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Consumer opinion on online grocery shopping in Catalonia during Covid-19

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Abstract

Purpose: The aim of this research is to analyze the academic literature on online grocery shopping to identify a set of variables to assess by means of a validated survey the shopping habits of the population of Catalonia, starting from COVID-19, in a representative sample of the population in the 2020-2021 pandemic period.

Design/methodology: The methodology used for this research is qualitative and quantitative, since a validated survey is carried out with a representative sample of the population of Catalonia and subsequently, using a quantitative methodology, the answers of the questionnaire are analyzed using descriptive statistics to interpret the results and reach conclusions.

Findings: More people are planning to shop online in the future because of COVID-19 than not people who have shopped online for the first time during the pandemic. Users who have increased their online grocery shopping during the pandemic also intend to use online grocery shopping in the future. Because of COVID-19, the adoption of online grocery shopping has advanced by a few years. However, it must be taken into account that the consumer still perceives risks, such as the fact that many people want to see fresh products before buying them.

Originality/value: The most relevant contribution of this work is related to show how online food shopping is for customers and to value the shopping experience in times of pandemic. Thus, the results are intended to contribute to assess online grocery shopping and to detect the customer's perception of this type of shopping.

Keywords: Online grocery, E-grocery, COVID-19, Food, Shopping

Jel Codes: L81, L66, M10

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1. Introduction

Businesses and organizations in our society need to innovate constantly to be competitive, and grocery companies are no exception (Saskia, Mareï & Blanquart, 2016). Currently, economic activity (production, distribution, exchange and consumption) is undergoing a profound process of transformation due to the Covid-19 (Younes, Noland & Zhang, 2022) and more specifically if we focus on the purchase of online grocery (Gomes et al., 2022; East, 2022).

On the other hand, digitization and Information and Communication Technologies (ICT), have meant great changes for all organizations (Montesano, 2015) and the purchase of goods has undergone a remarkable transformation (Mortimer, e Hasan, Andrews & Martin, 2016).

The aim of this research is to analyze the academic literature on online grocery shopping to identify a set of variables to assess by means of a validated survey the shopping habits of the population of Catalonia, starting from COVID-19, in a representative sample of population in the 2020-2021 pandemic period.

The study highlights the value of omnichannel, to combine strategies in physical and online food. The study also supports the increase in online grocery shopping during the pandemic and the change experienced in online grocery shopping (Li, Verteramo Chiu, Gómez & Bills, 2021). At the same time, the study identifies the typical characteristics of online shopping in times of pandemic.

The methodology used for this research is qualitative and quantitative, since a validated survey is carried out with a representative sample of the population of Catalonia and subsequently, using a quantitative methodology, the answers of the questionnaire are analyzed using descriptive statistics to interpret the results and reach conclusions.

The results obtained in this research allow us to show how online food shopping is for customers and to value the shopping experience in times of pandemic. Thus, the results are intended to contribute to assess online grocery shopping and to detect the customer's perception of this type of shopping.

This article is made up of a total of 5 sections. The first is a conceptual framework of the topic. Secondly, the methodology used to carry out the research is explained, as well as the different hypotheses and variables used. The third section presents the results of the survey. Finally, in the last two points, the implications of the results are analyzed and conclusions are drawn.

2. Conceptual framework

E-commerce was first introduced through electronic data interchange (EDI) to value-added networks (VANs) in the 1960s (Molla & Licker, 2001). Since then, e-commerce has been evolving, first using Automated Teller Machine (ATM) to purchase products through point-of-sale terminals and credit cards, until today (Hong & Zhu, 2006; Singh & Söderlund, 2020).

It is a reality that technology has facilitated e-commerce and made it possible to make sales over the Internet and reach the whole world, with various direct and indirect businesses around it (Molla & Licker, 2001; Bauerová & Klepek, 2018). In the specific case of online food shopping, also known as e-grocery, e-commerce occurs between businesses and consumers through the commercialization of food, and this has had a great growth in the last decade, and is expected to increase in the coming years (Mortimer et al., 2016; Van Droogenbroeck & Van Hove, 2021).

As in other sectors of activity, online food retailing offers important advantages to end customers, such as time saving, access to different retailers, products and home shopping delivery (Belavina, Girotra & Kabra, 2017). Selling food online becomes in certain cases a necessity (Grunert & Ramus, 2005), because traditional food shopping involves considerable mental and physical effort, and sometimes it is not possible to make this effort for different reasons. Moreover, food shopping for many is perceived as a stressful and time-consuming task, and online shopping solves it (Geuens, Brengman & S'Jegers, 2003).

Purchase in physical store	Online shopping
Time investment	Time saving
Necessity to move around	Travel savings
Social activity	Mechanical activity
Allows to examine the product	Lack of ability to choose fresh produce
Restricted hours	Flexible schedule

Table 1. Characteristics of traditional and online shopping

If we compare online shopping with traditional food shopping, it is evident that each medium has its own characteristics that make it more or less attractive depending on the consumer profile and the specific moment of purchase (Ramus & Nielsen, 2005). The traditional supermarket allows consumers to examine the product with all five senses, to be attended by the sellers and to obtain the product immediately, but it is necessary to invest time and manage transport (Grewal, Levy & Lehmann, 2004; Otto & Chung, 2000). In the case of using the online channel, a wider range of products is available, and it is possible to buy any day of the week at any time and from any place, regardless of the location of the consumer and the retailer (Ramus & Nielsen, 2005).

On the other hand, omnichannel connects retail shoppers in traditional stores with online stores (Bodhani, 2012) and is increasing the number of food stores that are becoming multichannel retailers as they operate an online alternative alongside their traditional offline supermarkets (Müller-Lankenau, Wehmeyer & Klein 2006; Eriksson, Norrman & Kembro, 2022). Although the number of multichannel shoppers is expanding rapidly, there are still large differences in the frequency of online and traditional shopping (Melis, Campo, Breugelmans & Lamey, 2015).

An increasing number of traditional retailers are now following multichannel strategies that complement their food retail businesses with online activities (Melis et al., 2015). Multichannel food marketing strategies illustrate the diversity of retail approaches that currently exist. (Müller-Lankenau et al., 2006). Multichannel shoppers, when they start shopping online, tend to select the online store that belongs to the same chain as their offline store, especially when the online store is tightly integrated with the offline store, for variety of reasons (Melis et al., 2015).

With the COVID-19 pandemic, the prioritization of users to buy groceries over other online purchases is emphasized (Li et al., 2021). Thus, COVID-19 has boosted online food shopping (Goddard, 2021). However, in most cases, it is preferable to be physically present at the store to buy, i.e., in most cases, the majority of online grocery shopping is done online, the majority of food purchases are still made at the store because online operators do not have the capacity to offer pick-up service at the grocery store or to meet the dramatically increasing demand for home delivery of food, in many cases, and many shoppers cannot afford the cost of transportation (Li et al., 2021).

Recent data from Canada and specifically from Canadian Grocer indicates that 86% of purchases through October 2020 were physical or face-to-face and the remaining 14% were online purchases (7% were with home delivery and the other 7% were picked up in-store or at a pick-up point (Fitzgerald, 2021), so physical or face-to-face sales predominated over online sales.

It is important to keep in mind that e-commerce has the potential to increase the sustainability of food purchases compared to traditional food purchases (Heidenstrøm & Hebrok, 2022). In particular, a study highlights that online retailing could reduce the environmental impacts of shopping in certain circumstances (Van Loon, Deketele, Dewaele, McKinnon & Rutherford, 2015), as it encourages consumers to reduce trips for additional purchases and to maximize the number of items per item, among other differentials. It should be noted that online food shopping is not always more sustainable than traditional food shopping, although the future points in this direction (Srivastava & Premaram, 2019). On the other hand, an Italian study asserts that e-food shopping is potentially more sustainable than traditional shopping, with lower emissions ranging from 10% to 30%, depending on the specific context (Siragusa & Tumino, 2021).

Significant changes in the behavior of commerce, in the impact on consumers and in the implications derived from urban logistics and transport of goods, are aspects to be taken into account by those responsible for urban design and transport (Dablanc, 2019). Moreover, to motivate changes in urban logistics and goods transport systems, it is necessary to increase the involvement of municipal, regional and national authorities and governments in general, i.e., it is necessary the cooperation of public and private organizations to manage these changes (Browne, Behrends, Woxenius, Giuliano & Holguin-Veras, 2019).

3. Methodology

A validated questionnaire was sent to a representative sample of the Catalan population during the first half of 2021 to investigate the type of online grocery shopping during the pandemic. Subsequently, during the second half of 2021 and the first half of 2022, the research and elaboration of the paper was carried out.

Subsequently, this descriptive quantitative research, based on information collection and data analysis (Cavana, Delahaye & Sekaran, 2001) allows using quantitative statistics to collect the opinion of Catalan people on the purchase of online groceries during the pandemic, in line with other opinion studies, which used a questionnaire similar to the one used in this research with small modifications (Driediger & Bhatiasevi, 2019).

Regarding the development of instruments to ensure validity and allow comparison with previous studies, indicators recognized in the existing literature are used. For the first section of the questionnaire we ask the demographic and descriptive characteristics. The second part of questionnaire we ask respondents about different opinions about a topic. That is why in this case we opted for the use of the unit of measurement called Likert scale, ranging from (1) strongly disagree and (7) strongly agree (Joshi, Kale, Chandel & Pal, 2015).

Before conducting the survey, a pilot test was carried out. The pilot test was carried out with 10 people from one of the companies in the sample, who gave us feedback on the survey. The pilot test allowed us to finish modifying and correcting the possible errors and shortcomings that the article could have (Van Teijlingen & Hundley, 2002).

Regarding data collection, the research focuses on a sample of residents in Catalonia, adults, who shop at online supermarkets and traditional supermarkets, as well as at both locations at the same time. Catalonia is the third autonomous community with the highest number of homes that have access Internet with 96.7%. Only behind Melilla with 98.9% followed by Madrid, 97.1% (Statista, 2021). These data indicate that Catalonia may be more supportive of online grocery shopping than other regions of Spain.

This questionnaire was sent to 25 different companies throughout Catalonia during the years 2020-2021 according to a representative sample of the SABI database with the following filters: small and medium-sized companies, in active status, located in Catalonia and with the activity code of Clasificación Nacional de Actividades Económicas (CNAE) 5211 (Retail trade, with a predominance of food, beverages and tobacco in non-specialized establishments). The surveys were sent by e-mail to the contact e-mail address of each company, with a request to be completed by the employees. Of the total of 238 responses obtained, 211 were finally validated for analysis, after eliminating duplicates and incomplete responses. Google Forms was used to disseminate the questionnaire online, to facilitate access to the questionnaire and speed of response (Djenno, Insua & Pho, 2015).

3.1. Variables analyzed

After analyzing the different variables in the academic literature in the field, a selection was made of the variables to be included in the questionnaire and the survey was generated. All the variables have been analyzed over time, except for the variable COVID-19, for which references have been found since 2020 when the pandemic began.

The different variables analyzed, by means of the validated questionnaire and according to academic literature, are the following: SN (Subjective norm); VIS (Visibility). PR (Perceived Risk), ENJ (Perceived Enjoyment), ITU (Intention to Use), IG (In-Store Grocery), CAOG (Covid and online food shopping) and finally UB (Use Behavior).

These variables, supported by the academic literature analyzed, are mostly reflected in a recent study that collects an important part of the survey on which they have worked (Driediger & Bhatiasevi, 2019). Different variables used in the surveycan be found in the annexes.

Scale	Source
SN (Subjective norm)	(Hansen et al., 2004; Hansen, 2008; Venkatesh & Davis, 2000; Wu & Wang, 2005; Fishbein & Ajzen, 1975)
VIS (Visibility)	(Kurnia, Chien & von Westarp, 2003; Rogers, 2010; Driediger & Bhatiasevi, 2019)
PR (Perceived risk)	(Kurnia, Chien & von Westarp, 2003; Mortimer et al., 2016; Rogers, 2010; Driediger & Bhatiasevi, 2019)
ENJ (Perceived enjoyment)	(Ha & Stoel, 2009; Teo & Noyes, 2011; Yang et al., 2014; Cha, 2011; Kamis, Stern & Ladik, 2010; Alcántara, del Barrio-García & Crespo-Almendros, 2015; Davis, Bagozzi & Warshaw, 1992; Kian, Loong & Fong, 2017; Driediger & Bhatiasevi, 2019)
ITU (Intention to use)	(Kurnia, Chien & von Westarp, 2003; Hsu, Yu & Wu, 2014; Kim, Lee & Bonn, 2017; Ozkara, Ozmen & Kim, 2017; Ali, 2016)
IG (In-Store grocery)	(Mintel, 2011; Raijas 2002; Ramus & Nielsen, 2005; Degeratu et al., 2000; Picot-Coupey, Huré, Cliquet & Petr, 2009; Arce-Urriza & Cebollada, 2013; Grewal et al., 2004; Otto & Chung, 2000)
CAOG (Covid and online grocery)	(Goddard, 2021; Li et al., 2021; Ben Hassen, El Bilali & Allahyari, 2020; Janssen, Chang, Hristov, Pravst, Profeta, & Millard, 2021; Shabanpour, Shamshiripur, Rahimi & Mohammadian, 2020)
UB (Usage behavior)	(Moon & Kim, 2001; Hansen, 2008; Anesbury, Nenycz-Thiel, Dawes & Kennedy, 2016; Black, 1982)

Table 2. Variables analyzed according to academic literature

3.2. Description of the variables analyzed and hypotheses generated

1. The subjective norm (SN)

The subjective norm SN refers to the social pressure perceived by the user, according to what the user's immediate environment thinks (Fishbein & Ajzen, 1975). And, the higher the level of subjective norm, the greater the individual's behavioral intention (Taylor & Todd, 1995). Similarly, subjective norms positively influence online shopping attitudes, and their usability (Hsu et al., 2014), because social identity facilitates user engagement with groups (Huang, 2012).

First hypothesis:

H1. Subjective norm (SN) is positively related to intention to use (ITU).

2. Visibility (VIS)

Visibility (VIS) is the variable that makes the user have the knowledge of people nearby, who use or know about the online purchase of goods. The visibility (VIS) of a given technology originates from the fusion of the theory of innovation (Rogers, 2010), evident by the adopters, and the influence of visibility to adopt the technology in the long term (Karahanna, Straub & Chervany, 1999). Finally, it should be noted that visibility is an important variable that is taken into account in the technology sector (Kurnia, Chien & von Westarp, 2003).

Second hypothesis:

H2. Visibility (VIS) is positively related to intention to use (ITU).

3. Perceived risk using technology (PR)

Perceived risk (PR) of using a particular technology is another factor that arises from the spread of innovation theory (Rogers, 2010), in particular, public relations encompasses several facets, such as risk psychological, social risk, performance risk, financial risk, time risk and privacy risk. It also highlights the insecurity that an individual feels while browsing a website when they perceive a loss of privacy, inability to contact the product, and a sense of loss of time if the delivery of the product is not as expected. (Alcántara et al., 2015).

Third hypothesis:

H3. Perceived Risk (PR) is negatively related to Intended Use (ITU).

4. Perception of a good online shopping experience (ENJ)

The ENJ is perceived as a measure of an enjoyable online shopping experience (Davis et al., 1992), i.e., a measure in which the activity of using the computer to shop is perceived as a fun experience in itself, a study predicts that web-based information systems have a positive relationship between enjoyment, ease of use and perceived usefulness (Mun & Hwang, 2003). In other words, they emphasize the influence of enjoyment and the perceived attitude towards the use of technology.

Other authors endorse the importance of ENJ in online shopping, since purchase intention and perceived usefulness among consumers is demonstrated (Ha & Stoel, 2009; Teo & Noyes, 2011) and, other authors endorse the perception of enjoyment for the simple reason of shopping online (Alcántara et al., 2015; Yang et al., 2014; Cha, 2011; Kamis et al., 2010).

Fourth hypothesis:

H4. The fact of enjoyment (ENJ) is positively related to the intention to use (ITU).

5. Food shopping at the grocery store (IG)

The traditional grocery store (IG) allows consumers to examine the product with all five senses, to be attended by the sellers and to obtain the product immediately (Grewal et al., 2004; Otto & Chung, 2000). On the other hand, Internet shopping has advantages and disadvantages, such as convenience, wide range of products and prices. Disadvantages include the risk of receiving lower quality products and the loss of the more recreational aspect of sharing the face-to-face experience in physical grocery stores (Ramus & Nielsen, 2005). Other advantages are cost reduction for businesses, convenience for customers and efficiency between the two parties involved (Zhang, 2010). However, in this regard, Arce-Urriza and Cebollada in 2013 noted that the high cost of home delivery and the cost of examining the product favor the choice of the physical channel over the digital channel. Finally, another study concluded that almost three out of four people (71%) emphasize the importance of seeing, touching and judging fresh food before buying it, which is impossible to offer in an online channel (Mintel et al., 2011).

Fifth and sixth hypothesis:

H5. The purchase of food in a physical establishment (IG) is positively related to the intention to use (ITU).

H6. Food shopping in physical establishments (IG) is negatively related to COVID-19 and online grocery shopping (CAOG).

6. COVID-19 and online shopping (CAOG)

COVID-19 has been a decisive variable in the increase of online food shopping. Germany experienced a growing demand of more than double the normal level during the pandemic (Kapser, Abdelrahman & Bernecker, 2021). Online digital orders increased by 142% in December 2020 compared to December 2019. However, Canadian consumers in favor of omnichannel availability have remained loyal to buying groceries in person (Fitzgerald, 2021; Goddard, 2021). Buying groceries during the pandemic was a priority over other activities (Li et al., 2021) and at this time of pandemic has meant changes in food purchasing by consumers in different countries (Ben Hassen et al., 2020).

Seventh hypothesis:

H7. COVID-19 and online food shopping (CAOG) is positively related to intention to use (ITU).

7. Intention to use or desire to acquire a product (ITU)

The process of choosing a product or brand begins with the individual's desire to purchase it. It is followed by the search for information and the comparison with different alternatives that lead to the purchase decision process so that the individual adopts an ITU use intention. The decision-making process can be influenced by different variables, such as age, culture, family, reference groups and social class, among others. There are also individual variables (personality, experience, attitudes, motivations and lifestyle) and situational variables (purchasing power or economic situation of the individual) (Mollá, Berenguer, Gómez & Quintanilla, 2006). In short, purchase intention refers to the mental state during the decision-making process where the consumer develops the real will to act on a product or brand that originates the intention to use and the purchase action. (Hsu et al., 2014; Kim et al., 2017; Ozkara et al., 2017; Ali, 2016).

8. Usage behavior (UB)

Usage behavior refers to the continued commitment to the product, the "level of use" (Black, 1982) and is as important as the level of initial adoption. Level of use refers to the quantity of use (frequency of use) and the quality of use (variety of use). A high level of use leads to an innovative use, where a variety of different uses and new adaptations of the uses of the product are observed. This innovative use behavior (creative and adaptive use) of an existing product can extend the life cycle of the product by giving a new life to the product and stimulating and extending the speed of diffusion of the product. This variable has been widely used to measure user interaction with the purchase (Moon & Kim, 2001; Hansen, 2008; Anesbury et al., 2016).

Eighth hypothesis:

H8. Intention to use (ITU) is positively related to user behavior (UB).

Hypotheses	Variables	Relation
H1	SN ---> ITU	Positive
H2	VIS ---> ITU	Positive
H3	PR ---> ITU	Negative
H4	ENJ ---> ITU	Positive
H5	IG ---> ITU	Negative
H6	IG ---> CAOG	Negative
H7	CAOG ---> ITU	Positive
H8	ITU ---> BU	Positive

Table 3. Relation of variables in the hypotheses

A total of 8 hypotheses have been elaborated, among which there are 5 positive ones. First, there is a positive relationship between subjective norm (SN) and purchase intention (ITU). A positive hypothesis is also defined as the relationship between visibility (VIS) and purchase intention (ITU). The fact of enjoying online shopping (ENJ) and purchase intention (ITU) is also defined as a positive hypothesis. A positive relationship between COVID-19 (CAOG) affect and online food purchase intention (ITU) is proposed. The last positive relationship is between online purchase intention (ITU) and consumer use behavior (UB).

There are 3 hypotheses with negative relationships. First, between perceived risk of purchase (PR) and intention to use (ITU). The relationship between purchase in physical establishments (IG) and the intention to use online shopping (ITU) is also considered negative. Finally, the negative relationship between in-store shopping and online grocery shopping during COVID-19 (CAOG) is raised.

4. Results

After carrying out the validated survey, the results of the descriptive statistics of the sample (frequency and percentage), show values resulting from the study in Table 4.

In Table 4 we see that the most repeated frequency in age was from 26 to 45 years old. Regarding the gender of the respondents, there were 52.13% of men, 46.45% of women and 1.42% of others. There was a wide dispersion with respect to the education of the participants, but university education was the most repeated with 35.55% of the total responses. On the other hand, 55.44% were married, 29.86% were single and the remaining 14.70% were separated or widowed.

Two people (32.70%) and three people (25.79%) living in the same household were the most selected responses, followed by one person per household (16.11%) and four people (19.43%). Finally, the response of more than 4 people was the lowest with a total of only 6.16%. In the survey, 94% of the response according to employment status corresponds to employees, entrepreneurs and/or self-employed persons. Regarding annual family income, the most repeated range was between 31,000 € and 70,999 €, for 50% of those surveyed.

Characteristics of the respondent (n = 211)	Frequency	Percentage
Age		
< 18	3	1.42%
18-25	12	5.69%
26–45	89	42.18%
46–60	83	39.34%
> 60	24	11.37%
Gender		
Male	110	52.13%
Female	98	46.45%
Other	3	1.42%
Education		
Primary Education	41	19.43%
Secondary education	51	24.17%
Vocational training	44	20.85%
High School	75	35.55%
Marital status		
Single	63	29.86%
Married	117	55.45%
Divorced	27	12.80%
Widower	4	1.90%
Number of people in household		
1	34	16.11%
2	69	32.70%
3	54	25.59%
4	41	19.43%
>4	13	6.16%

Characteristics of the respondent (n = 211)	Frequency	Percentage
Job position		
Student	5	2.37%
Employee	166	78.67%
Self-employed/Businessman	21	9.95%
Unemployed	2	0.95%
Retired	5	2.37%
Other	12	5.69%
Total year income of household in EUR		
0-12,999€	2	0.95%
13,000€ – 20,999€	7	3.32%
21,000€–30,999€	26	12.32%
31,000€–49,999€	52	24.64%
50,000€–70,999€	52	24.64%
71,000€ – 100,000€	6	2.84%
>100,000€	4	1.90%
I do not wish to answer this question	62	29.38%

Table 4. Descriptive statistics of the samples

In Table 5, regarding the median, the lowest value recorded is 1 and the value of 5 is the highest value recorded. We find all the values represented at the medians, except the values of 6 and 7. Regarding the mean, the lowest value is 1.3128, for hours spent in online supermarkets each month (UB2), and the highest value is 5.1327, for examining grocery products before buying (IG2).

For the standard deviation, we obtained values between 0.7083 and 2.1165, with the lowest deviation being the hours spent buying online each month (UB2) and the highest being the increase in online purchases of food during COVID-19 (CAOG1). However, in general terms we see that the dispersion of the data with respect to the mean is around 1.7.

Finally, the variance of the variables is between 0.502 and 4.479. The lowest variance is the number of times online supermarkets are used during a month (UB1) and the highest variance is whether more online groceries were purchased during COVID-19 (CAOG1).

Construct	Item	Mean	Median	SD	Variance
SN	SN1	3.6588	4	1.5788	2.493
	SN2	3.9526	4	1.5016	2.255
VIS	VIS1	4.5592	5	1.7915	3.210
	VIS2	3.9621	4	1.6179	2.618
	VIS3	3.0806	3	1.6982	2.884
PR	PR1	3.5972	4	1.8552	3.442
	PR2	3.9384	4	1.8850	3.553
	PR3	4.0237	4	1.7524	3.071
	PR4	5.1659	4	1.7032	2.901
	PR5	4.7915	5	1.5068	2.271
ENJ	ENJ1	3.6398	4	1.7191	2.955
	ENJ2	3.3175	3	1.4272	2.037
	ENJ3	2.7773	3	1.5439	2.383
	ENJ4	3.0806	3	1.4923	2.227
	ENJ5	4.4692	5	1.4615	2.136
ITU	ITU1	3.8910	4	1.8238	3.326
	ITU2	4.0569	4	1.7692	3.130
	ITU3	4.3886	4	1.9175	3.677
	ITU4	3.5640	4	1.6241	2.638

Construct	Item	Mean	Median	SD	Variance
IG	IG1	4.3602	4	1.7683	3.127
	IG2	5.1327	5	1.6010	2.563
	IG3	3.4313	3	1.7068	2.913
	IG4	4.3128	4	1.8197	3.311
	IG5	3.3412	3	1.6027	2.569
CAOG	CAOG1	3.2417	3	2.1165	4.479
	CAOG2	3.9147	4	1.7545	3.078
UB	UB1	2.0000	2	1.2228	1.495
	UB2	1.3128	1	0.7083	0.502
	UB3	2.1659	2	1.4723	2.168

Table 5. Mean, median, standard deviation and variance

Table 6 analyzes the degree of kurtosis and skewness of the different variables. The kurtosis is a statistical measure that determines the degree of concentration of the values of a variable around the central area. Skewness is the measure that indicates the symmetry of the distribution of a variable with respect to the arithmetic mean. We find that the majority of variables show a negative skewness, a fact that is defined as a plasticity distribution. The variables with the most negative kurtosis and, therefore, with the greatest dispersion of opinions are the concern about the privacy of personal data when buying online (PR2; -1.0364), the fact of enjoying buying groceries in physical stores (CAOG1; 1.1683) and the intention to buy groceries online with free shipping (ITU3; -1.0468). The rest of the variables also show a negative kurtosis, in fact of the total of 29 variables only 4 of them show a positive kurtosis: the concern about the quality of the products delivered when ordering online groceries (PR4; 0.0373), the number of times online grocery shopping is used (UB1; 0.9060), the number of hours that online grocery shopping is used each month (UB2; 7.2074) and the frequency of online grocery shopping (UB3; 1.6590).

If we look at the asymmetry section, we can see that most variables tend to be close to 0, that is, they show a similar number of responses higher than 4 and lower than 4, since the number 4 would be the intermediate number on the likert scale. If we highlight the responses with a more negative asymmetry, we find the following variables: concern about the privacy of the information provided in online shopping. (PR2; -1.0364), the intention to use online grocery shopping if there is free shipping. (ITU3; -1.0468) and liking to buy food in physical supermarkets (CAOG1; -1.1683). On the other hand, the variables with the most positive skewness are: UB (Usage Behavior), such as UB1 (1.2305), UB2 (2.6338), UB3 (1.4274), all of them related to the frequency of online grocery shopping.

Construct	Kurtosis	Asymmetry
SN1	-0.5495	0.1884
SN2	-0.4736	0.0218
VIS1	-0.6780	-0.4613
VIS2	-0.4453	0.0279
VIS3	-0.2959	0.6209
PR1	-0.9635	0.2020
PR2	-1.0364	-0.0653
PR3	-0.7459	-0.1008
PR4	0.0373	-0.8632
PR5	-0.0729	-0.4578
ENJ1	-0.7127	0.2030
ENJ2	-0.1960	0.1998
ENJ3	-0.0232	0.7157
ENJ4	-0.2530	0.3904
ENJ5	-0.1900	-0.2990
ITU1	-0.8777	0.0917
ITU2	-0.7942	-0.0453
ITU3	-1.0468	-0.2513
ITU4	-0.6531	0.1975

Construct	Kurtosis	Asymmetry
IG1	-0.7295	-0.2725
IG2	-0.0430	-0.7108
IG3	-0.5355	0.3216
IG4	-0.8471	-0.2146
IG5	-0.6864	0.2142
CAOG1	-1.1683	0.4847
CAOG2	-0.8478	-0.0876
UB1	0.9060	1.2305
UB2	7.2074	2.6338
UB3	1.6590	1.4274

Table 6. Kurtosis and Asymmetry

Table 7 analyzes Pearson's correlation coefficient, which measures the statistical relationship between two continuous variables, ranging from -1 to +1. A value below 0 indicates that there is a negative correlation, i.e. the two variables are inversely associated. A value greater than 0 indicates that there is a positive correlation, i.e. the two variables are positively related (Benesty, Chen, Huang & Cohen, 2009).

If we look at the two variables with the lowest correlation between them, they are IG (Purchase at the physical store) and ITU (Intention to use) with -0.041 and, on the other hand, between UB (Use behavior) and IG (Purchase at the physical store) with -0.077, with the lowest correlation of all.

The variables with the most positive correlation between them are ITU (Intention to use) and UB (Use behavior) with 0.457. Also, noteworthy is the strong relationship shown by COAG (Covid and online grocery shopping) and UB (Usage behavior) with 0.419. Finally, it should be noted that the variable with the most neutral correlation, i.e. closer to 0, is between CAOG (Covid and online grocery shopping) and PR (Perceived Risk) with a value of -0.009.

	SN	VIS	PR	ENJ	ITU	CAOG	IG	UB
SN	-	-	-	-	-	-	-	-
VIS	0.347	-	-	-	-	-	-	-
PR	0.016	0.028	-	-	-	-	-	-
ENJ	0.406	0.358	-0.013	-	-	-	-	-
ITU	0.394	0.291	-0.017	0.216	-	-	-	-
CAOG	0.403	0.161	-0.009	0.361	0.369	-	-	-
IG	0.126	0.252	0.090	-0.03	-0.041	0.126	-	-
UB	0.364	0.267	-0.025	0.304	0.457	0.419	-0.077	-

Table 7. Correlations between variables

To validate the survey we used a widely accepted indicator, Cronbach's alpha statistic (Cronbach, 1951), which allows us to assess the level of reliability according to a minimum threshold. Although there is no consensus in the literature on what the minimum acceptable value should be, it is considered reliable from a value equal to or higher than 0.7 (Cronbach, 1970; Nunnally, 1978; Nunnally & Bernstein, 1994; Oviedo & Campo-Arias, 2005). Table 8 reflects a Cronbach's alpha of 0.867 and validates the research survey. On the other hand, Cronbach's alpha for standardized items is 0.872 and also validates the information used for the investigation.

Total Sample	Cronbach's alpha	Cronbach's alpha based on standardized elements
29	0.867	0.872

Table 8. Cronbach's alpha

5. Discussion

The main objective of the study is to determine the factors that influence and lead to the acceptance of online grocery shopping among Catalan consumers in times of pandemic.

The results show that out of the 8 hypotheses formulated, a total of 7 have been validated by the research. The positive relationship between subjective norm (SN) and intention to use (ITU), the positive relationship between visibility (VIS) and intention to use (ITU), the negative relationship between perceived risk (PR) and intention to use (ITU), the positive relationship between the fact of enjoying buying online (ENJ) and intention to use (ITU) have been validated, the negative relationship between purchasing in traditional establishments (IG) and intention to use (ITU), the positive relationship between COVID-19 (CAOG) and intention to use (ITU) and finally the relationship between intention to use (ITU) and user behavior (UB) has been validated. On the other hand, the only hypothesis that was not validated was the negative relationship between the purchase of food in traditional establishments (IG) and the purchase of food online during COVID-19.

Hypothesis	Relation	Validated
H1	*SN = ITU*	*Yes*
H2	*VIS = ITU*	*Yes*
H3	*PR ≠ ITU*	*Yes*
H4	*ENJ = ITU*	*Yes*
H5	*IG ≠ ITU*	*Yes*
H6	*IG ≠ CAOG*	*No*
H7	*CAOG = ITU*	*Yes*
H8	*ITU = UB*	*Yes*

Table 9. Summary of the hypothesis test

The positive relationship between ENJ and ITU (H1) is evident in this study, which means that the more a user enjoys online grocery shopping, the more likely he/she is to consolidate the intention to use online grocery shopping. The results obtained in the variable (ENJ) show that online grocery shopping is considered more interesting (ENJ5_4.47) by the respondents than fun (ENJ1_3.64). It is worth saying that a study conducted in Malaysia, (Kian et al., 2017) found a positive impact between perceived enjoyment and consumer attitude towards online grocery shopping, with a significance level of 10%. In the Thai study (Driediger & Bhatiasevi, 2019), perceived enjoyment also affected the perceived usefulness of online grocery shopping.

In this respect, the negative relationship between perceived risk (PR) and intention to use (ITU) (H2) shows that buyers who perceive more risk in online shopping have less intention to use it. In this case, it should be taken into account that the risk that most concerns the participants is the concern about the quality of the products delivered when ordering online (PR4_5,17). On the other hand, the risk that least concerns the respondents is the concern about the security of payment (PR1_3.5972), although a high percentage of people are concerned about this issue. Other studies show a positive relationship between perceived risk and perceived utility (Driediger & Bhatiasevi, 2019). In general, the surveys report a high risk associated with buying groceries online due to concerns about product quality, which demonstrates that consumers want to select fresh produce for themselves.

Regarding the negative relationship between IG and ITU (H3), the study identifies that users who like more to use traditional food shopping have less intention to buy food online. Therefore, it will be difficult to attract traditional shoppers to online shopping, as some of them see physical grocery shopping as a leisure activity. It should be noted that the majority of respondents say that they like to be able to examine the purchase in person (IG_2 5.13) and also like to make spontaneous decisions about the products in the store (IG_4.32), a fact that confirms that for most people the experience of discovering and seeing the products in the store is positive. In the results we can see that traditional in-store shopping is still for many people a social act or they simply like it and therefore do not believe that it will disappear in the short or medium term.

The negative relationship between IG and CAOG (H4) is not supported by the study, which means that users who like to shop in the traditional store have increased their online food purchases during COVID-19 or at least are planning to do so in the near future. To the answers about COVID-19 and online food shopping, there is a

variety of opinions. It is worth noting that more people are considering online shopping in the future because of COVID-19 than not people who have shopped during the pandemic.

The positive relationship between CAOG and ITU (H5) is evident in this study, which means that users who have increased their online food shopping during the pandemic also intend to use online food shopping in the future. It has also been verified that there has been many people who have bought more food during COVID-19, specifically in the same study we see that 30.3% say so, a fact that is in line with the study conducted in Qatar (Ben Hassen et al., 2020). It is worth saying that the level of education positively affects the purchase of food online (Shabanpour et al., 2020), however this variable was not decisive during COVID-19, as it had no impact on the purchase of online food in the pandemic.

The positive relationship between SN and ITU (H6) is present in this study, because a person's environment influences the online purchase of food. And, the mean value of 3.74 suggests that the majority of the sample is affected by the environment to make online grocery purchases. It should also be noted that a discrete percentage of the sample is influenced by friends and acquaintances, rather than family, for online food purchases. Studies conducted in Thailand (Driediger & Bhatiasevi, 2019) show the relationship between subjective norm and perceived customer utility.

The positive relationship between VIS and ITU (H7) occurs in this study, which means that people who know or are close to people who buy food online are also more predisposed to this purchase. Regarding the visibility VIS_1 with a value of 4.55 shows that there are more people who know people who buy groceries online than people who do not. On the other hand, we can see that the result of a study carried out showed that there is a positive relationship between visibility and attitude towards online food shopping among Australian consumers (Kurnia et al., 2003).

Finally, Hypothesis 8 (H8) is complete in this study, as the ITU is positively related to the ub of online shopping. Use intention and use behavior are highly correlated. In fact, both variables show the highest correlation between them.

If we look at the different variables, with respect to age, to analyze the results by age and only after the questionnaire is done, the respondents have been divided into 2 groups. One group of 18-45 and other with 46 or more years old. This show us that in the majority of responses the younger group is more in favor of buying food online, although there is not much difference. The perceived risk variable is where we find more differences between the 2 age groups, especially in (PR_1 and PR_2), which means that the older group is more concerned about the privacy of their information and payment. In studies carried out in Spain and Austria, increasing age was negatively associated with the purchase of online toys (Arce-Urriza & Cebollada, 2010; Naseri & Elliott, 2011). In France and Belgium, shoppers between 30 and 45 or 50 years old were more likely to buy online groceries (Goethals, Leclercq-Vandelannoitte & Tütüncü, 2012; Van Droogenbroeck & Van Hove, 2017). A recent study states that 54.4% of people between 30-39 years old currently shop online (Zatz et al., 2021).

Regarding gender, this analysis has revealed that in most variables there are no major differences, but in the variable IG (In-Store Grocery), women show more interest in examining products in physical establishments (IG_1). Other studies conducted in Australia show that women were more likely to shop online (Naseri & Elliott, 2011) and conversely, studies conducted in Spain (Arce-Urriza et al., 2010) show that men were more likely to shop online. Finally, it should be noted that gender was not a significant predictor of online shopping in France and Belgium (Van Droogenbroeck & Van Hove, 2017).

Regarding the reported monthly income, to analyze the results, the participants were divided into two groups, those with an annual household income of €0 to €49,999 and those with an annual income of more than €50,000. In general terms, it can be observed that the demographic group with less purchasing power is more in favor of buying food online, although with little difference. Households with annual household income from 0 € to 49,999 € are more concerned about the privacy of the information provided when purchasing groceries online (PR_2), and are more inclined to purchase groceries online when there is free home delivery (ITU_3). Finally, the group with lower incomes also stated that they prefer to buy groceries in physical supermarkets. (IG_1). Studies

conducted in the United States showed that 45.9% of the households that shopped online had incomes above 300% of the federal poverty line compared to 21.3% of the households that shopped only at physical grocery stores (Zatz et al., 2021). Other studies show that households with higher incomes shopped more online (Dias et al., 2020).

Regarding the marital status of the respondents, there are no significant differences between single and married people in most sections. However, in the variables (PR_1, PR_2 and PR_4) it is possible to observe a more positive result between the married group and the other groups. This means that married people feel more risk when buying online, in terms of payment security and the quality of the products delivered. The married group also shows a positive response (IG_3), because they like to meet people at the supermarket. The variable (ITU_2), on the other hand, shows a much more positive response from the singles group compared to the other groups, which means that they are more likely to buy food online when prices are competitive.

Regarding the number of people at the grocery store, we can see that there are no strong differences between the different groups. In the intention to use (ITU) we find that people who live alone show a more positive response to online shopping and parents with children show a more positive behavior to shopping in physical establishments (IG). Other studies suggest that having children at home positively affects the use of shopping services, i.e., that the increase in the number of people has a positive correlation with online shopping (Spurlock, Todd-Blick, Wong-Parodi & Walker, 2020; Wang & Zhou, 2015).

With respect to the level of education, there is no significant difference between those who have completed primary, secondary, university or vocational training. In the only section where a certain difference is shown is in perceived risk, since those surveyed with higher education show less risk with respect to the purchase of online goods than other segments of the population, other studies also agree (Hiser, Nayga & Capps, 1999; Wang, Kim, Holguín-Veras & Schmid, 2021).

6. Conclusions

The more a user enjoys online grocery shopping, the more likely he/she is to consolidate the intention to use online grocery shopping. It is also concluded that buyers who perceive more risk in online shopping have less intention to use it. Users who like more to use traditional food shopping have less intention to buy food online. It should be noted that slightly more than half of the shoppers still like to be able to examine the purchase in person and also like to make spontaneous decisions about the products in the store. It is also clear that as people who know or tend to be close to people who buy food online are also more inclined to make this purchase.

Young people are more inclined to buy food online and, on the other hand, women are more interested in examining products physically than men. Married people feel more risk when buying online, in particular with regard to the security of payment and the quality of the products delivered. Those surveyed with higher education show less risk regarding the purchase of online groceries than other segments of the population.

More people are planning to shop online in the future because of COVID-19 than not people who have shopped online for the first time during the pandemic. Users who have increased their online grocery shopping during the pandemic also intend to use online grocery shopping in the future. Because of COVID-19, the adoption of online grocery shopping has advanced by a few years.

In short, the online purchase of groceries has advanced a lot compared to previous years and is becoming more and more common in society. Everything indicates that the future lies in omnichannel, it will be important to know how to combine strategies in physical and online grocery. We foresee a future in which most people will use both types of shopping, online for convenience and physical when they want to see new products and socialize.

However, it must be taken into account that the consumer still perceives risks, such as the fact that many people want to see fresh products before buying them. These same risks should be reduced as supermarkets implement improvements and as more and more people are born online. Finally, we must continue to improve delivery

processes to make them faster, more efficient, cheaper and increasingly reduce their environmental impact to be more sustainable.

6.1. Contributions and implications

The research carried out in this work, both in the theoretical framework and in the empirical study, has allowed us to analyze the current status of online grocery, the opinion of the population of Catalonia, as well as the future challenges that are posed in the future.

One of the positive consequences of the study is to add value in future business lines of online grocery sales and to know the perceived consumer's losses and potential. It also allows to understand more deeply what are the reasons why consumers prefer to buy food in physical stores. Encouraging companies in the sector to apply strategies to make it easier and more convenient for their customers to buy groceries.

One of the most important managerial implications for companies is that consumers place a high value on the importance of shipping cost. This indicates that companies will need to create ways to make shipping cheaper or to run marketing campaigns to give the consumer the feeling that shipping is almost free, or at least that with product offers, it is already affordable for them to pay for shipping.

Another implication the study has for companies is that many people are still wary of online shopping because they still prefer to see and choose fresh food for themselves. Companies will have to find ways to build customer confidence so that they feel that the fresh food they receive at home is of the highest quality.

Additionally, it has positive implications for governments and administrations. Understanding consumer preferences will be of great importance in helping, above all, to improve the logistics of the municipality in order to help the distribution of online purchases. It is clear that logistics is one of the most important challenges of the future, and here companies and public institutions must work hand in hand to continue to optimize the delivery of the last mile. Building the cities of the future means reducing the large number of vehicles and bottlenecks, but facilitating home delivery and making it efficient and fast. Aligning administrations, online delivery companies can facilitate a more sustainable future.

In summary, the main contribution of the results obtained in this research is to contribute to improve the current situation of online grocery, especially by helping to understand more about the consumer's opinion, and thus to know what are the aspects they prefer about online grocery shopping and traditional shopping, in order to improve multichannel shopping in the future.

6.2. Limitations and future research

The limitations of the study are the sample and time. Firstly, the study attempted to collect a global picture of the acceptance of online shopping in Catalonia. It is also uncertain whether the sample surveyed in Catalonia really represents the entire online shopping population in Catalonia.A total of 211 valid responses were obtained. To ensure a minimum level of representativeness and manageable error, the number of responses is low. This should be taken into account as a limitation of the study.

Although we have tried to distribute the questionnaire throughout the territory, it should be taken into account that it is likely that the perception of consumers may be changing in different areas. We are also aware that it was not possible to reach more age groups, as most of the participants are of working age and retired people have not been taken into account. It would be very positive in the future to be able to carry out other similar studies, including other age groups, as well as other parts of Spain in order to be able to compare the results.

Finally, it is important to highlight the time limitation, since the survey was carried out in a specific period and it has not been possible to follow it up during different years, it would be interesting to be able to capture how the opinion of the population evolves in the future in order to check if the adoption of this type of purchase continues to increase, as expected.

The importance of being able to monitor the same topic in different geographical areas is highlighted, in order to assess whether there are significant differences depending on the consumer's country. On the other hand, it would be interesting to be able to focus future research on purchase delivery, focusing on understanding the preferred delivery methods, in order to optimize last-mile delivery, one of the most important challenges.

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Annex. Validated survey model used

1. General Information								
Are you a Catalan citizen?	Yes	No						
Age	< 18	18–25	26–45	46–60	> 60			
Gender	Male	Female	Other					
Education	Primary Education	Secondary education	Vocational training	High School				
Marital status	Single	Married	Widower	Divorced				
Number of people in household	1	2	3	4	>4			
Total year income of household in EUR	0-12,999	13,000 – 20,999	21,000– 30,999€	31,000– 49,999	50,000– 70,999	71,000 – 100,000	>100,000	I prefer not to answer this question
Job position	Student	Employee	Self-employed/Businessman	Unemployed	Retired	Other		

In the following sections each number will represent the following answer: (1 = Strongly disagree), (2 = Strongly disagree), (3 = Somewhat disagree), (4 = Neither agree nor disagree), (5 = Somewhat agree) (6 = Basically agree), (7)= Strongly agree).

2. Subjective Norm (SN)								
SN1	Members of my family think that it is a good idea to buy groceries via the Internet.	1	2	3	4	5	6	7
SN2	Most of my friends think that shopping groceries via the Internet is a good idea.	1	2	3	4	5	6	7

3. Visibility (VIS)								
VIS1	I know people who buy groceries online.	1	2	3	4	5	6	7
VIS1	Where I work or study there are people who buy groceries online.	1	2	3	4	5	6	7
VIS3	For me it is common to see and / or be with other users who buy groceries online.	1	2	3	4	5	6	7

4. Perceived Risk (PR)								
PR1	I am concerned with the payment security aspects of Online Grocery Shopping.	1	2	3	4	5	6	7
PR2	I am concerned with the privacy of my information provided when using Online Grocery Shopping.	1	2	3	4	5	6	7
PR3	I am concerned with the punctuality of the delivery time of Online Grocery Shopping.	1	2	3	4	5	6	7
PR4	I am concerned with the quality of the products delivered when ordering from Online Grocery Shopping.	1	2	3	4	5	6	7
PR5	I distrust the security of Internet banking in Spain.	1	2	3	4	5	6	7

5. Enjoyment (ENJ)								
ENJ1	Online Grocery Shopping is fun.	1	2	3	4	5	6	7
ENJ2	Online Grocery Shopping makes me feel good.	1	2	3	4	5	6	7
ENJ3	Online Grocery Shopping is enjoyable.	1	2	3	4	5	6	7
ENJ4	Online Grocery Shopping is not uncomfortable.	1	2	3	4	5	6	7
ENJ5	Online Grocery Shopping is interesting.	1	2	3	4	5	6	7

6. Intention to use (ITU)								
ITU1	I intend to use Online Grocery Shopping when the service becomeswidely available.	1	2	3	4	5	6	7
ITU2	I intend to use Online Grocery Shopping when the price is competitive.	1	2	3	4	5	6	7
ITU3	I intend to use Online Grocery Shopping when there is free homedelivery.	1	2	3	4	5	6	7
ITU4	Whenever possible, I intend to use Online Grocery Shopping to purchase groceries.	1	2	3	4	5	6	7

7. In-Store Grocery (IG)								
IG1	I like to buy groceries in physical supermarkets	1	2	3	4	5	6	7
IG2	I like to be able to examine groceries before buying	1	2	3	4	5	6	7
IG3	I like meeting other people in the supermarket	1	2	3	4	5	6	7
IG4	I like to make spontaneous decisions in the store about the products I buy	1	2	3	4	5	6	7
IG5	I see physical grocery shopping as a leisure activity	1	2	3	4	5	6	7

8. Covid and Online Grocery (CAOG)								
CAOG1	During the Covid-19 I bought more groceries online	1	2	3	4	5	6	7
CAOG2	Due to the Covid-19 I plan in the future to make more grocery purchases online	1	2	3	4	5	6	7

9. Usage behavior (UB)							
How many times do you use online supermarkets during a month?	Never	Less than once a month	Approximately once a month	2 times a month	3-4 times a month	Approximately once a week	Several times a week
How many hours do you use online supermarkets each month?	<1h	1-5h	5-10h	10-15h	15-20h	20-25h	>25h
How often do you use online supermarkets?	Never	Very infrequent	Infrequent	Usually	Often	Quite frequent	Very frequent