
Factors influencing the usage of food delivery apps

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Abstract

Food delivery apps have become more relevant in recent years, with a specific increase due to Covid-19 pandemics. The research on the motivations of the users of this type of app is rather scarce, a gap that this paper seeks to contribute to. Using the theory of uses and gratifications, we developed a questionnaire-based survey and collected data online reaching a final sample of 93 respondents. The results indicate that the factors influencing the use of food delivery apps are delivery experience, customer experience and listing. Social pressure, ease of usage, quality control, convenience and restaurant search did not have any influence. No differences have been found according with gender, age, place to live, civil status, level of education or employment situation. The study has limitations related to the sampling method, by convenience, not allowing generalization to the population studied.

Keywords: Food delivery applications, influencing factors, questionnaire-based survey, sharing economy

1. INTRODUCTION

According to Cho, Bonn and Li (2019), the rapid advancements and developments in e-commerce have brought significant changes to traditional practices within the workplace, giving rise to a new model of e-commerce called "online to offline" (O2O), a platform that allows customers to purchase a wide range of products and services online or in physical stores (Kumar & Shah, 2021; Shah, Yan, & Qayyum, 2022).

Managers and markets have attempted to utilize the O2O business model to attract more online customers to their offline physical stores by providing enhanced shopping environments equipped with convenience, user-friendly design, and a wide variety of product and service options (Hubert et al., 2017, cited in Cho et al., 2019).

Food delivery apps are an example of O2O commerce and have been increasingly adopted by consumers and businesses (Li, Yao, Osman, Zainudin, & Sabri, 2022). Their usage has increased significantly in the last years, with a boom during the Covid-19 pandemics (Chotigo & Kadono, 2021; Kumar, Jain, & Hsieh, 2021). Some restaurants have changed their business models to combat the challenges posed by the pandemic and by so doing they increased the usage of food delivery apps (Francioni, Curina, Hegner, & Cioppi, 2022; Kumar et al., 2021; Li et al., 2022).

However, the motivations and the drivers influencing the intention of use of food delivery apps have been understudied (see e.g. Timur, Oguz, & Yilmaz, 2023; Williams, Tushev, Ebrahimi, & Mahmoud, 2020), different theoretical models have been used and there is still much to learn.

This research aims to contribute to the identification of the factors that motivate the usage of food delivery apps. More specifically, the research question is: *which are the factors influencing the usage of food delivery apps?*

To address this question, we develop a conceptual model based on the uses and gratification theory (UGT), adapted from Ray, Dhir, Bala and Kaur (2019). To test the model, we use a quantitative approach, using a questionnaire-based survey and we use multiple regression to identify the relevant factors.

This paper is organized as follows. In the next section, we present the theoretical grounding and develop the conceptual model. Next, we present the methodology and the results. We end with discussion and conclusions.

2. LITERATURE REVIEW

2.1. FOOD DELIVERY APPS

According to Ray et al. (2019), the growth in the field of online services has brought about changes in lifestyles and society at large. The increased use of the Internet and the growing penetration of smartphones have fuelled the popularity of various food delivery applications, such as FoodPanda, Swiggy, Zomato, and Uber Eats (Dana, Hart, McAleese, Bastable, & Pettigrew, 2021; Pigatto, Machado, Negreti, & Machado, 2017) and led to changes in consumer behaviour and business models (Kumar et al., 2021; Kumar & Shah, 2021).

The services offered by food delivery applications can be categorized as order placement, tracking, and payment; however, they are not responsible for the actual food preparation. Restaurants that provide their own food delivery services through mobile applications include Domino's, Pizza Hut, KFC, among others (Ray et al., 2019).

The continuous growth of the food delivery sector has been observed in several countries in recent years. There are various reasons that justify the popularity of online food delivery services, with convenience, social influence and customer satisfaction being the most prominent (Belanche, Flavian, & Perez-Rueda, 2020; Chakraborty, Kayal, Mehta, Nunkoo, & Rana, 2022; Cho et al., 2019; Ghouri, Tong, & Hussain, 2021; Pandey, Chawla, & Puri, 2022).

Through a mobile application, consumers have access to different types of food from a variety of restaurants, anywhere and at any time (Kapoor & Vij, 2018). Additionally, consumers save time (they don't need to cook or go out to buy food), can make choices based on other people's reviews, and compare prices ((Horta, Souza, & Mendes, 2022; Yoon, Li, & Choi, 2022).

2.2. USES AND GRATIFICATIONS THEORY

The "U&G" (Uses and Gratifications) theory is an approach used to understand why and how people actively seek specific media to satisfy specific needs) and it can be applied in a O2O setting, as previously done e.g. by Ray et al. (2019) and Shah et al. (2022).

The U&G theory can be divided into four categories: social gratifications, process gratifications, content gratifications, and technology gratifications (Ray et al., 2019). Content gratification refers to the exposure (or knowledge) that a person gains to find relevant information, process gratification refers to the pleasure obtained in a particular experience. Social gratification relates to various social influences and ties, and technology gratification refers to the gratifications anticipated from the use of different types of technologies. The eight gratifications can be classified into four dimensions: process gratification (convenience, ease of use, delivery experience, and customer experience), content gratification (restaurant search), social gratification (social pressure), and technology gratification (quality control and listing).

Customer experience, restaurant search, and ease of use are influential factors in the use of food delivery applications (Ray et al., 2019; Shah et al., 2022). However, convenience, social pressure, delivery experience, and quality control do not significantly affect the intention to use food delivery applications, with listing being the only factor that negatively influences the intention to use food delivery applications. In another recent study, Alalwan (2020, cited in Kaur et al., 2020) examined and confirmed that reviews, ratings, and prices influenced the intentions to reuse food delivery applications.

According to the results obtained from the study conducted by Lee, Lee and Jeon (2017), performance expectancy, social influence, and habit were determining factors that positively influenced the intention for continued use of food delivery applications. Additionally, these authors also found that information quality

positively influences the intention for continued use with performance expectancy as a mediating variable. Therefore, the intention to use a food delivery application depends on the perceived quality of information by the user and the performance expectancy of the application, as well as social influence and habit.

2.3. HYPOTHESES FORMULATION

Social pressure refers to the influence that friends, colleagues, family, media, and society have on an individual's actions. In the context of food delivery applications, social pressure can be identified as the advertisements presented to an individual through media, friends or family (Anbumathi, Dorai, & Palaniappan, 2023; Chotigo & Kadono, 2021; Ray et al., 2019). Based on this, the following hypothesis was proposed:

- **H1 - Social pressure is positively associated with the intention to use food delivery applications.**

Delivery experience refers to the positive experience related to food delivery when ordered through a food delivery application. Delivery experience includes locating the delivery address on a map, free delivery in some cases, and the ability to track the delivery in real time with an estimated delivery time. Previous studies suggest a positive relationship between delivery experience and usage intentions (Ray et al., 2019). A good experience leads to a positive intention to use/reuse a service. Therefore, the following hypothesis was proposed:

- **H2 - Delivery experience is positively associated with the intention to use food delivery applications.**

Customer experience refers to the various experiences a customer obtains through the use of a particular service. The customer experience of food delivery applications depends on offers, coupons, refunds, discounts, loyalty programs, and referral bonuses provided to customers. Customer experience has a significant positive association with usage intention (Ray et al., 2019). Thus, the following hypothesis was proposed:

- **H3 - Customer experience has a positive association with the intention to use food delivery applications.**

Usability in food delivery applications refers to the ease of the ordering process, the convenience of filtering food options, restaurants, and the ease of tracking the order. Over the past two decades, it has been observed that the usability of technological innovations has a significant positive association with usage intention (Pigatto et al., 2017; Ray et al., 2019). Therefore, the following hypothesis was proposed:

- **H4 - Usability is positively associated with the intention to use food delivery applications.**

Quality control refers to the standards that a service tries to maintain to remain equal or above the established standards of a particular industry. Customers expect various quality indicators in food delivery applications, such as providing photos, ratings, and reviews that allow customers to select restaurants, food items, and finalize the order (Anbumathi et al., 2023; Chotigo & Kadono, 2021; Dogra, Adil, Sadiq, Dash, & Paul, 2023; Ray et al., 2019). Recent studies suggest that a satisfied customer has a positive reason for purchasing/re-purchasing (Dogra et al., 2023). Given this, if food delivery applications provide various quality indicators to their customers, it is likely that they will have a higher probability of usage.

- **H5 - Quality control has a positive association with the intention to use food delivery applications.**

Convenience refers to the ability to use something without difficulty. Food delivery applications can provide convenience through options to compare food prices from different restaurants, allowing customers to avoid waiting times at restaurants and also avoid traffic-related situations. Previous studies on online food delivery services suggest that location, traffic, and convenience are positively associated with usage intention (Cho et al., 2019; Chotigo & Kadono, 2021; Lee, Sung, & Jeon, 2019; Ray et al., 2019). Additionally, convenience is related to the usage intention of various technologies, such as online banking and electronic government services. Therefore, the following hypothesis was proposed:

- **H6 - Convenience is positively associated with the intention to use food delivery applications.**

Usability refers to the degree to which something can be used to enhance services. In this study, usability is measured in two ways: (a) listing, which refers to the list of restaurants and food options in food delivery

applications, and (b) restaurant search. Researchers have found positive associations between usability and intention in different contexts, such as repurchase intentions in B2C e-commerce, online book, and online banking services. In the online food delivery services a positive association has been found between website content, functionality, usability, and attracting new customers (Ray et al., 2019). Thus, the following hypotheses were proposed:

- **H7 - Listing is positively associated with the intention to use food delivery applications.**
- **H8 - Restaurant search is positively associated with the intention to use food delivery applications.**

The conceptual model is presented in Figure 1 and consists of eight different antecedents (U&Gs) of food delivery application usage as independent variables. The "usage intention" of food delivery applications is the only dependent variable in this model. The empirical analysis is based on eight different hypotheses that investigate the associations of the various U&Gs.

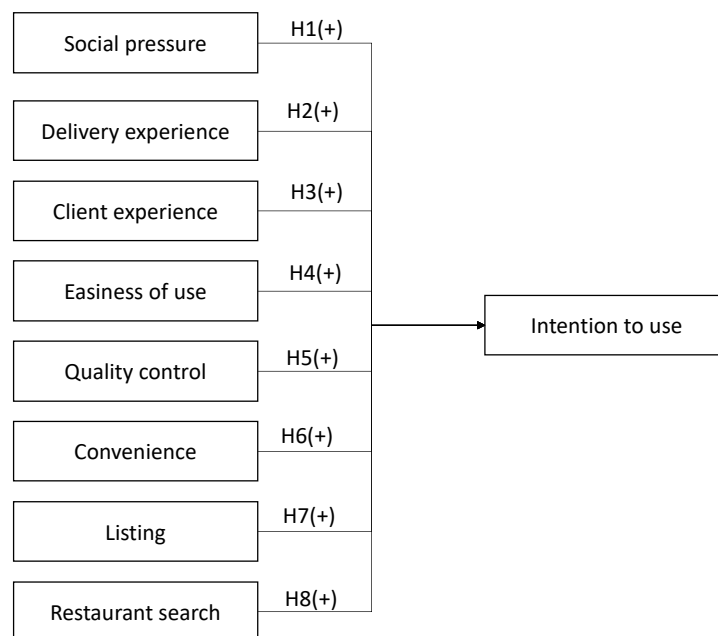


Figure 1 – Conceptual model
Source: adapted from Ray et. al (2019)

3. METHODOLOGY

To test the conceptual model, we chose a quantitative research strategy: questionnaire-based survey, following the examples of other studies (Belanche et al., 2020; Chen & Lee, 2022; Ray et al., 2019; Shah et al., 2022).

The questionnaire was developed based on the measurement scales used by Ray et al. (2019), using a 7-point Likert scale, and was developed in Portuguese. Please see appendix 1 for all the measures. Questions to collect sociodemographic elements was also included in the final questionnaire.

A pilot test was undertaken before starting the data collection. Due to convenience reasons, the survey was performed online, using email distribution and social media posts.

4. RESULTS AND FINDINGS

4.1. DATA COLLECTION

Data was collected between March 13 and April 21, 2023. After validation, a sample of 93 respondents who used food delivery apps was obtained.

4.2. RESULTS

The sample is composed of a majority of male respondents (60,22%), between 18 and 34 years old (60,21%), residents in Aveiro and Viseu (61,29%), single (62,37%), employed (60,22%) and with a higher education degree (80,65%), as seen in Table 1. Their favorite food delivery app are Uber Eats (76,34%), followed by Glovo (10,75%) and Bolt Food (6,45%).

Table 1 – Sociodemographic data

Sociodemographic data	Statistics	Sociodemographic data	Statistics	
Gender	Male: 60,22% Female: 39,78%	Academic degree	Did not finish secondary school: 2,15% Secondary school completed: 17,20% Bachelor: 41,94% Master: 34,41% PhD: 4,30%	
Age groups	18-24 years old: 39,78% 25-34 years old: 20,43% 35-44 years old: 25,05% 45-54 years old: 8,60% 55-64 years old: 12,90% 65 or more years old: 3,23%		Employment situation	Unemployed: 2,15% Student: 27,96% Working student: 5,38% Independent worker: 2,15% Dependent worker: 60,22% Retired: 2,15%
Civil status	Single: 62,37% Married / living together: 31,18% Divorced: 5,38% Widow: 1,08%			

After performing descriptive statistics on the measurement scales, we tested scale reliability with Cronbach Alpha. The Social pressure dimension was excluded (Cronbach Alpha = 0,476), the Ease of Use and Convenience dimensions were improved by eliminating one underperforming item in each dimension. The final dimensions are presented in Table 2.

Table 2 – Reliability tests: Cronbach Alpha

Dimension	Validated Items	Cronbach Alpha
Delivery experience	DE1: I like having the possibility to order food at any time of day. DE2: I like having the possibility to be able to locate the address on the map. DE3: I like having the possibility to have free delivery for specific orders. DE4: I like having the possibility to know the estimated delivery time. DE5: I like having the possibility to follow up the delivery in real time.	0,882
Client experience	CE1: I like offers e.g. coupons and discounts. CE2: I like loyalty programs launched by food delivery apps. CE3: I recommend my food delivery app to my friends so that that may win bonus and discounts. CE4: I like that ads and suggestions in the food delivery app take into account my preferences.	0,739
Ease of use	EU1: My favorite food delivery app is easy to use. EU2: Making a request in my food delivery app is easy for me.	0,813

Dimension	Validated Items	Cronbach Alpha
	EU3: I like the option to follow up the different steps of the order (order accepted, in preparation, being delivered).	
Quality control	QC1: My favorite food delivery app provides photos, evaluations and classifications that help me select the restaurants. QC2: My favorite food delivery app provides photos and critics of food items, that help me finish my order.	0,873
Convenience	CV2: Food delivery apps help me avoid traffic. CV3: Food delivery apps help me avoid waiting in the restaurants.	0,771
Listing	LT1: I like the way the geographical location of the restaurants is presented in my favorite food delivery app. LT2: I like the way the food options of each restaurants are presented in my favorite food delivery app. LT3: I like the way the menu is categorized in my favorite food delivery app.	0,862
Restaurant search	SR1: My favorite food delivery app helps me search for restaurants. SR2: My favorite food delivery app helps me discover new restaurants. SR3: My favorite food delivery app helps me discover restaurants close by.	0,862
Intention to use	IU1: In the future, I plan using my favorite food delivery app more frequently. IU2: If I have the chance, I will order food using my favorite food delivery app. IU3: I plan on continuing to order food using my favorite food delivery app.	0,892

Next, we used multiple linear regression to test the model, using the Enter method in SPSS (see Table 3).

Table 3 – Multiple Linear Regression: Model Summary, ANOVA & Coefficients

Model Summary^d

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				Durbin-Watson	
					R Square Change	F Change	df1	df2		Sig. F Change
3	,581 ^c	,338	,315	1,26904	,031	4,165	1	89	,044	1,889

c. Predictors: (Constant), LTvar, CE, DE

d. Dependent Variable: IU

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
3	73,059	3	24,353	15,122	<,001 ^d
	143,332	89	1,610		
	216,391	92			

a. Dependent Variable: IU

d. Predictors: (Constant), LTvar, CE, DE

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
3	Constant	,281	,675		,416	,679					
	LTVar	,334	,121	,284	2,752	,007	,487	,280	,237	,701	1,427
	CE	,257	,107	,238	2,404	,018	,447	,247	,207	,759	1,317
	DE	,251	,123	,209	2,041	,044	,446	,211	,176	,711	1,406

a. Dependent Variable: IU

The regression model has a weak value for the adjusted R² (0,315). However, there are three dimensions which have a significant effect on the Intention to Use (IU): Listing (LT), Client Experience (CE) and Delivery Experience (DE). The regression expression follows next:

$$IU = 0,284 * LT + 0,238 * CE + 0,209 * DE + error$$

Based on these results, we cannot reject hypotheses H2, H3 and H7. The remaining hypotheses have been rejected. The corresponding empirical model is presented in Figure 2.

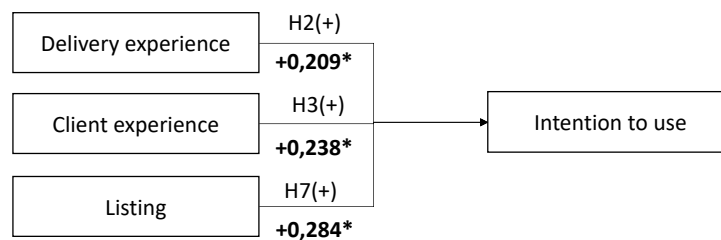


Figure 2 – Empirical model
Source: own elaboration

Finally, non-parametric tests were performed, to test whether sociodemographic variables had any impact in the dimensions of the empirical model. None of the testes variables, namely Gender, Age, Residence, Civil status, Academic qualifications or Employment situation showed any significant statistical difference between the groups.

5. DISCUSSION AND CONCLUSIONS

The study performed has limitations associated to the type of sampling. As we worked with a convenience sample, the results cannot be generalized to the population.

More, in spite of the regression model having shown that three dimensions affect the intention to use food delivery apps, the explanatory power of the model is rather low, with an adjusted R² of 0,315. This means that there could have been other variables, not taken into account in the conceptual model, that would have been needed to explain the intention to use.

The three dimensions which were found to explain intention to use food delivery apps, Delivery experience, Client experience and listing, have an important positive influence, superior to 0,20, in the intention to use. These are relevant results that, in spite of being exploratory, could be useful for the managers of restaurants and delivery apps to focus their efforts on.

Also, considering that Uber Eats was the favourite food delivery app, these results are specifically relevant for restaurants listed in this app.

As future research directions, several directions could be followed. One is performing the study using a probabilistic sampling, able to validate these results and generalize them to a specific population.

Other is including different dimensions that influence Intention to use, or even a different theory altogether, as the theory of uses and gratifications applied by Ray et. al (2019) to food delivery apps seem to explain only a limited percentage of the intention to use.

Works like Choi, Zhang, Debbarma and Lee (2021) use client satisfaction as a mediator, and that could be a dimension that could be tested to see whether it increases the explanatory value of the model.

Some works have been published on the role of brand love and brand trust on the intention to purchase in food delivery apps (e.g. Anbumathi et al., 2023; Aureliano-Silva, Spers, Lodhi, & Pattanayak, 2022) and others have studied the impact of consumption values (functional, social, emotional, conditional and epistemic) and intention to use food delivery apps (Chakraborty et al., 2022). Wen, Pookulangara and Josiam (2022) use the

theory of planned behaviour, where attitude, subjective norms, perceived behavioural control and trust were found to influence the intention to use food delivery apps.

Finally, in terms of statistical approach, an alternative would be to use structural equation modelling as done e.g. by Fakfare (2021), Zhuang, Lin, Zhang, Li and He (2021) or Wen et al. (2022).

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APPENDIX - MEASURES

Dimension	Measurement Scales	Source
Social pressure	SP1: I frequently see announcements of food delivery apps on the internet. SP2: I have seen many times my friends order food using food delivery apps.	(Ray et al., 2019)
Delivery experience	DE1: I like having the possibility to order food at any time of day. DE2: I like having the possibility to be able to locate the address on the map. DE3: I like having the possibility to have free delivery for specific orders. DE4: I like having the possibility to know the estimated delivery time. DE5: I like having the possibility to follow up the delivery in real time.	(Ray et al., 2019)
Client experience	CE1: I like offers e.g. coupons and discounts. CE2: I like loyalty programs launched by food delivery apps. CE3: I recommend my food delivery app to my friends so that that may win bonus and discounts. CE4: I like that ads and suggestions in the food delivery app take into account my preferences.	(Ray et al., 2019)
Ease of use	EU1: My favorite food delivery app is easy to use. EU2: Making a request in my food delivery app is easy for me. EU3: I like the option to follow up the different steps of the order (order accepted, in preparation, being delivered). EU4: The options to filter the different types of restaurants are useful for me.	(Ray et al., 2019)

Dimension	Measurement Scales	Source
Quality control	<p>QC1: My favorite food delivery app provides photos, evaluations and classifications that help me select the restaurants.</p> <p>QC2: My favorite food delivery app provides photos and critics of food items, that help me finish my order.</p>	(Ray et al., 2019)
Convenience	<p>CV1: My favorite food delivery app is convenient to compare prices of food in different places.</p> <p>CV2: Food delivery apps help me avoid traffic.</p> <p>CV3: Food delivery apps help me avoid waiting in the restaurants.</p>	(Ray et al., 2019)
Listing	<p>LT1: I like the way the geographical location of the restaurants is presented in my favorite food delivery app.</p> <p>LT2: I like the way the food options of each restaurants are presented in my favorite food delivery app.</p> <p>LT3: I like the way the menu is categorized in my favorite food delivery app.</p>	(Ray et al., 2019)
Restaurant search	<p>SR1: My favorite food delivery app helps me search for restaurants.</p> <p>SR2: My favorite food delivery app helps me discover new restaurants.</p> <p>SR3: My favorite food delivery app helps me discover restaurants close by.</p>	(Ray et al., 2019)
Intention to use	<p>IU1: In the future, I plan using my favorite food delivery app more frequently.</p> <p>IU2: If I have the chance, I will order food using my favorite food delivery app.</p> <p>IU3: I plan on continuing to order food using my favorite food delivery app.</p>	(Ray et al., 2019)