

Predictors of continuance intention of online food delivery services: gender as moderator

Online food
delivery
services

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Abstract

Purpose – The COVID-19 has brought with it valuable opportunities for the retail sector. Notably, online channels have assumed a key role for businesses that can rely less on physical channels due to the pandemic's restrictions. Within this context, the study aims to identify the main antecedents leading to the formation of the male and female customers' continuance intention of using online food delivery services (OFDS) in the restaurant industry.

Design/methodology/approach – A web-based self-completion survey and a subsequent structural equation modelling have been employed on a sample of 360 participants.

Findings – Findings reveal that perceived healthiness, quarantine procedures, perceived hygiene, perceived ease of app use and attitude significantly influence continuance intention. Moreover, the moderator analysis corroborates that male consumers' continuance intention is mainly influenced by perceived healthiness, quarantine procedures and perceived hygiene. Conversely, female customers' continuance intention is predicated on perceived healthiness and attitude.

Research limitations/implications – Although the adoption of a sample of young customers (18–29 years) guarantees good research internal validity, findings are not generalizable.

Practical implications – The study provides valuable contributions for restaurants related to the (1) creation/management of their own OFDS platforms; (2) selection of the right third-party platforms.

Originality/value – The paper is one of the first studies examining the predictors impacting on customers' OFDS continuance intention in the COVID-19 context by also focusing on gender differences.

Keywords Online food delivery services, Continuance intention, COVID-19, Continuance intention antecedents, Gender, Moderator analysis

Paper type Research paper

1. Introduction

The COVID-19 pandemic has profoundly modified retailers' practices and consumers' buying behaviours (Zulauf *et al.*, 2021), thus bringing different businesses to face complex challenges (Belarmino *et al.*, 2021).

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The catering industry definitely represents one of the retail categories most affected by this crisis. Notably, restaurants have been forced to close for several months due to the different lockdown restrictions (Kumar and Shah, 2021). At once, these firms have also experienced a higher demand opportunity related to the possibility to serve their customers at home, thus delivering their products in an environment perceived by people as safer (Naeem, 2021; Roggeveen and Sethuraman, 2020). Against this background, the online food delivery services have assumed a key role, thus representing, in particular during the lockdown periods, the only connection between restaurants and their customers. Literature defines online food delivery services (OFDS) as easy and convenient tools for customers to buy food online, thus avoiding to physically go to the restaurant (Prasetyo *et al.*, 2021). Notably, they represent a combination between the traditional Food Delivery (FD) concept (i.e. orders are taken by phone to a specific restaurant and delivered by the restaurant's rider) and the advent of the digital tools (Seghezzi and Mangiaracina, 2021). Indeed, from this combination, a new business was originated, with restaurants able to expand their activity either by creating their firm-owned platforms (e.g. Restaurant-to-Consumer platforms; branded mobile apps) (Dirsehan and Cankat, 2021; Patsiotis *et al.*, 2020) or by joining to third-party ones (e.g. Platform-to-Consumers, such as Glovo and Deliveroo) (Dirsehan and Cankat, 2021; Kapoor and Vij, 2018; Petit *et al.*, 2022), which are "usually managed by independent companies that take orders from users, communicate with restaurants and carry out the food delivery activities using gig workers" (Troise *et al.*, 2021, p. 665). If before the COVID-19 crisis, European restaurants tended to use these services sporadically, with the rise of the pandemic, these businesses have been forced to massively adopt these tools in order to survive. From the customers' perspective, the COVID-19 emergency approached new clients to these services who had never ordered food at home through online delivery services or had not felt the necessity of using them (Just Eat, 2020). In particular, during 2020, the European interest toward the OFDS adoption rose by 140%, with Italy obtaining one of the best performances, equal to +180% (Reply, 2021). Moreover, the most active clients belong to the Millennials and Generation Z, while as regards gender, both men and women adopt OFDS in an almost completely balanced way (Just Eat, 2020).

Overall, these data enable to corroborate that the pandemic has profoundly transformed consumers' food consumption patterns by bringing people to increasingly use OFDS. This attitude, together with the feelings of anxiety/fear deriving from the perceived risk of infection during dinners out, has led and is leading people to opt for these services even in the stages of COVID-19 restrictions' reduction. Therefore, this means that the OFDS adoption will represent not only an outcome of the pandemic crisis but also a trend for years to come (Reply, 2021). In this respect, literature underlines the importance of identifying the main antecedents of customers' intention of continuing to use OFDS during and after the COVID-19 pandemic (Kartono and Tjahjadi, 2021).

Starting from these assumptions, the present study aims to explore the influence of different antecedents on the customers' continuance intention of using OFDS. Moreover, the research seeks to identify the possible role of gender as moderator. In particular, according to the extant literature, gender represents a demographic feature that usually influences customers' behaviours, especially for what concerns food consumption habits. Therefore, it could become crucial for restaurants to create specific marketing strategies based on this variable (Hwang and Kim, 2019).

With respect to the antecedents, the paper focuses on three areas. The first category of antecedents concerns the food safety area since, in a pandemic context, the food condition assumes a key role (Shim *et al.*, 2021). In this respect, perceived healthiness, perceived hygiene and quarantine procedures will be the object of the present research. The second group of predictors is strictly related to the pandemic situation, and it is composed of fear of COVID-19 and perceived risk of eating out. Indeed, the pandemic fear has led to the online retail development and, in particular, to the digital transition of food retailing (Kazancoglu and Demir, 2021) through the adoption of

OFDS (Belarmino *et al.*, 2021; Gavilan *et al.*, 2021). The third domain regards the effective usage of the OFDS, and it is composed by the ease of app use and attitude toward using OFDS.

Overall, by doing so, the paper offers significant theoretical and managerial contributions. Theoretically, it enriches the paucity of literature focused on OFDS in the COVID-19 context (Belarmino *et al.*, 2021), especially by identifying the main antecedents leading to the formation of the male and female customers' intention to continue to use OFDS. Secondly, the study focuses its attention on the analysis of costumers' behaviours in adopting the online technologies during a health crisis, thus enriching the extant literature mainly concentrated until now on other types of emergency situations (Kumar and Shah, 2021). Thirdly, it contributes to the research dedicated to the analysis of the effects of the COVID-19 on the dynamics of the world of retailing (Roggeveen and Sethuraman, 2021) by specifically focusing on the catering sector.

At the managerial level, the paper attempts to (1) investigate how restaurants can offer value to their customers through OFDS; (2) identify the most appropriate marketing and communication strategies based on gender differences.

The remainder of the study is structured as follows: while Section 2 offers the literature review, Section 3 presents the hypotheses development. Subsequently, Section 4 shows the methodology, and Section 5 analyses the empirical results. Finally, Section 6 concludes the study by debating the theoretical and managerial implications, limitations and directions for future research.

2. Literature review

This section first discusses the continuance intention conceptualization and its main antecedents previously analysed by both the general literature and that focused on the OFDS industry. The second part focuses its attention on the identification of the antecedents investigated in the present contribution (i.e. perceived healthiness, perceived hygiene, quarantine, fear of COVID-19, perceived risk of eating out, ease of app use and attitude), along with the motivations that led to select them and their conceptualization.

2.1 *Continuance intention and its antecedents in the OFDS context*

Continuance intention represents a positive post-use behaviour (Okazaki *et al.*, 2020), and it can be defined as the individuals' intention to continue using/buying a brand, product or service after its initial acceptance (Kumar and Shah, 2021). Notably, research has focused its attention on this variable, especially by analysing its antecedents in specific sectors such as sharing services (e.g. Eugene Cheng-Xi *et al.*, 2018), mobile and social apps/services (e.g. Qing and Haiying, 2021), Internet banking (e.g. Rahi and Ghani, 2019), video-games and entertainment (e.g. Patzer *et al.*, 2020), cloud and information systems (e.g. Cheng, 2020), crowdsourcing platforms (e.g. Wang and Wang, 2019), e-government services (e.g. Puthur *et al.*, 2020), financial services (e.g. Zhou *et al.*, 2018), education and e-learning platforms (e.g. Daneji *et al.*, 2019) and online shopping (e.g. Luo and Ye, 2019).

By specifically focusing on the OFDS sector, some studies have analysed the continuance intention antecedents in the context of the COVID-19 pandemic. In particular, Jun *et al.* (2022) detect how perceived usefulness, enjoyment, trust and customer attitude affect OFDS continuance intention. Moreover, Troise *et al.* (2021) hypothesize how attitude, perceived usefulness, perceived behaviour control, subjective norms and trust in online food delivery services influence customers' intention to use them. In their contribution, Hong *et al.* (2021) identify how perceived usefulness represents the most influential factor affecting customer intention to use OFDS during the COVID-19 pandemic.

In the present study, the following antecedents will be analysed: perceived healthiness, perceived hygiene, quarantine, fear of COVID-19, perceived risk of eating out, ease of app use and attitude.

More in detail, perceived healthiness, perceived hygiene and quarantine have been chosen since they represent three variables strictly related to the food safety topic: an area that assumes a key role in a pandemic context (Shim *et al.*, 2021). Conceptually, while healthiness can be defined as how the offered products are useful in promoting consumers' health, hygiene can be conceptualized as "how consumers perceive the product in terms of being clean and safe" (Shim *et al.*, 2021, p. 13). For what concerns quarantine, during the COVID-19 pandemic, it has assumed a key role, especially in the foodservice industry. Notably, quarantine can be defined as how an activity or a service manages the quarantine procedure in order to protect customers' health against COVID-19 (Shim *et al.*, 2021).

With regards to the second group of predictors (i.e. fear of COVID-19 and perceived risk of eating out), we selected them because they are specifically related to the current pandemic situation. In particular, at international level, the COVID-19 crisis has provoked multiple consequences. Between them, the formation of feelings of fears, among people, represents one of the most diffused (Erjavec and Manfreda, 2022; Halan, 2021). Conceptually, Jian *et al.* (2020) define fear of COVID-19 as a negative emotion composed by anxiety and depression which derive from the awareness of the potential consequences of the virus. By specifically focusing on the influence of fear of COVID-19 on the OFDS use, research highlights the importance of extending the examination of this variable on the customers' food consumption habits, behaviours and decision-process (Gavilan *et al.*, 2021). Indeed, in crisis' periods, individuals tend to manifest specific types of behaviours (i.e. panic-buying ones) as a natural consequence of fear and uncertainty (Kazancoglu and Demir, 2021; Prentice *et al.*, 2020). Another driver impacting on consumers' behaviours and intentions is represented by their perceived risk (Halan, 2021; Rather, 2021). With reference to OFDS, the perceived risk of eating out has brought people to choose them more and more often since they represent services able to "shift consumption to safer, more controlled environments, such as the home" (Gavilan *et al.*, 2021, p. 2).

Finally, ease of app use and attitude toward using OFDS belong to the third group of variables. Firstly, perceived ease of use can be defined as "the degree to which a person believes that using a technology will be effortless" (Castillo and Bigne, 2021, p. 879). By specifically focusing on the impact of ease of technology, and in particular mobile apps and services, on the customers' behaviours and intention, literature has widely investigated this connection in different sectors (Alt *et al.*, 2021; Bhatt, 2022; Mew and Millan, 2021; Shim *et al.*, 2021; Van Dolen *et al.*, 2007; Wiese and Humbani, 2020; Zhu *et al.*, 2022), with the majority of findings corroborating a positive impact of ease of use on continuance intention (Assimakopoulos *et al.*, 2017; Demoulin and Djelassi, 2016; Thomas-Francois and Somogyi, 2022). Secondly, attitude can be defined as the way in which an individual feels about and is predisposed towards a certain object, idea, product or service (Liaw, 2002). By concentrating on the impact of attitude on continuance intention, research underlines how attitude represents a key contributing factor for continuance intention (Kartono and Tjahjaji, 2021) since an individual showing a positive attitude toward a product/service will be more likely to continue using it (Yeo *et al.*, 2017).

3. Hypotheses development

3.1 Perceived healthiness, hygiene and quarantine procedures

By strongly influencing health conditions, both perceived healthiness and perceived hygiene assume a key role in the formation of individuals' decision making (Shim *et al.*, 2021). In this respect, several studies analysed the impact of food safety on consumers' decision making (Shim *et al.*, 2021).

Focusing on healthiness, Kim *et al.* (2013) find that perceived food healthiness, by increasing customers' satisfaction, impacts on costumers' revisit intention toward

restaurants. More recently, while [Medina-Molina and Pérez-González \(2021\)](#) analyse the relationship between perceived healthiness and repurchase intention in the context of nutritional labelling, [Shim et al. \(2021\)](#) investigate the positive impact of products' healthiness on customers' purchase intention in coffee services.

Starting from these previous studies, it could be hypothesized an equivalent relationship in the OFDS context, thus assuming that the products' perceived healthiness, offered by an OFDS, can have a positive impact on the customers' intention to continue to use it. Therefore, the first hypothesis has been formulated:

H1. Perceived healthiness leads to continuance intention.

As regards hygiene, literature underlines how, especially during the COVID-19 pandemic, customers have become increasingly attentive to the social distancing and hygiene ([Kazancoglu and Demir, 2021](#)) since they are particularly concerned about the risk of having a contact with contaminated food or infected delivery personnel. In this respect, OFDS guarantee different sanitation procedures such as safety and hygiene measures in food processing, handling and delivery, the adoption of contactless delivery, and electronic payments ([Al Amin et al., 2021](#)).

From an empirical perspective, [Al Amin et al. \(2021\)](#) corroborate the positive impact of food delivery hygiene on the continuance intention to use mobile food delivery applications during the COVID-19 pandemic. Moreover, [Shim et al. \(2021\)](#) find a positive relationship between hygiene and customers' purchase intention in coffee services.

Based on these previous results, it could be assumed that there was a positive impact of customers' perceived hygiene concerning the OFDS on their continuance intention of using it. Thus:

H2. Perceived hygiene leads to continuance intention.

Moreover, with the advent of the COVID-19 pandemic, social life behaviours have profoundly changed by especially influencing eating-out habits ([Shim et al., 2021](#)). In particular, people have become ever more worried about the risk of being infected during eating and talking moments. Therefore, quarantine procedures have currently assumed a crucial role in the formation of customers' satisfaction, especially in the context of the foodservice industry.

However, despite the relevance of these measures, just one study ([Shim et al., 2021](#)) has analysed the impact of quarantine on consumers' food behaviour and decision making in coffee services, thus hypothesizing a positive impact of quarantine procedures on customers' purchase intention. Starting from this study, we could assume a similar result in the OFDS context by proposing the following hypothesis:

H3. Quarantine procedures lead to continuance intention.

3.2 Fear of COVID-19 and perceived risk of eating out during COVID-19

According to the extant research, fear of COVID-19 and the perceived risk of eating out have brought individuals to assume new habits, behaviours and intentions ([Halan, 2021](#); [Rather, 2021](#); [Tran, 2021](#)), such as the inclination to prefer smaller networks of friends, more time spent at home and the growing use of OFDS. Consequently, these services have become ever more popular and adopted by consumers as the main substitute for dining out ([Al Amin et al., 2020](#); [Belarmino et al., 2021](#)).

Starting from these assumptions and from the fact that, generally, the customers' adoption and experience with a product/service can lead them to continue to adopt it ([Chen and Yang, 2021](#)), it could be assumed there would be a positive impact of the fear of COVID-19 and the perceived risk of eating out during COVID-19 on customers' intention of continuing to use OFDS.

Thus:

H4. Fear of COVID-19 leads to continuance intention.

H5. Perceived risk of eating out leads to continuance intention.

3.3 *Perceived ease of app use and attitude toward using OFDS*

By specifically focusing on the OFDS context, some studies have analysed the influence of perceived ease of app use on customers' continuance intention. In particular, [Fakfar \(2021\)](#) corroborates that the ease of food delivery applications leads to customers' satisfaction which, in turn reveals their intention to re-use the service. In their study, [Zhuang et al. \(2021\)](#) identify a positive relationship between ease of using food delivery apps and overall service quality, customer satisfaction and continuance intention. Similarly, [Choi \(2020\)](#) finds a positive impact of perceived ease of food delivery app use on customers' satisfaction with the delivery service which, in turn, leads to reuse intention.

Starting from these previous studies, it could be assumed that there was a positive impact of perceived ease of OFDS apps use on customers' intention of continuing to use these services. Therefore, the following hypothesis has been postulated:

H6. Perceived ease of app use leads to continuance intention.

For what concerns the impact of attitude toward using OFDS on continuance intention, research confirms this relationship in the context of COVID-19 also ([Zhu et al., 2022](#)). However, the majority of it has analysed this connection in other sectors such as mobile health applications (e.g. [Birkmeyer et al., 2021](#)), web-based videoconferencing and online learning (e.g. [Mo et al., 2021](#)) and cruise services (e.g. [Pan et al., 2021](#)).

By specifically focusing on OFDS, [Al Amin et al. \(2021\)](#) and [Troise et al. \(2021\)](#) corroborate a positive influence of the consumers' attitude toward using online delivery services on their intention to continue to adopt them. Based on these previous studies, we formulated the last hypothesis:

H7. Attitude toward using OFDS leads to continuance intention.

3.4 *The moderating influence of gender*

Extant literature corroborates that the consumption habits and intentions are particularly affected by demographic features, especially the gender ([Faqih and Jaradat, 2015](#)). In particular, marketing research has deeply analysed the role of gender as a social construct able to significantly influence customers' behaviours. Several studies have analysed in more detail the moderator role of gender in influencing consumer habits in different service contexts such as the tourism (e.g. [Iranmanesh et al., 2018](#)), financial and banking (e.g. [Zhao et al., 2018](#)), mobile (e.g. [Leon, 2018](#)), retail (e.g. [Powers et al., 2018](#)), cloud and web (e.g. [Tsichla et al., 2016](#)).

By focusing on the OFDS, some studies have analysed the influence of gender on customers' behaviours and intentions. Notably, by focusing on green consumption, [Hwang and Kim \(2019\)](#) find that gender moderates the relationship between customers' attitude toward using drone food delivery services and word-of-mouth intentions. In particular, the path coefficient for the male group has been found to be higher than for the female one. Similarly, [Hwang et al. \(2019\)](#) detect how gender moderates the relationship between (1) product innovativeness and intention to use and (2) attitude toward using drone food delivery services and word-of-mouth intentions. Both path coefficients for the female group have proved to be greater than for the male group.

With regards to the COVID-19 context, [Ali et al. \(2021\)](#) find that the effect of optimism, innovativeness, adoption intention and situation influences (COVID-19) on customers'

intention to use OFDS is stronger for males with respect to females. Conversely, the negative influence of insecurity and discomfort is stronger for the female group than the male one.

In their study, [Hwang and Kim \(2021\)](#) corroborate the moderating role of gender in the relationship between desire and behavioural intentions in the context of drone food delivery services. More specifically, the path coefficient for the male group turned out to be higher than the female group's one.

Starting from these previous researches and from the fact that the perception of a service can vary according to gender ([Hwang and Kim, 2021](#)), in the present study, its influence on the relationship between the proposed determinants and continuance intention will be examined.

Thus, the following research question has been formulated:

RQ1. Does gender moderate the influence of the proposed determinants on continuance intention?

[Figure 1](#) depicts the overall model under investigation.

4. Methodology

Data have been collected from 360 university students through the adoption of a web-based self-completion survey. Based on the fact that (1) young people tend to shop online more than other age groups ([Lubis, 2018](#)); (2) the most active customers of OFDS belong to young segments ([Just Eat, 2020](#); [Tech, 2020](#)), this specific target has been selected for the analysis. Young people are defined to be under 29 years old [1]. Therefore, Italian university students have been chosen since they are viewed as representative of people under 30 years old ([Savelli et al., 2019](#)).

The translation-back-translation method was employed to conduct the survey in the Italian language. Then, a professional platform for surveys (Google Form) has been adopted for the survey administration.

In particular, in the first part of the survey, participants were asked to indicate a specific OFDS brand they had used during the pandemic period. From that point on, participants

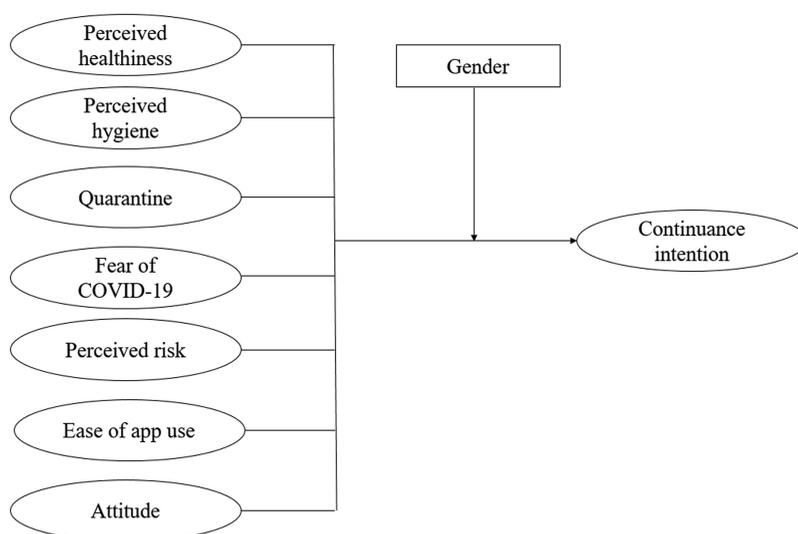


Figure 1.
Conceptual model

were requested to respond to each question, always thinking about that specific service brand they mentioned before.

Moreover, in order to avoid potential biases, several recommendations of MacKenzie and Podsakof (2012) have been adopted. Firstly, to minimize social desirability bias, the complete anonymity and confidentiality of responses have been guaranteed through a declaration inserted in the introductory part of the online survey. Secondly, respondents have been assured that there are no right or wrong responses and that they could have dissimilar opinions about the investigated topics. Finally, in the introductory part, it has been conveyed to the participants to avoid any potential disturbance factors since some of the questions were personal.

Overall, after eliminating incomplete responses and discarding respondents with a uniform response style (Völckner *et al.*, 2010), we ended up with 360 valid responses. The sample constituted 34% male respondents and 66% female respondents between 18 and 29 years. With a total of 360 respondents, the sample is above the rule of 200 and the sample to item ratio is 12.4, which is higher than the acceptable ratio of 5:1 (Gorsuch, 1983). Thus, an adequate sample size is achieved. Kaiser-Meyer-Olkin (KMO) as well as Bartlett's Test of Sphericity to measure sampling adequacy are calculated. KMO is 0.873 (> than 0.5) and Bartlett's Test of Sphericity is significant at 0.000 (below $p < 0.05$), therefore, both values are over the threshold and the data is suitable for factor analysis.

For the operationalization of the constructs, we employed existing and empirically validated scales. Survey respondents were asked to indicate their level of agreement for each of the items using a seven-point Likert scale, anchored by totally disagree (1) to totally agree (7). Table A1 contains the complete list of the items, Cronbach's alpha for each scale and the source adopted for each construct.

5. Results

5.1 Validity and reliability tests

Several analyses were conducted to test our model. Exploratory factor analysis, confirmatory factor analysis and structural equation modelling are used to address the hypotheses. Employing principal factor analysis showed that items measuring fear of COVID-19 and perceived risk of eating out during COVID-19 loaded on a common factor. Therefore, the two constructs were combined to one named "fear and risk of COVID". Items belonging to the constructs hygiene and quarantine also loaded on a common factor. Thus, we combined them to a single factor named "hygiene and quarantine". Overall, the six resulting factors explain 75.5% cumulative variance. None of the 29 items had significant cross-loadings (>0.50). All scales are reliable with Cronbach's alpha values higher than 0.8 (see Appendix).

The constructs' convergent and discriminant validity was assessed through a confirmatory factor analysis. Average variance extracted (AVE) and composite reliability (CR) form convergent validity. To obtain convergent and discriminant validity, the AVE should be > 0.40 (Floyd and Widaman, 1995) and the CR > 0.60 (Bagozzi and Yi, 1988). AVE values are between 0.56 (fear and risk of COVID) and 0.85 (ease of app use) and CR values range between 0.88 (healthiness) and 0.94 (ease of app use). Thus, all AVE and CR values are acceptable.

Discriminant validity is established by comparing AVE values need with the squared inter-construct correlation estimates (SIC). Details for means and standard deviations of the constructs, as well as AVE, CR and SIC values, are displayed in Table 1.

We also tested for significant differences between women and men on our variables in the model. Only one significant difference is found for fear and risk of COVID-19 ($t(357) = 7.05$, $p < 0.001$). Women ($m = 3.98$; $SD = 1.39$) have a higher fear and risk perception of COVID-19 than men ($m = 2.94$; $SD = 1.28$).

5.2 Fit of the measurement model

The measurement model was tested to determine its fit to the research data. Test of the fit of the measurement model (for male and female consumers) indicates that the measurement model has an acceptable fit ($\chi^2 = 1362.37$; $df = 702$; $p < 0.001$; $\chi^2/df = 1.94$; CFI = 0.93; IFI = 0.93; TLI = 0.92; RMSEA = 0.051). Hence, our measurement model possesses configural invariance.

For a meaningful comparison of the model for both male and female consumers, the instrument measuring the various constructs must possess cross-gender equivalence. To meet the requirement of equivalence, configural and, at least partial, metric or scalar invariances must be confirmed to compare the findings for the two groups of consumers (Hair *et al.*, 2006; Vandenberg and Lance, 2000; Steenkamp and Baumgartner, 1998).

Metric invariance was tested by means of multiple-group SEM. For the model there is no significant difference in χ^2 between the free and the restricted model (i.e. factor loadings restricted to being equal across genders). Thus, metric invariance can be assumed.

5.3 Test of the model

By looking at the equality of structural weights, the significance of the overall difference in the factors influencing continuance intention of using a delivery service of both male and female consumers was determined. The path coefficients, as well as the results of testing the change in fit as a consequence of constraining each structural weight to be equal across genders, are reported in Table 2.

Overall, our model shows that perceived healthiness ($\beta = 0.23$, $p < 0.001$), quarantine and perceived hygiene ($\beta = 0.15$, $p = 0.034$), ease of app use ($\beta = 0.17$, $p = 0.001$) and attitude ($\beta = 0.26$, $p < 0.001$) have a significant effect on continuance intention, while fear and risk of COVID-19 ($\beta = 0.09$, $p = 0.067$) is not significant at the 0.05 level, but at the 0.10 level; thus, our hypotheses are confirmed.

The moderator analysis reveals that male consumers' continuance intention is influenced by perceived healthiness ($\beta = 0.26$, $p = 0.019$), quarantine and perceived hygiene ($\beta = 0.21$, $p = 0.008$) and perceived ease of app usage ($\beta = 0.26$, $p = 0.005$). Fear and risk perception ($\beta = 0.11$, $p = 0.190$) and attitude ($\beta = 0.15$, $p = 0.114$) play a minor role. While among female consumers, their continuance intention is predicated on the following factors: perceived healthiness ($\beta = 0.21$, $p = 0.005$), attitude ($\beta = 0.26$, $p < 0.001$) and to a minor extent, ease of app usage ($\beta = 0.13$, $p = 0.043$). Quarantine and perceived hygiene ($\beta = 0.11$, $p = 0.177$) as well as fear and risk of COVID-19 ($\beta = 0.09$, $p = 0.131$) have no influence on the continuance intention of female customers. The χ^2 difference test shows that none of the differences though is significant. The final results are displayed in Figure 2.

Construct	Mean (SD)	CR	AVE	SIC				
		(>0.60)	(>0.40)	1	2	3	4	5
1. Attitude	5.99 (1.04)	0.93	0.77					
2. Healthiness	3.40 (1.19)	0.88	0.65	0.06				
3. Hygiene and quarantine	5.17 (1.00)	0.93	0.64	0.18	0.19			
4. Ease of app use	6.03 (1.00)	0.94	0.85	0.08	0.03	0.15		
5. Continuance intention	4.32 (1.41)	0.89	0.73	0.20	0.17	0.19	0.12	
6. Fear and risk of COVID	3.63 (1.44)	0.89	0.56	0.06	0.02	0.00	0.00	0.04

Table 1.
Reliability and
validity tests

Table 2.
Standardized
parameter estimates of
the structural model

Parameters	Overall model $R^2 = 0.352$	Female consumers $R^2 = 0.323$	Male consumers $R^2 = 0.440$	Difference
H1: Healthiness → continuance intention	0.23***	0.21**	0.26*	-0.05 ^{ns}
H2 and H3: Quarantine and hygiene → continuance intention	0.15*	0.11 ^{ns}	0.21*	-0.10 ^{ns}
H4: Ease of app usage → continuance intention	0.17**	0.13*	0.26**	-0.13 ^{ns}
H5 and H6: Fear and risk of COVID → continuance intention	0.09 [†]	0.09 ^{ns}	0.11 ^{ns}	-0.02 ^{ns}
H7: Attitude → continuance intention	0.26***	0.30***	0.15 ^{ns}	0.15 ^{ns}

Note(s): [†] $p < 0.100$; * $p < 0.050$; ** $p < 0.010$; *** $p < 0.001$; ^{ns}non significant

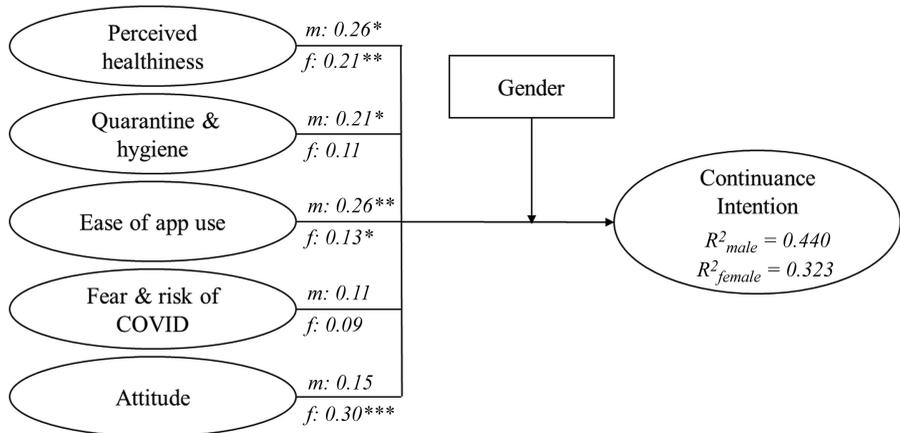


Figure 2.
Results of the model

5.4 Discussion of the results

Overall, results identified (1) a significant impact of perceived healthiness, quarantine procedures, perceived hygiene, perceived ease of app use and attitude on continuance intention; (2) a significant influence at 0.10 level of fear of COVID-19 and perceived risk on continuance intention.

More in detail, with regards to perceived healthiness, findings allow to detect how the products' perceived healthiness, offered by an OFDS, has a positive influence on the customers' intention to continue to use it. In this respect, the results confirm the existing research analysing the significant impact of perceived healthiness on consumers' decision making (Kim *et al.*, 2013; Medina-Molina and Pérez-González, 2021; Shim *et al.*, 2021).

Moreover, findings identify a positive influence of quarantine procedures and perceived hygiene on continuance intention, thus highlighting how these predictors assume a key role in the formation of customers' intentions to continue using OFDS during the pandemic crisis. Therefore, this result corroborates previous studies underlying the impact of hygiene and quarantine procedures on customers' behaviours, especially in the delivery food sector (Al Amin *et al.*, 2021; Shim *et al.*, 2021).

For what concerns the influence of fear of COVID-19 and perceived risk, the study confirms the impact (even if marginal) of these antecedents on the continuance intention, thus corroborating that the feelings of anxiety and fear provoked by the pandemic context, along with the perceived risk of contracting the virus during dinners out, have brought individuals to make greater use of OFDS (Halan, 2021; Rather, 2021; Tran, 2021) by consequently leading them to continue to adopt these services in the future.

Regarding the perceived ease of app use, results confirm previous studies (Choi, 2020; Fakfar, 2021; Zhuang *et al.*, 2021), thus detecting that the perceived easiness of apps can have a positive impact on customers' intention to use them in the future.

Furthermore, results confirm extant researches underlying the key role of attitude as an antecedent of customers' continuance intention (Hamari, 2015), especially in the OFDS sector (Kartono and Tjahjadi, 2021; Yeo *et al.*, 2017). By specifically focusing on the COVID-19 context, the present study corroborates that the individuals' formation of a positive attitude toward OFDS (potentially enhanced by the customers' feelings of fear and risk related to the health crisis) can lead to a more robust intention to continue using them during and after the pandemic situation.

Finally, for what concerns the moderator analysis, findings reveal that the male consumers' intention is affected by perceived healthiness, quarantine procedures, perceived hygiene and perceived ease of app usage, while fear, risk perception and attitude play a minor role.

Conversely, regarding female consumers, perceived healthiness, attitude and to a minor extent, perceived ease of app usage represent the antecedents influencing their continuance intention.

Overall, the perceived healthiness represents, for both men and women, a significant antecedent of their continuance intention. Conversely, an unexpected result concerns the greater significance of perceived hygiene and quarantine procedures on male consumers' continuance intention than on female one. Indeed, previous studies (e.g. Untaru and Han, 2021) have identified how women tend to be more attentive to public health and hygiene measures with respect to men. A possible explanation could lie in the fact that, in Europe, the COVID-19 has affected men more than women (Ahrenfeldt *et al.*, 2021). Therefore, this could have led men to have a greater fear related to the contagion by consequently increasing their attention toward hygiene and quarantine measures.

The last remarkable difference concerns the attitude factor, which is much more significant for women than for men. Therefore, this result allows to confirm how women tend to be more routine-seeking than men in their food consumption habits in the context of COVID-19.

6. Implications, limitations and future research

6.1 Theoretical implications

The paper provides different theoretical contributions. Firstly, it enriches the paucity of research focused on the OFDS in the context of COVID-19. Indeed, since the numbers of OFDS users and the time spent on those platforms have significantly augmented, it has become crucial to analyse the main factors bringing customers to use OFDS during the crisis (Belarmino *et al.*, 2021). In this way, the paper seeks to respond to the following calls of the literature related to (1) the analysis of the main antecedents leading to the customers' intention to continue using OFDS (Kartono and Tjahjadi, 2021); (2) the identification of the ways in which restaurants can offer value to consumers through delivery services (Belarmino *et al.*, 2021; Gunden *et al.*, 2020).

Secondly, the study provides a novelty by analysing the moderating role of gender in the relationship between the proposed determinants and continuance intention.

Thirdly, by investigating the main predictors determining the young consumers' continuance intention of OFDS in the COVID-19 context, the paper enhances the study of the attitudes and behaviours of a specific segment (i.e. people aged between 18–29 years) in using the online technologies during a health crisis, thus strengthening the extant research mainly focused on other typologies of crisis situations (Kumar and Shah, 2021).

Finally, it focuses its attention on a retail category that has particularly suffered the pandemic's effects, thus deepening the researches dedicated to the study of the COVID-19's influence on the retailing world's dynamics (Roggeveen and Sethurman, 2021). More in detail, as stated by the literature (Kazancoglu and Demir, 2021), digital media could assume a key role in facing the negative consequences of the virus. Consequently, retailer stores need to empower, in the long term, their online delivery services since consumers could massively adopt them even when the crisis will be over. Within this scenario, the further contribution of the paper is to investigate the influence of specific antecedents (i.e. perceived healthiness, quarantine and perceived hygiene, ease of app use, fear and risk of COVID-19 and attitude) on the formation of the male and female OFDS's continuance intention in the context of online retailing during the COVID-19 pandemic. This allowed identifying the main predictors restaurants should focus on in order to enhance the customers' intention to continue to buy from them through the online delivery services.

6.2 Managerial implications

This paper investigates a very interesting retail business since the catering sector represents one of the industries most influenced by the COVID-19 crisis. In particular, the study offers a practical understanding related to the possible strategies adoptable by restaurants mainly targeting customers between 18 and 29 years old in order to strengthen their young customers' intention to continue to buy from them by using the online delivery services. By identifying the main antecedents leading young customers to continue to adopt OFDS, the study allows to identify how restaurant managers can (1) improve their marketing strategies concerning their own OFDS; (2) select the right third-party platforms based on the presence/absence of the identified predictors.

Starting from the fact that perceived healthiness, perceived hygiene and quarantine, fear and risk of COVID-19, perceived ease of app use and attitude toward using OFDS turned out to have an influence on continuance intention, all these aspects should be particularly managed.

For what concerns perceived healthiness, it could be important to select a third-party platform or create an own platform able to communicate the healthy menus offered by the restaurant (e.g. light food options, fresh and organic ingredients, complete information sheets concerning food/nutrition details, such as ingredients, calories, allergens).

With regards to perceived hygiene and quarantine procedures, also in this case, all the sanitation measures should be communicated to the customers (e.g. guidelines concerning food preparation, details concerning the safety of the packaging and delivery process, information related to the quarantine procedures adopted in the kitchens). Indeed, literature corroborates that individuals are becoming more and more interested in marketing messages based on both safety and hygiene-centric language; therefore, it becomes fundamental to prioritize consumers' safety urges (Kazancoglu and Demir, 2021). In particular, ever more retailers are adopting automated delivery tools in order to minimize human contacts (Shankar *et al.*, 2021) and ensure high levels of hygiene. For instance, Domino's Pizza has adopted the touchless transfer that is a retail technology allowing to avoid that food is touched by a human, "from the moment it goes into the oven until it is delivered to the customer's doorstep" (Roggeveen and Sethuraman, 2020, p. 303).

With respect to the impact of fear of COVID-19 and perceived risk on continuance intention, it becomes crucial to create advertising contents (conveyed through traditional and social media tools) that leverage the feelings of fear related to the virus by also underlining how the OFDS can solve these concerns through careful sanitization processes and the possibility of eating in safer places such as one's home environment. Indeed, research underlines how many consumers will be, also in the future, cautious of being in enclosed places until the COVID-19 pandemic is completely over (Rosenbaum and Russell-Bennett, 2020). For instance, on the social media channels, messages could be created based on the model of emotional contents by adopting the following scheme: (1) activate the users' attention through the creation of an anxious message; (2) raise their emotional tension and (3) suggest how the service could eliminate these emotions of fear.

Moreover, it will be fundamental to provide or rely on easy and user-friendly online ordering systems, as well as on both efficient and effective smartphone applications. In this way, it could be possible to reduce possible users' inconvenience and complaints (Schüler *et al.*, 2020). Indeed, apps characterized by a complex use could not only discourage customers from re-using them but can also lead to negative outcomes such as customers' hate toward the delivery service or the service abandonment with the consequent search for competitor ones.

Concerning attitude, it becomes fundamental to maintain a positive customers' attitude toward using OFDS over time. In order to reach this objective, restaurants managers should focus their attention on all those strategies aimed at transforming young customers into loyal ones, such as the possibility of obtaining (1) loyalty points; (2) price discounts; (3) quantity discounts; (4) group discounts; (5) friends-and-family discounts; (6) loyalty schemes.

+Furthermore, the study allows to confirm how gender represents a key factor explaining young customers' intentions in the OFDS context, thus underlying the relevance of conducting a marketing segmentation. Notably, the creation of a customer database according to gender can help restaurant firms in managing their potential customers efficiently (Hwang and Kim, 2019). In this respect, restaurants can realize specific marketing strategies respectively directed to their male and female customers, thus increasing their level of satisfaction. For instance, concerning the communication policies, results have allowed to identify the most suitable types of content to be addressed respectively to male (e.g. healthy menus, quarantine and hygiene measures, details related to the ease with which to use the delivery service) and female (e.g. healthy menus, loyalty programs, friends-and-family discounts) young customers, thus improving the overall online and offline advertising efficiency.

Managerially, the execution of all these strategies needs the recruitment and training of employees with specialized skills, which will vary if the restaurant creates its own platform or relies on third-party platforms. In the creation and management of a Restaurant-to-Consumer platform, the most important skills will be: (1) app skills: related to the creation, management and technical support of the online delivery app; (2) delivery skills: on the one hand, delivery employees should place special attention on the delivery process precision, speed and safety, especially for what concerns all the COVID-19 precautions; on the other hand, managers should ensure that these drivers follow exactly all the protocols approved by the restaurant; (3) traditional and digital marketing skills such as buyer personas' creation, social media segmentation, content marketing. Conversely, if the restaurant opts for a third-party platform, the most important skills fall within the marketing field. In particular, it will be necessary to (1) conduct an in-depth evaluation of the platforms to join; (2) realize a careful targeting analysis of the most suitable platform/s also based on the antecedents identified in the present study.

Besides the firms' perspective, this study also highlights the OFDS impact on the customers' quality of life. Considering that healthiness and hygiene represent, for customers, significant antecedents of their intention to continue using OFDS, this could mean that restaurants, by offering healthy menus with particular attention to hygiene and sanitation,

could make a considerable improvement in food style and safety for consumers. In this way, online food ordering could significantly influence the citizens' well-being. Moreover, results also underline the relevance of the ease of app use. This OFDS feature could be relevant, to the customers' quality of life, in different ways. Firstly, an easy app can reduce customers' stress by allowing them to better manage their time (Saad, 2021). Secondly, the digital payment (usually included between the app's features) enables people to avoid going out specifically to withdraw money, thus reducing city traffic. Indeed, literature (Peng, 2019) detects how online shopping, and consequently OFDS, are more traffic-friendly with respect to the offline options since they reduce the movement of people as they await delivery directly to their homes. Overall, this translates into a reduction in city traffic and a consequent improvement in air quality (Saad, 2021).

6.3 Limitations and future research

The study presents some limitations. Firstly, the sample comprises Italian university students. Therefore, it would be worthwhile to investigate if the proposed conceptual model could be applied to other target groups and geographical contexts, thus detecting possible similarities/differences in the OFDS continuance intention's antecedents in the COVID-19 context. More in detail, although the choice of adopting a sample composed of young consumers (18–29 years old) has allowed identifying habits, attitudes and purchase intentions characterizing a specific segment, thus providing valuable managerial implications, the findings are not generalizable to other population groups (e.g. more mature segments). In addition, the sample presents an imbalance for what concerns the gender distribution (34% men; 66% women). Even if this imbalance reflects the Italian situation since the majority of students enrolled in a degree course are currently women (Ministero dell'Università e della Ricerca) [2], in future research, it might be interesting to select another sample (different from Italian students) in order to possibly reduce this gap.

Secondly, the study adopts the translation–back-translation method, which could bring some potential limits, such as the difficulty in controlling the items' cultural adaptation (Iliescu, 2017).

Thirdly, the paper analyses the OFDS in general without differentiating between Restaurant-To-Consumers platforms and third-party ones. Thus, it could be interesting to compare, in future works, these different typologies of platforms.

Moreover, since the research focused its attention on the customers' continuance intention instead of effective behaviours, in the future, the conceptual model could be extended by adding other variables such as buying behaviour (e.g. compulsive buying behaviour, exploratory buying behaviour).

Furthermore, given that the paper has been created during a specific timeframe (COVID-19 pandemic), future studies can realize a longitudinal analysis to investigate customers' perceptions in different time periods (e.g. during vs after COVID-19).

Additionally, since we have specifically analysed the continuance intention's antecedents, it could be valuable to investigate in future researches its main outcomes (e.g. customers' feelings of addiction/love toward the restaurants' brands).

Finally, the OFDS adoption and continuance intention have been investigated in a particular crisis' typology (i.e. health and safety crisis). Therefore, it could be interesting to realize, in future studies, experimental analysis for examining the consumers' intention in multiple crisis situations, such as economic crises (Kumar and Shah, 2021).

Note

1. Eurostat, <https://ec.europa.eu/eurostat/web/youth>
2. <http://ustat.miur.it/dati/didattica/italia/atenei>

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Constructs	Cronbach α	Main sources
<i>Fear of COVID-19</i> I am afraid of the coronavirus It makes me uncomfortable to think about the coronavirus I am afraid of losing my life because of the coronavirus When watching news and stories about the coronavirus on social media, I become nervous or anxious	0.907	Jian <i>et al.</i> (2020), Adaptation from Rather (2021)
<i>Perceived risk of eating out during COVID-19</i> In the current situation, I prefer to avoid eating out I feel more averse to eating out due to the risk from the Covid-19 epidemic In the current situation, I prefer to shorten the duration of my potential trips outside the home		
<i>Perceived hygiene</i> The products of brand X* are hygienic The products of brand X are clean to consume Sanitation of brand X goods is well managed Brand X food is clean and hygienic to consume	0.938	Adaptation from Shim <i>et al.</i> (2021)
<i>Quarantine</i> Brand X is good at COVID 19 quarantine Brand X keeps COVID 19 quarantine well Brand X employees perform well for COVID 19 quarantine COVID 19 quarantine is well implemented at brand X		
<i>Perceived healthiness</i> The products of brand X are healthy The products of brand X improve my health condition Brand X offers health concerning products The products of brand X contain low calories	0.879	Adaptation from Shim <i>et al.</i> (2021)
<i>Attitude toward using delivery services</i> Using delivery services is useful during the current situation It is valuable to use delivery services during the current situation Using delivery services is beneficial during the current situation Using delivery services is attractive during the current situation	0.926	Adaptation from Rather (2021)
<i>Perceived ease of app use</i> It is not complex to use the brand X app Brand X provides an easy app system to use It is straightforward to use the brand X app	0.940	Adaptation from Shim <i>et al.</i> (2021)
<i>Continuance intention after COVID-19</i> I will use brand X on a regular basis in the future I will frequently use brand X in the future I strongly recommend that others use brand X	0.888	Adaptation from Li and Fang (2019)

Table A1.
Construct
Operationalization

Note(s): * Brand X stands for the OFDS brand used/experienced by the interviewed during the pandemic

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