-19. The results of Study 1 tested major explanatory factors, such as average rating and review volume, that positively affect restaurants' food delivery sales under such environment. Restaurant owners and managers could learn the importance of such factors during operation processes. For example, during the process of food delivery service, service quality should also be ensured to provide a positive delivery experience for customers. Therefore, customers are encouraged to leave higher ratings or more reviews for restaurants, which prompts delivery sales or a restaurant's overall sales increase in general. To do so, restaurants could establish reward programs for customers. For each meal delivered, a thank you note that invites customers to *tell others about us* online can be attached. For example, once customers have successfully submitted reviews online, restaurants can send them a code for 15% off for the next delivery order. This method can encourage customers to participate in online reviews.

Furthermore, online delivery services are becoming more popular with customers, especially as they are being normalized by the COVID-19 outbreak. For restaurant business owners, it is important to establish effective operational strategies that comply with this trend. The competitive advantage of online food delivery services should be stressed. To obtain the capability of providing

delivery service, restaurant businesses can either partner with third-party delivery service providers or build their own team that specializes in providing delivery services. If they partner with third-party service providers, restaurants can list themselves in different delivery apps, such as UberEATS and GrubHub. This would increase exposure to customers and eventually attract more delivery businesses.

Study 2 provides restaurant firms and managers with a better understanding of customers' intention toward online food delivery services and the impacts of perceived risks toward COVID-19 crisis. Restaurant businesses should adjust their business plans according to reduction strategies adapted by customers. For example, when customers lean toward online food delivery services during COVID-19 crisis, businesses should allocate labor and resources to provide.

Although online payment security was not proven to influence customers' intention to use online food delivery services amid crises. Businesses could thrive to provide a safe online payment environment for their customers for sustained competitive advantage. Businesses should provide multiple payment channels for customers, including Quick Pay, Apple Pay, PayPal, electronic checks, and so on. If customers are worried about unauthorized secondary use of their personal information, they can choose to use Quick Pay. In this case, customers are no longer required to reenter personal information online. Second, businesses can also emphasize the high security and safety control of associated online payment platforms for customers. The two-factor authorization method can be adopted each time customers need to verify personal information. Lastly, restaurants can always give customers an option to choose whether they want to save their details for the next time to improve their experience. For customers who are sensitive to online payment safety, giving them an option is another way of reassuring the safety of their personal data. By ensuring the provision of these offerings, businesses can enhance customer retention not only during the crisis for survival but also for future operations.

Limitations and Future Study Suggestions

This study has several limitations. First, for Study 1, data was collected from only one city that was fully COVID-19 restricted. Therefore, this study was unable to include all possible factors that might affect online food delivery service behavioral intention. Future researchers could consider involving more cities or countries to test the regression model with more possible factors. Second, obtaining a larger sample size in Study 2 can result in stronger observation power. In addition, the data gathered for Study 1 and Study 2 came from two different countries. For Study 1, business performance data were collected from China, whereas the survey responses in Study 2 were collected from the USA. This paper could not neglect the gap in acceptance of online delivery services in these two countries. Future researchers could conduct in-depth gap analyses between different countries regarding the acceptance of online food delivery services. Lastly, the moderator role of online payment concern tested in this study should be extended. This study aimed to validate the holistic structural model that provides cross-sectional snapshot of what has been observed in the market. So, instead of testing multiple mediators and/or moderators in the model, this study was more focused on validation, justification, and verification of the paths. Since the invariance analysis validated the universal findings across group, future study can view online payment concern as a mediator or a moderator that provide diverse opportunities for comparing and contrasting magnitude of the path coefficient across groups.

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