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Sustainable Management of Online to Offline Delivery Apps for Consumers' Reuse Intention: Focused on the Meituan Apps

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Abstract: The COVID-19 pandemic has significantly changed our daily life, especially in the food industry. This study aims to examine the sustainable factors that influence the reuse intention in China's online-to-offline (O2O) food delivery industry, using "Meituan Waimai" app users as the objects of investigation. Meituan had great success in the initial stage of business due to the rapid urbanization of the major Chinese cities, and thus it is planning to enter the second and third level of cities in China. However, this may not be sustainable because beginner's luck does not hold unless it is supported by sustainable governance. To evaluate the online and offline governance of O2O business, we used five service quality factors (convenience, safety, economy, accuracy, and speed) in a structural equation model. Customer satisfaction and reuse intention are used as mediating and dependent variables, respectively. The main findings are as follows. First, among the service characteristics, economy and speed factors did not perfectly mediate satisfaction, implying that the initial stage of success may not be sustainable. O2O service providers in China should put more effort into customizing economic incentives as well as making an appropriate impression regarding the delivery speed. Second, satisfaction is fully supported by other factors, implying that O2O service providers should take into account feedback from the people in the market and consumers.

Keywords: O2O food delivery; reuse intention; structural equation modeling; Meituan; China



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1. Introduction

Following the spread and persistence of the COVID-19, the Online to Offline (O2O) based delivery services have become an increasingly important aspect of daily life in the global economy. Here, O2O is defined as the integrated business between online marketing and its offline commercial contract implementation activities based on a mobile platform. The competition among O2O delivery companies is becoming fiercer. Nonetheless, China achieved great success in this O2O delivery service as one of the model countries in the world, especially in the express food delivery business. In China, almost all foods can be delivered at much lower prices compared with dine-in restaurants, without any time and location limits. After several years of rapid development in the Chinese delivery market, the food delivery market has gradually matured. As shown in Figure 1, the annual growth rate of the delivery food market reached 20% in 2019. Therefore, the O2O style is rapidly replacing traditional restaurants as it offers the convenience of making transactions easily without any location and time limits.

However, as an O2O food delivery business draws closer to the maturity stage, market competition becomes fiercer, and more market-oriented strategies are needed to take off to the next stage of a sustainable business. Currently, as shown in Figure 2, "Meituan Waimai" has the highest market share in the O2O delivery market in China, with a 65% market share in the food delivery market. It is not easy for the Meituan to maintain its market share in the rapidly expanding market because it has already captured a large market share. Therefore, it urgently needs innovation to prevent the pitfalls faced by most companies.

Meituan and most other food delivery apps were simply favored by beginner's luck in the new market due to the COVID-19 pandemic. However, for sustainable success, the apps should consider the strategic factors for sustainable governance of O2O services. Therefore, appropriate evaluation of the O2O food delivery industry based on leading companies such as Meituan may provide important insights to many followers in developing countries as well as in other advanced economies during the COVID-19 pandemic era. This research aims to evaluate these governance factors for the sustainable performance of Meituan in China.

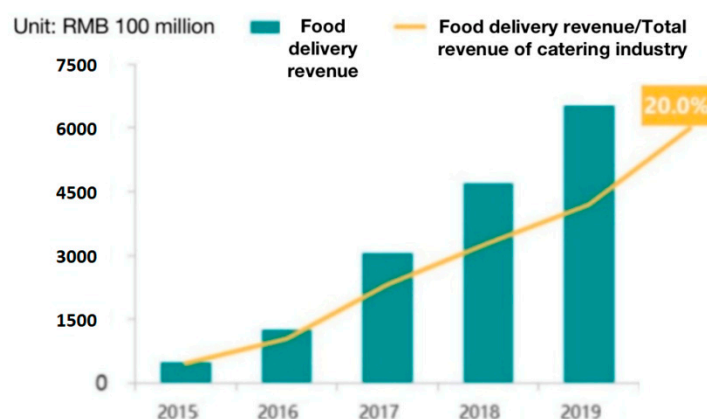


Figure 1. Revenue of the O2O food delivery industrial trend in China. Source: 199IT data center (<http://www.199it.com> (accessed on 23 March 2021)).

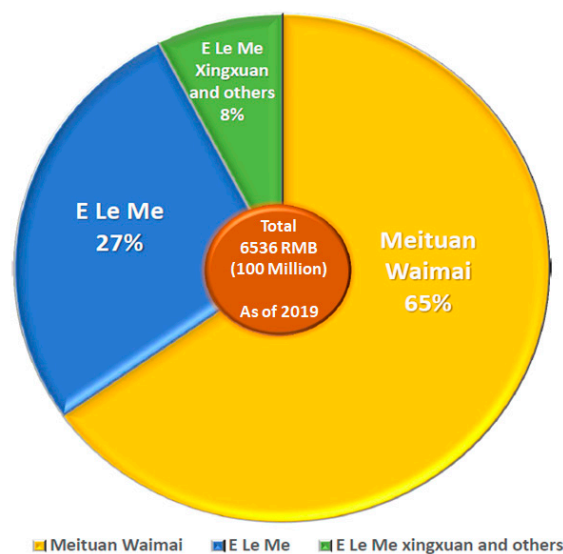


Figure 2. 2019 industrial share of Chinese food delivery apps. Source: 199IT data center (<http://www.199it.com> (accessed on 23 March 2021)).

The contributions of this study are as follows. First, we focus on Meituan Waimai, the ultimate leader in the O2O food delivery industry. The study will, therefore, contribute to understanding Chinese customers' needs and perceptions regarding the food delivery business. Second, as independent variables, we used service quality, which is widely used in this research area. Taking a step forward, we categorized it into two types: online and offline service quality. Delivering food involves a series of processes through which customers experience app usage and offline delivery services. Therefore, the empirical results of this study may provide directions regarding the factors that should be emphasized. In conclusion, we shall clarify the mediation role of "customer satisfaction" as a mediating variable. This result may provide guidance for business leaders in the O2O food delivery industry in drafting relevant marketing strategies.

The remainder of this paper is structured as follows. Section 2 reviews the related literature with respect to the O2O food delivery industry and develops hypotheses; Section 3 presents data and methodology; and Section 4 presents the empirical results of the study. Finally, Section 5 summarizes the study's conclusions and, based on the findings, offers insightful policy suggestions.

2. Theory and hypothesis

2.1. Theoretical Characteristics of the O2O Food Delivery Industry

As platform providers, Meituan and other food delivery companies connect diverse food service providers and consumers through online transactions and their offline implementation. Due to their open connectivity, service platform providers such as Meituan enable easy and convenient food deliveries without any time and location limits. To evaluate the performance of Meituan regarding sustainable management, our model will begin by considering the service quality characteristics in the literature. Satisfaction with service quality should be guaranteed in the long term with user satisfaction. Therefore, most of the studies that examine the O2O industry generally use the structural equation model (SEM) or partial least squares (PLS) approach because the reuse intention of customers could be examined using consumer satisfaction as a moderating variable [1–8]. Therefore, we also adopt SEM in this research and use variables based on service quality that were commonly and widely accepted in previous studies. In the next subsection, we explain how these variables influence the reuse intention with consumer satisfaction as the mediating variable.

2.2. Hypotheses on the O2O Food Delivery Industry Service Quality

Generally, the service quality of O2O food delivery can be measured using the comparative degree between perceived expectations and its realized performance. After using a service, customers may compare the service they expected versus the service they experienced. Since Parasuraman et al. [9] builds a model about services quality (SERVQUAL) based on five fundamental dimensions (tangibles, reliability, responsiveness, assurance, empathy), a lot of studies have been examining service quality in this research area and found various independent variables. Service quality may be extended with continuing governance on the sustainable management. Sustainability is not only related to environmentally friendly economic activity, but also with continuous performance among the participating economic agents. In this paper, we define our sustainable management from the latter perspective. For the sustainable management of the O2O services such as Meituan food delivery business, the most important governance factors should be based on the common factors from diverse researches. From this perspective, Cho et al. [10] explored food delivery apps in China based on five dependent variables, namely convenience, design, trustworthiness, price, and variety of food choices, and further analyzed how these variables influence the perceived value and the intentions to continually use the app. Results show that the trust of the user is the most influential factor in the food delivery business. Jeong and Song [11] used the PLS method and explored the Korean O2O industry. They found that contextual offers, instant connectivity, web rooming, and economic efficiency positively influence the reuse intention of customers through perceived value. Sun and Lee [12], who examined the characteristics of O2O based on Chinese and Korean customers, proved that all of the characteristics of O2O positively influence attractiveness. Further, they proved that attractiveness and trust positively influence the intention of users. Heo and Kim [13] explored O2O service users of large retail stores and ascertained how offline service quality and O2O app service quality influence reuse intention. Results show that O2O app service quality, economy, instant connectivity, service platform, web rooming, and security positively influence perceived utility, ease of use and reuse intention. Even if these variables are not separately dealt with in terms of offline service quality, these variables are more frequently found in the favor of the online quality of the services, and thus we need more variables (speed and accuracy) to characterize the offline service quality as outstanding. Due to the appropriate size of the input variables, our research shall include

three online preferred service quality variables of convenience, economy, safety (security), as well as the off-line oriented variables of speed and accuracy, because O2O service quality should be based on the initiation of service and its implemented performance by the offline variables. This does not mean these variables are independently used only online or offline, but their focus shall be clarified on the questionnaires with online and offline-oriented characteristics.

Most of previous papers focused the online factors only, but this paper has harmonized these online variables with two offline variables in our study. The Meituan app needs to provide easier and more reliable access (convenience) with enhanced protection for money transfer or prevention of individual information leakage (safety) to increase the reuse intention of consumers; further, the app should provide long-term profit such as frequent mileage coupons (economy). Moreover, since consumers use the app for food delivery, their food must be delivered accurately (Accuracy) and at the earliest possible time (Speed). For the measurement of these variables, we used the categorical approach to the degree of perceived values by Likert scale, and thus the respondent shall evaluate the level of each variable in five categories from very strong to very weak. Based on the variables mentioned above, we propose the following hypotheses for the quality of O2O food delivery services.

Hypotheses 1 (H1). *The convenience of an O2O food delivery industry service positively influences the reuse intention.*

Hypotheses 2 (H2). *The safety of an O2O food delivery industry service positively influences reuse intention.*

Hypotheses 3 (H3). *The economics of an O2O food delivery industry service positively influences reuse intention.*

Hypotheses 4 (H4). *The accuracy of an O2O food delivery industry service positively influences reuse intention.*

Hypotheses 5 (H5). *The speed of an O2O food delivery industry service positively influences reuse intention.*

2.3. Customer Satisfaction as a Mediation Role on the Reuse Intention

As one of the core variables, customer satisfaction is generally measured by the difference between the expected and perceived values of a product or service that predict consumers' decisions [14]. Consumer Satisfaction can be defined as the feeling of being happy after comparing the realized performance of the product that is thought to deliver the expected return with its original expectation [15]. Meanwhile, Engel et al. [16] refer to the continuous use intention as the planned or predicted future use, based on subjective satisfaction with the consumption of the product. By exploring the relationship between the two variables, Oliver [17] concluded that the positive determinant of user attitude is customer satisfaction, which is the key factor of reuse intention. Choi and Sun [18] also found that consumer satisfaction with mobile payment service quality significantly positively influences their reuse intention. Likewise, Möhlmann [19] found satisfaction is a strong predictor of continuous reuse intention. However, in contrast to these studies, Morgeson and Petrescu [20] argued that depending on its perceived performance, the quality of the product (service) may have different effects and not result in a continuous purchase or reuse intention. Service quality may also have inter-relational impacts on reuse intention, and sometimes better quality of service does not always result in stronger reuse intention [21].

All of these arguments support the argument that customer satisfaction may mediate service quality and reuse intention. Therefore, it could be effective for O2O food delivery service quality if and only if customer perceived satisfaction is fully (or partially) mediated. This study proposes the following hypotheses regarding the mediator's role between the service quality of the O2O food delivery industry and reuse intention.

Hypotheses 6 (H6). *The convenience of O2O food delivery service positively influences customer satisfaction.*

Hypotheses 7 (H7). *The safety of O2O food delivery service positively influences customer satisfaction.*

Hypotheses 8 (H8). *The economic level of O2O food delivery service positively influences customer satisfaction.*

Hypotheses 9 (H9). *The accuracy of O2O food delivery service positively influences customer satisfaction.*

Hypotheses 10 (H10). *The speed of O2O food delivery service positively influences customer satisfaction.*

Hypotheses 11 (H11). *Customer satisfaction from an O2O food delivery service positively influences the reuse intention.*

Figure 3 presents our model framework through the abovementioned hypotheses. We set customer satisfaction as the mediating variable and tried to ascertain whether it affects the reuse intention. Therefore, in this research, we postulate the above hypotheses using direct and indirect models with reuse intention (direct model) and customer satisfaction as the mediator (indirect model).

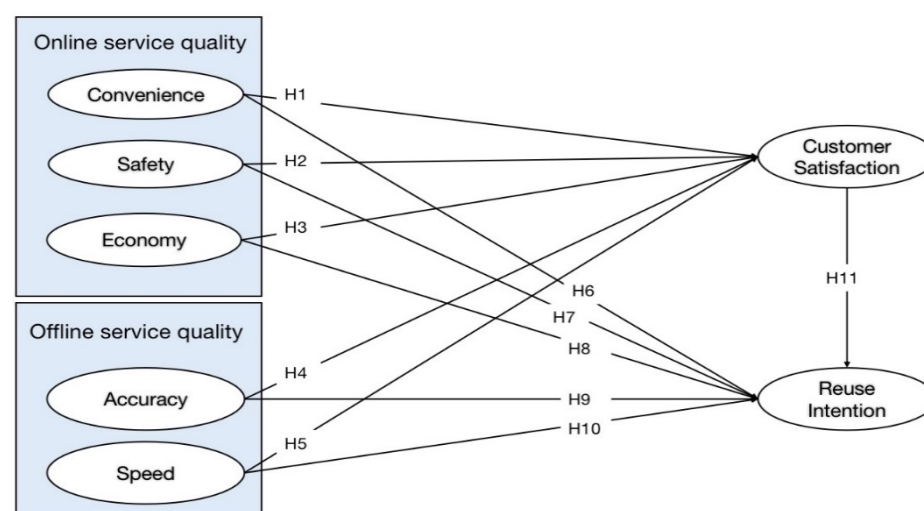


Figure 3. Proposed research model and hypotheses.

3. Data Collection and Research Methodology

3.1. Sources of Data Collection and Its Descriptive Statistics

To test the model and hypotheses, we used the online questionnaire platform Wenjuanxing to collect data in China for the period 10 July 2020 to 12 October 2020. This website is open to public response, and thus can avoid any bias on the region, or other user-related characters. If the user responds correctly without any systematical error, he or she will get little remuneration, which will enhance the response rate. Thus, as shown in Table 1, the distribution of the respondents is significantly diverse without any bias. After removing unusable or inappropriate responses (233) who had used the Meituan app., 500 questionnaires were finally obtained. Descriptive statistics for respondents are shown in Table 1. Users aged 20–30 and 30–40 accounted for 47.61% and 21.42% of the sample, respectively. This implied that young generations, who are familiar with smartphones, are the main users. Nonetheless, most members of these young generations support other family members, as more than 50% of the users place orders for three or more persons. This shows the strong potential for market growth.

Table 1. Descriptive statistics.

Characteristics		Items	Percentage
Gender	Male	238	47.61%
	Female	262	52.39%
Age	Under the age of 20	24	4.91%
	20–30	238	47.61%
	30–40	107	21.42%
	40–50	78	15.56%
	Over 50	53	10.5%
Average monthly income (RMB: Chinese currency)	Less than 2000 RMB	64	13.1%
	2000–5000 RMB	243	48.57%
	5000–8000 RMB	130	25.91%
	8000–10,000 RMB	33	6.55%
	More than 10,000 RMB	29	5.87%
Family members	Living alone	98	19.65%
	1 person	36	7.09%
	2 persons	106	21.28%
	3 persons	122	24.29%
	4 persons and more	138	27.69%
Monthly average usage	1–5 times	247	49.39%
	6–10 times	110	21.96%
	11–15 times	82	16.51%
	16–20 times	34	6.82%
	More than 20 times	27	5.32%
Monthly purchase amount (RMB)	Less than 50 RMB	82	16.37%
	50–100 RMB	141	28.24%
	100–300 RMB	156	31.11%
	300–500 RMB	82	16.37%
	More than 500 RMB	39	7.91%

3.2. Research Measurement

We adopted a five-point Likert scale, ranging from 1 (being considered “strongly disagree”) to 5 (being considered “strongly agree”) in this study, as all the previous SEM-based papers did [4,18,22]. Appendix A presents detailed measurement items. We used SPSS22.0 and AMOS22.0 to assess hypotheses about the relationship between variables.

4. Empirical Analysis

4.1. Reliability Test

To measure fitting justification of variables, the goodness-of-fit statistical test was used. Goodness-of-fit measures are a statistical hypothesis test to determine whether or not the sample’s data fit a given theoretical distribution and generally summarizes the difference between observed values and expected values in question. To test the model appropriateness, we used various goodness-of-fit indices such as the root mean square error of approximation (RMSEA), goodness-of-fit index (GFI), comparative goodness-of-fit index (CFI), and incremental goodness-of-fit index (IFI), as implemented by many researchers [22]. According to Table 2, the measurement model in terms of GFI is acceptable as the values of the goodness-of-fit indices of both models (direct and indirect) meet the recommended level.

Additionally, the proposed model must contain reliability and validity from a statistical perspective. When retested under similar conditions, the research model should show similar results; therefore, the complete consistency of measurement is assessed by the reliability test. This study adopted three widely known indices for the reliability test. These are the Cronbach’s alpha coefficient, the corrected item-total correlation coefficient, and the construct reliability coefficient, respectively [22]. The reliability test is shown in Table 3, which indicates that each measurement exceeds the recommended thresholds.

Table 2. The results of goodness-of-fit test.

Index	Recommendable	Direct Model	Indirect Model
χ^2/df	≤ 3	1.541	1.607
RMSEA	$\leq 0.05\sim 0.08$	0.033	0.035
GFI	≥ 0.9	0.942	0.928
CFI	≥ 0.9	0.953	0.941
IFI	≥ 0.9	0.954	0.941
AGFI	≥ 0.9	0.927	0.913

Table 3. Result of the latent variables' reliability test.

Variables	Number of Items	Cronbach's α (>0.6)	Corrected Item: Total	Construct
			Correlation (>0.5)	Reliability (>0.8)
Convenience	4	0.721	0.651–0.721	0.815
Safety	5	0.704	0.632–0.710	0.804
Economy	4	0.684	0.598–0.686	0.805
Accuracy	3	0.713	0.644–0.708	0.828
Speed	4	0.707	0.648–0.699	0.811
Customer Satisfaction	4	0.721	0.654–0.738	0.824
Reuse Intention	4	0.753	0.698–0.738	0.863

4.2. Validity Test

Validity refers to the accuracy of a measurement to the extent that an instrument accurately measures what it intends to measure. The components of content and concept validity are examined by validity analysis and the representativeness of the items in the questionnaire is tested by a content validity analysis. There was no response with misunderstandings in the pilot test, implying that the items (questions) are easy to understand for the interviewees, and thus result in good content validity [22].

Confirmatory factor analysis (CFA) was adopted in order to test how well the measured variables represent the number of constructs. Campbell and Fiske [23] expressed that construct validity data provide convergent validity and that similar measures of the same trait are provided by different assessment methods in which there should be moderately high construct values, ideally. On the other hand, independent assessment methods in discriminant validity indicate divergent measures of different traits, indicating that minimal convergence should be demonstrated by these values, ideally. When all the estimates of the standardized factor loadings (SFL) and the average variance extracted (AVE) of the items are significantly greater than the 0.5 cut-off point of their respective constructs, convergent validity occurs [22]. Table 4 presents the convergent validity results obtained with CFA. Here, all factor loadings and the AVE for all items are significant and greater than 0.5, indicating that the measurement scale indicates strong convergent validity.

The estimate of the standardized factor loadings (SFL) should be statistically above the threshold of 0.5, as suggested by Fornell and Larker [24]. Here, using the average variance extracted (AVE), the convergent validity of the constructs is assessed. As shown in Table 4, the AVEs of the seven constructs (convenience, safety, economic, accuracy, speed, customer satisfaction, and reuse intention) capture more than 50% of the variance of their observable measures above the critical value of 0.5. Thus, we infer that the convergent reliability of the constructions is acceptable. Meanwhile, the square root of the AVE for the constructs is greater than any of the corresponding inter-construct correlations, indicating that discriminant validity is accomplished. This discriminant validity is supported in Table 5.

Table 4. Convergent validity test on the measurement model.

Potential Variable	Items	SFL (Standardized Factor Loadings)	CR (Critical Ratio)	AVE
Convenience (Conv.)	Conv4	0.603	-	0.595
	Conv 3	0.603	7.420	
	Conv 2	0.685	8.027	
	Conv 1	0.682	8.004	
Safety (Safety)	Safety5	0.607	9.162	0.612
	Safety4	0.704	-	
	Safety3	0.651	9.788	
	Safety2	0.635	9.557	
	Safety1	0.656	9.850	
Economic (Economy)	Economy4	0.732	-	0.690
	Economy3	0.762	11.514	
	Economy2	0.774	11.655	
	Economy1	0.675	10.370	
Accuracy (Accuracy)	Accuracy3	0.756	10.384	0.680
	Accuracy2	0.688	9.703	
	Accuracy1	0.670	-	
Speed (Speed)	Speed4	0.673	-	0.648
	Speed3	0.671	9.486	
	Speed2	0.678	9.557	
	Speed1	0.655	9.298	
Customer Satisfaction (Satisfaction)	Satisfaction4	0.699	-	0.669
	Satisfaction3	0.690	9.160	
	Satisfaction2	0.657	8.862	
	Satisfaction1	0.732	9.509	
Reuse Intention (Re_use)	Re_use4	0.719	-	0.685
	Re_use3	0.677	10.555	
	Re_use2	0.727	12.474	
	Re_use1	0.724	12.445	

Note: Here subscript implies the individual question number. i.e., Conv1 means the first question for the convenience variable. All these questions are attached in Appendix A.

Table 5. Discriminant validity test of the measurement model.

Construct Items	Convenience	Safety	Economic	Accuracy	Speed	Customer Satisfaction	Reuse Intention
Convenience	0.771						
Safety	0.710	0.782					
Economic	0.506	0.730	0.831				
Accuracy	0.522	0.769	0.637	0.825			
Speed	0.476	0.641	0.649	0.726	0.805		
Customer Satisfaction	0.621	0.697	0.734	0.598	0.789	0.818	
Reuse Intention	0.506	0.628	0.692	0.493	0.720	0.778	0.828

4.3. Structural Model Result and Its Implication

In this section, we tested the research hypotheses after performing the reliability and validity tests in the previous section. To test the hypotheses, we used the maximum likelihood estimation method with the SEM method. Figure 4 shows the empirical result of the direct model excluding the mediator (customer satisfaction). The five service quality factors (convenience, safety, economy, accuracy, and speed) and the reuse intention of the direct model indicate that customers' purchase intention is positively influenced by all the service quality factors. Therefore, H1–H5 are supported with $p < 0.1$. These results show that the initial success of the O2O delivery service results from all kinds of service

characteristics in terms of online and offline perspectives. Among the coefficients, the speed factors of 0.694 indicate that they have the largest impact on reuse intention, while convenience has the lowest impact of 0.234 on reuse intention. Therefore, the primary purpose of using O2O delivery services from the consumer's perspective may be fast delivery, while the strategic variables should focus on convenience from the perspective of the O2O service provider. It is therefore noteworthy that most consumers use Meituan due to its "perceived convenience". However, in reality, the impact of convenience is too weak to ensure the best sustainable performance. Therefore, the O2O service provider should make more efforts to ensure that consumers are satisfied with the "perceived" convenience. In the next section, we shall further examine the path analysis with indirect effects to ascertain the role of consumer satisfaction as the mediator.

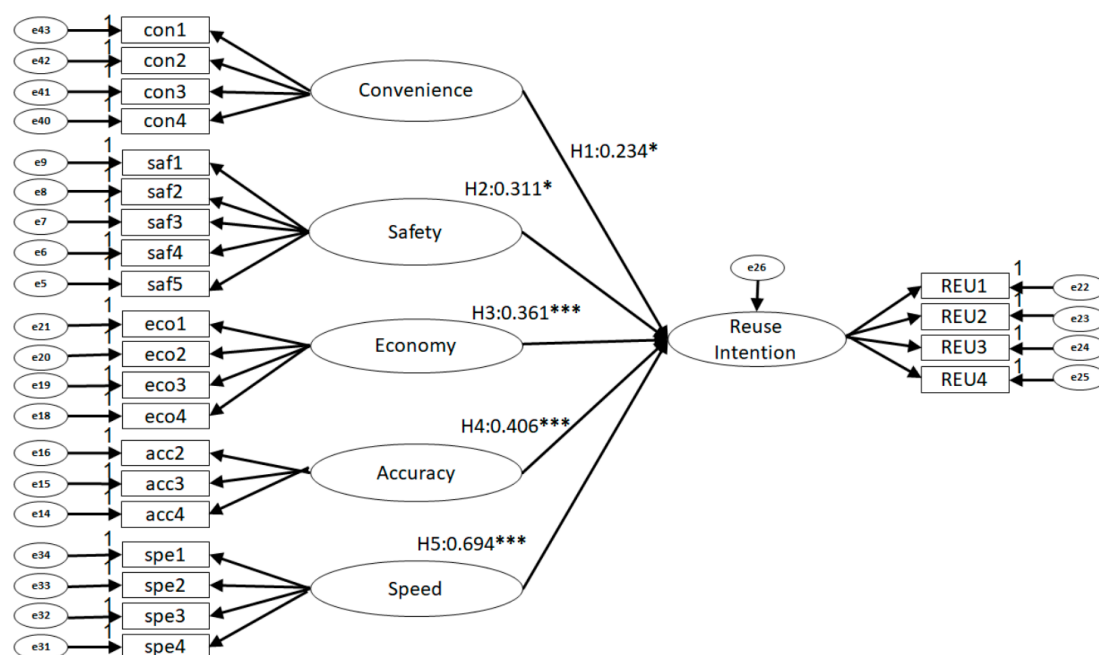


Figure 4. The results of the direct structural model. * denotes a level of 0.1, and *** denotes a level of 0.01.

To assess the mediating effect of customer satisfaction, we shall compare the direct effect and indirect effect with an intermediary variable under the relationships between the variables [25]. For comparison, the variables have to meet the following conditions: first, the independent variable should significantly influence the dependent variable and the mediator; second, the mediator must significantly influence the dependent variable; third, after taking into account the effects of the mediator, the impact of the independent variable on the dependent variable should decrease. The mediation will not take place if one of the above conditions is not met. If all of the conditions are met in the mediator's presence, and the influence of the independent variables becomes insignificant, then it can be considered that the effects of the independent variable are "completely" or "fully" mediated by the mediator. On the other hand, if the mediator meets all the conditions and the independent variable's influence remains significant, then the independent variable's effects are considered to be "partially" mediated [26]. Using the stepwise mediators of consumer satisfaction, we test the indirect model of the relationship between the Meituan food delivery app's service quality and reuse intention. As shown in Figure 5, the results imply that economy (H3) and speed (H5) directly and positively influence the reuse intention at the 90% significance level ($p < 0.1$) and have a significant positive effect on satisfaction. This implies that these two variables are partially mediated by satisfaction. With or without satisfaction, economy and speed factors influence reuse intention. Satisfaction is not necessary as a mediator, in this case, implying that consumers may reuse Meituan not because of satisfaction from economy and speed, but as an automatic response due to a lack of possible alternatives.

The lack of governance for the effective performance of Meituan is a grave issue because the economic factors and speed are the most important strategic variables for the online and offline service quality of O2O services, respectively. The consumers may choose Meituan because its perceived economy, which implies the perceived economic benefits such as a discount coupon for the next use, by a user, may result in satisfaction, and, therefore, it may be successful, at least in the initial stage. However, in the later stages, despite not being satisfied by the economic factors and speed, the consumers continue to use their services. Therefore, without the full support of satisfaction as the mediator, the economic factors and speed of O2O services are too vulnerable for sustainable management. The O2O service provider should customize the economic factors based on the consumers' orders and get feedback from the market and consumers to enhance their satisfaction over the reuse. Moreover, the consumers expect to get the food immediately, that is, as soon as they place an order. Unfortunately, in most cases, the consumers reused the service not because they were satisfied but rather because it was an automatic response. This represents a serious bottleneck in achieving the sustainable performance of O2O services. Therefore, the O2O service providers should make more precise and appropriate measures regarding the speed of the delivery. When a consumer places an order, they should get the food or real-time information about the delivery. Further, real-time delivery information should be factual. In case of a late or incorrect delivery, the O2O service provider should certainly compensate the customers accordingly. An appropriate impression is more important than the speed of delivery. Therefore, O2O service providers should customize their service for each specific order, as best impressions are not solely based on satisfaction with the delivery speed but also on the provider's perception.

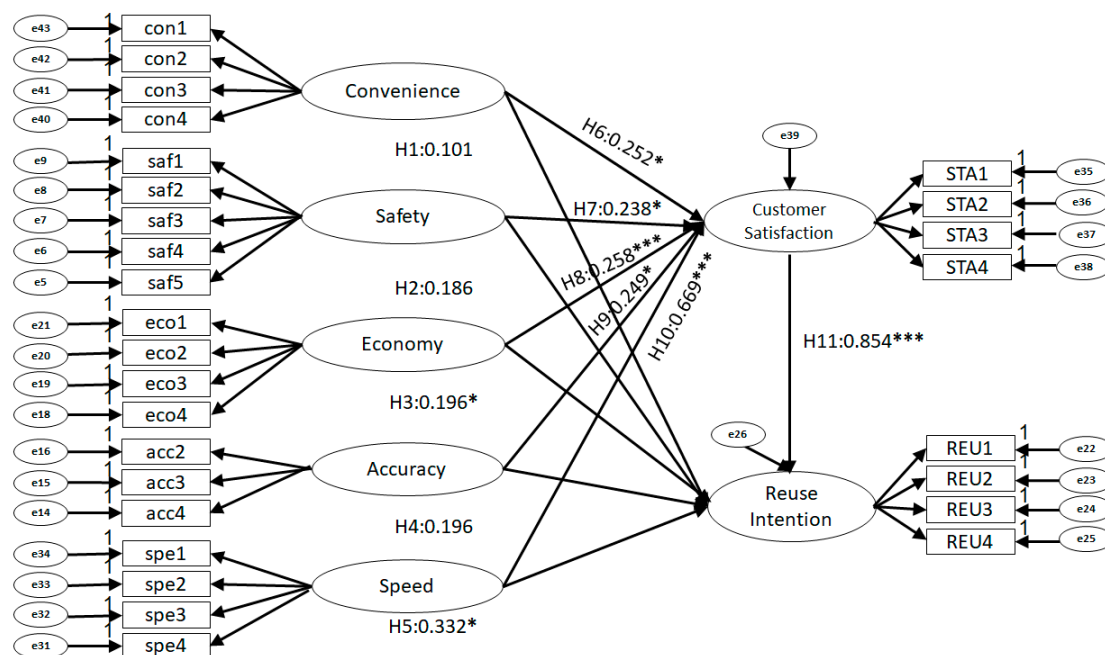


Figure 5. Results of the indirect structural model. * denotes a level of 0.1, and *** denotes a level of 0.01, respectively.

Conversely, convenience (H1), safety (H2), and accuracy (H4) positively but insignificantly influence reuse intention in Figure 5. In direct model shown in Figure 4, all these variables significantly affected on the reuse intention, while in this indirect model shown in Figure 5, these variables of convenience (H1), safety (H2), and accuracy (H3) are rejected as insignificant due to the diluting effect of the modulating variable of customer satisfaction.

However, they show a significant and positive impact on satisfaction. Therefore, via satisfaction, these three variables indirectly influence reuse intention. Therefore, three variables are fully mediated by consumer satisfaction. Since the full mediatory variables fit

the common sense of null hypotheses, these variables work very well as full mediators, even if the coefficients are a little stronger or weaker based on the reuse intention.

However, the partial mediators need to be strengthened for becoming full mediators. That's the reason for the Meituan to consider these partial variables seriously or strategically. We, therefore, conclude that economy and speed are the key strategic factors for 'Meituan Waimai' due to its partial mediated effect on consumer satisfaction as explained above.

5. Concluding Remarks and Policy Implications

The COVID-19 pandemic has lasted longer than a year. Consequently, more people have been using food delivery apps, and it is obvious that competition in the O2O food delivery industry will be more severe. Therefore, the O2O food delivery industry should create a service-oriented strategy to secure the sustainable performance of firms. Against this backdrop, we empirically analyzed how the service quality of the O2O app influenced the satisfaction and reuse intention of customers. The empirical results and implications are summarized as follows.

First, among online service quality, the economy is the most important strategic factor with a higher coefficient of 0.186. As discussed above, the economic factors are important for a consumer to choose a specific brand of O2O services. However, if the consumers reuse these O2O services because of automatic response rather than consumer satisfaction, they could be unsustainable. Therefore, the O2O service provider should put more effort into turning the partial role of satisfaction into a complete mediator. In order to enhance the role of satisfaction, O2O service providers should come up with more customized economic incentives as well. In the initial stage, the discount coupon, lower price, and other economic incentives may bring in initial success. However, for consumers to remain loyal to Meituan, the app should provide substantial qualitative economic incentives. One way of doing this is to open connectivity. When a consumer places an order, the O2O service provider such as Meituan should ensure that they provide complementary services for that specific consumer, such as an alcoholic drink, and cup and paper dishes, from the strategic alliances with convenience stores. For example, Yogiyo, a leading O2O food delivery company in Korea, has inaugurated "Yomart" as the complimentary service of their food delivery services. The consumers may place additional orders for diverse products from the convenience store. Therefore, Yogiyo delivers these products together with the food. This kind of customized qualitatively supporting the economic, convenient order system may give customized satisfaction for the consumer. Likewise, open connectivity may bring diverse business opportunities for O2O services based on artificial intelligence (AI) support of the database of consumers.

Second, speed is a key factor in the O2O business, especially from the offline perspective. However, it does not have a full mediating effect on consumer satisfaction in our research. Therefore, the current O2O service by Meituan is not sustainable because consumers may exhibit reuse intention despite being entirely dissatisfied, as shown in the indirect model. The consumer dissatisfaction with the O2O service speed may be attributed to the fact that their "perceived" speed is much faster, or the speed of the delivery is not enough to get the "right impression" about it. The consumers are ready to get the food as soon as they place orders. If the food is not ready, consumers should at least be provided real-time delivery information regarding how long they have to wait. Precise information on the exact delivery time is crucial. Therefore, the O2O service providers should compensate for any late or delayed deliveries. Another crucial factor is the appropriate impression of the delivery. Even if the consumers have their deliveries delayed, the appropriate impression through compensation and/or honest explanation about the late delivery may result in the loyalty of the consumer.

Third, as a mediating variable, customer satisfaction strongly influences reuse intention. Therefore, business leaders in O2O service must not only enhance service quality but also ensure that their services satisfy customers. For this purpose, a service provider should listen and receive feedback from their customers. Meituan and other O2O service

providers should treat consumers as partners to create value together, rather than passive helpers for the maximum profit of the company in the short-run.

This paper may have some limits to explore, especially in the Covid-19 pandemic era. It would be better if the model includes the issues about food safety and food fraud in relation to the success of this app. For example, consumers do not see how their food is being cooked, or whether correct hygiene conditions are being maintained at the place where the food is being prepared, which could lead to frequent cases of food poisoning. For example, food fraud could be happened if a consumer is served horsemeat curry when they ordered beef curry. Moreover, future research could answer some newly emerging questions under the Covid-19 pandemic era, such as: are Chinese users of the Meituan app more eager to use O2O in Pandemic?; is safety also perceived as safety of food preparation/deliveries, etc., or does it just refer to payment security and customer ID safety? These issues shall certainly improve the implications and suggestions of our research in the future.

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Appendix A

Strongly Disagree → Strongly Agree	1	2	3	4	5
1. Questions about Convenience					
Q1: It is easy and simple to use Meituan app.	1	2	3	4	5
Q2: Meituan app works well and without errors.	1	2	3	4	5
Q3: Payment is faster and simpler when purchasing products from the Meituan app.	1	2	3	4	5
Q4: Meituan app is easy to access at any time, any place.	1	2	3	4	5
2. Questions about safety					
Q1: Meituan app is more reliable than other competitors with regard to security.	1	2	3	4	5
Q2: Meituan app is trustful in system stability and security.	1	2	3	4	5
Q3: I don't need to worry about personal information leakage when using Meituan app.	1	2	3	4	5
Q4: The Meituan app ID and password of the customers are safely protected.	1	2	3	4	5
Q5: Meituan app cares about security more than other competitors do.	1	2	3	4	5
3. Questions about economy					
Q1: Meituan app provides diverse discount benefits such as coupons or promotion.	1	2	3	4	5
Q2: When purchasing using Meituan app, I can save more money as compared with other competitors.	1	2	3	4	5

Strongly Disagree→ Strongly Agree	1	2	3	4	5
Q3: When purchasing using the Meituan app, I can save more money as compared with the offline market.	1	2	3	4	5
Q4: Meituan app is cost-effective.	1	2	3	4	5
4. Questions about accuracy					
Q1: Meituan app delivers food on time and to the exact location.	1	2	3	4	5
Q2: Services and food delivered from Meituan are consistent with my expectation.	1	2	3	4	5
Q3: There is no mistake or flaw in the food delivered by Meituan.	1	2	3	4	5
5. Questions about speed					
Q1: Meituan app delivers food on time or earlier.	1	2	3	4	5
Q2: The waiting time of Meituan app is fine and acceptable as compared with its competitors.	1	2	3	4	5
Q3: Except meal time, the waiting time of Meituan app could be reduced.	1	2	3	4	5
Q4: The delivery speed of the Meituan app is faster than that of its competitors.	1	2	3	4	5
6. Questions about satisfaction					
Q1: I am satisfied with the use method of Meituan app.	1	2	3	4	5
Q2: Using Meituan app services is convenient and satisfactory compared with offline services.	1	2	3	4	5
Q3: I like Meituan app more than other competitors.	1	2	3	4	5
Q4: I am satisfied with the service provided by Meituan app.	1	2	3	4	5
7. Questions about reuse intention					
Q1: I will keep using Meituan app from now on.	1	2	3	4	5
Q2: I will recommend Meituan app to other people.	1	2	3	4	5
Q3: I am willing to use other services offered by Meituan app if any.	1	2	3	4	5
Q4: I will use Meituan app for three months.	1	2	3	4	5

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