Influence of the Covid-19 Pandemic on Purchasing Behavior and the Perception of Shipping Price and Delivery Time by Brazilian E-shoppers

Igor Luiz de Almeida Sousa, Kivia Mota Nascimento, and Roberta Alves

Abstract The covid-19 pandemic accelerated many digital transformations in Brazil and the world, and one of them was online shopping, which already had an upward trend in revenue and grew even more from 2020 onwards due to the social isolation actions as a way as how to contain the spread of coronavirus. This above-expected increase directly impacted the value and time delivery of online purchases. It is relevant, in this moment of advanced vaccination and return of presidential economic activities, to study whether the dynamics of online shopping tend to remain constant. To characterize the online purchase behavior of Brazilian consumers throughout the pandemic and their intentions of online shopping in the post-pandemic future, as well as their perceptions about the shipping prices and delivery time, questionnaires, were applied to e-shoppers from Brazil. Information was collected regarding the profile of the sample, the isolation situation in the face of the pandemic, the online purchase behavior during the period, and their perceptions about the freight changes. The results indicate that part of the changes in online shopping that occurred during the period of the covid-19 pandemic should remain in the post-pandemic scenario. They also indicate that there is a perception that the shipping prices has increased and that the delivery time has decreased during this period.

Keywords E-commerce purchase behavior · Covid-19 pandemic · Changes in freight

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1 Introduction

The Covid-19 pandemic, decreed by the World Health Organization (WHO) in March 2020, affected purchasing relationships, due to the social isolation necessary to contain the contagion of the virus [1]. To favor social distancing actions, several companies considered "non-essential", such as bars, stores, and gyms, were forced to keep their doors closed and, in the face of this scenario, entrepreneurs had to adapt quickly to keep their businesses competitive [2–4].

With the need to maintain their operations, physical stores began to see the digital market as an opportunity [5]. In line with this, consumers' shopping needs substantially changed purchasing patterns and influenced a higher-than-expected increase in e-commerce sales [6]. In Brazil, in 2020, there was a 68% growth in e-commerce sales, totaling more than 300 million online purchases and a record value of US$ 43.6 billion [7]. In addition, it is estimated that 20 million Brazilians made their first online purchase in 2020 and 150,000 stores began to sell their products online during this period [7].

The advance in vaccination, with more than 70% of the population fully vaccinated [8], and the consequent reduction in the number of deaths caused by Covid-19, allowed sectors of the economy to resume their face-to-face activities. Despite the growth in the economic activities, the recovery was uneven across sectors, and traditional retail in December 2021 was still 2.3% below the pre-pandemic level, with an emphasis on the book, newspaper, magazine, and office segment, which was in a sales level of 34.4% lower than in February 2020 [9].

In this sense, it is necessary to study what changes that occurred in the dynamics of online shopping during the pandemic tend to remain in a post-pandemic scenario, and which should return to patterns closer to those observed in the pre-pandemic period. Thus, this research aims to characterize the change in purchasing behavior in Brazilian e-commerce and consumer perceptions regarding shipping prices and delivery time during the pandemic.

2 Research Method

The present research has an applied nature characterized by its practical interest and qualitative-quantitative approach [10]. This research is classified as exploratory since there is not much accumulated and systematized knowledge about the topic to be addressed [11]. This research fits into the survey technique regarding the methodological procedures since the data will be collected from a sample taken from a certain population that we wanted to know.

A survey must be performed according to the following steps [12]:

1. Specification of objectives
2. Operationalization of concepts and variables
3. Development of the data collection instrument

4. Instrument pre-test
5. Sample selection, data collection, and verification
6. Analysis and interpretation of data
7. Presentation of results

Thus, based on the objective established for this study, which is to characterize the change in purchasing behavior in Brazilian e-commerce and e-shoppers' perceptions regarding deadlines and shipping prices during the pandemic, the main information collected refers to the profile of the respondents, the situation of isolation in the face of the Covid-19 pandemic, the behavior of online shopping during the period and the perceptions about the change in the regarding shipping prices and delivery time of online shopping. Then, the concepts and variables to be measured were defined, such as demographic data, information on isolation, the frequency of purchases, types of products purchased, etc. From there, the data collection instrument was elaborated containing 27 questions to collect all the necessary information. A pre-test was carried out with the researchers involved to check if there were any errors. After validation, the online questionnaire was used as an instrument to collect data and information from participating e-shoppers. A total of 388 responses were sent via e-mail between August and November 2021. E-shoppers from all regions of Brazil responded to the questionnaire, most of them residing in the Southeast region. The collected data were analyzed and interpreted in Microsoft Office Excel® and RStudio® software, to prepare the report.

3 Results and Discussion

3.1 Personal Attributes

Table 1 shows the characterization of the sample that responded to the survey.

The total number of respondents to this survey is 388 people, 60% women and 39% men. Most of the sample, 65.5%, is concentrated in the Southeast Region of Brazil, 18.6% resides in the South Region, and the other 16% is divided between the Northeast, North, and Center-West regions. Regarding marital status, 42.2% of the sample is married, 38.7% are single and 20.1% are divorced, widowed, or in a stable relationship. As for age, 2/3 of the sample is between 18 and 45 years old and 1/3 is 46 years old or older. The predominant schooling in the sample is complete postgraduate education, which corresponds to 76.3% of respondents, while the other 23.4% have completed high school or higher education.

Most respondents, 68.8%, are public sector employees and in terms of income, 68.6% of the sample have an average monthly family income between 5 and 20 minimum wages. Regarding the situation of social isolation, 54.1% of respondents said they were only going out a few times and only 13.1% said they were not in isolation. Regarding the work situation, 64.4% said they were working from home,

Table 1 Statistical characteristics of the sample

Variable	Category	Frequency	Relative frequency
Gender	Female	233	60.10%
	Male	153	39.40%
	Other	1	0.30%
	Rather not answer	1	0.30%
Region of Brazil	Southeast	254	65.50%
	South	72	18.60%
	Northeast	38	9.80%
	North	18	4.60%
	Midwest	6	1.50%
Marital status	Married	160	41.20%
	Single	150	38.70%
	Divorced	30	7.70%
	Widower	3	0.80%
	Stable Union	45	11.60%
Age	18–25 years	51	13.10%
	26–35 years	94	24.20%
	36–45 years	112	28.90%
	46–55 years	79	20.40%
	Over 55 years	52	13.40%
Education	Complete high school	47	12.10%
	Complete higher education	45	11.60%
	Complete postgraduate	296	76.30%
Household income (in Brazilian minimum wage[a])	Up to 4	87	22.40%
	5–10	123	31.70%
	11–20	143	36.90%
	Above 20	35	9.00%
Primary activity	Public employee	267	68.80%
	Private sector employee	20	5.20%
	Student	66	17.00%
	Freelancer	10	2.60%
	Unemployed	11	2.80%
	Retired	3	0.80%
	Businessperson	3	0.80%
	Others	8	2.10%
Social isolation situation	Go out sometimes	210	54.12%
	Be in isolation	103	26.55%
	Not be in isolation	51	13.14%
	Just go out for work	24	6.19%

(continued)

Table 1 (continued)

Variable	Category	Frequency	Relative frequency
Work situation	Is working from home-office	250	64.43%
	Not working	53	13.66%
	Is working in person in a sector not considered "essential"	49	12.63%
	Is working in person in a sector considered "essential"	36	9.28%

[a]Brazilian monthly minimum wage in 2021: BRL 1100.00; US$ 213.17 [13]

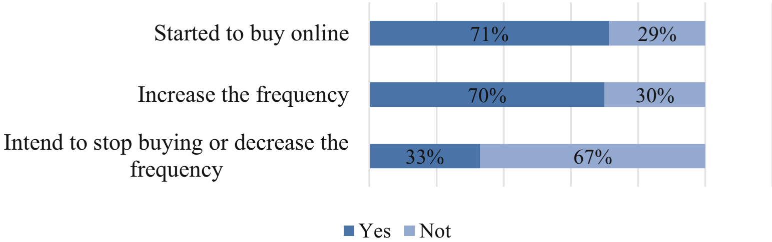

Fig. 1 Distribution of respondents who changed their purchasing behavior

12.6% said they were working in person in a sector considered non-essential and 9.3% worked in person in a sector considered essential.

3.2 *Change in Purchasing Behavior*

Regarding online shopping behavior, respondents were asked if there was any category of products that were not purchased online and started to be purchased through this means after the beginning of the pandemic and if there was any category that they already bought through e-commerce, but who started to buy more often that way. In addition, they were asked if they intend to stop using e-commerce to buy a category of products after the end of the pandemic. The distribution of responses is shown in Fig. 1.

When asked if there was any category that was not purchased online before the covid-19 pandemic, and started to be purchased online, 71.2% of the sample answered in the affirmative. A similar case occurred when the question was whether there was any category that was already purchased through e-commerce before the start of the health crisis, but which from the beginning of the pandemic began to be purchased online more frequently, in what 70.1% of respondents said yes.

When asked if there was any category that the respondent bought online during the pandemic but intended to stop buying or to buy less frequently online, only 33% of the sample answered yes, while 67% answered that they did not intend to

Table 2 Distribution of e-commerce behavior changes by category

Category	Increased the frequency	Started to buy online	Intend to stop buying or decrease the frequency
Ready-to-eat food and drinks	122	8	36
Food Products	84	55	29
Books and Magazines	77	38	14
Supermarket shopping	76	112	53
Health/Cosmetics/Perfumery Items	63	100	18
Clothing	62	100	36
Housewares	47	73	11
Computer Items	40	56	7
Home Appliances	40	55	11
Electronics	39	41	8
House and Decoration	36	57	7
Stationery and Office	29	35	10
Pet Products	25	39	8
Sports and Entertainment	24	41	5
Toys	18	27	5
Baby Items	8	14	3
Construction	7	14	1
Telephony	4	8	1
Others	2	1	0

stop buying or decrease the frequency of online shopping. This may indicate that the increase in the use of e-commerce as a means of purchase during the pandemic tends to continue, even after the end of the restrictions imposed during this period.

The distribution of the categories of products that respondents started to buy or increased the frequency of online purchases, and those that intend to stop buying or decrease their frequency in e-commerce, is shown in Table 2, which is classified in descending order by the column "Increased the frequency".

It is possible to observe that, when it comes to the increase in purchase frequency, the most cited category is the ready-to-eat food and drinks, which is one of the least cited categories in the item started to buy after the beginning of the pandemic. This can be explained by the fact that the delivery business was already widespread before the pandemic, but it became the only way to buy ready-to-eat food and drinks during trade restrictions in the most acute stages of contagion. Among the 130 people who answered that they increased their purchase frequency or started to buy in this category, only 36 (27.7%) intend to stop buying or reduce the frequency of purchase of ready-to-eat foods and drinks.

The food products and books and magazines segments complete the top 3 of the most cited when asked about the increase in online shopping frequency, with 84 and 77 responses respectively. The category of books and magazines was also mentioned by 38 respondents, who said they started to buy these products online after the beginning of the pandemic, but only 14 people said they intend to stop buying or reduce the frequency of online purchases. In line with this, we have the book, newspaper, magazine, and office segments, which were the retail segment that in December 2021 was furthest from the pre-pandemic level, 34.4% below [9]. This may point to a trend that the increase in online purchases in this category should continue and even cause a possible reduction in sales in the physical market.

Among the categories that respondents started to buy online after the beginning of the health crisis, supermarket shopping was the most cited, with 112 responses. This was also one of the most cited categories when it came to increasing online shopping frequency. With 53 responses, the supermarket shopping category is also the most cited among those in which respondents intend to stop buying or reduce the frequency of purchases on the internet, but even so, it represents only 28.2% of those who have increased the frequency or started to buy this category online during the pandemic.

The categories of items for health/cosmetics/perfumery and clothing are in second place among the most cited by respondents who started to buy a category of products on the internet, with 100 responses each. These two categories were also cited similarly about the segments that respondents claim to have increased their online shopping frequency, with 63 for the category of items for health/cosmetics/perfumery and 62 responses for the clothing category. However, only 18 people responded that they intend to stop shopping or reduce the frequency of online purchases in the first category, compared to 36 in the second.

3.3 *Change in Shipping Perception*

It was asked if the sample noticed any change in the shipping prices during the pandemic and the answers were stratified by region of Brazil (see Figs. 2 and 3).

In this sense, 37.1% noticed an increase in the shipping prices, 10.3% noticed that the value decreased, 33.5% did not perceive any change in the value and 19.1% did not know how to respond. When we segment the sample by region, this scenario remains, with the proportions remaining similar in all regions of the

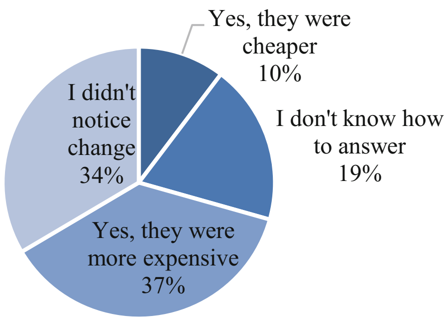

Fig. 2 Distribution of responses about change in the shipping prices

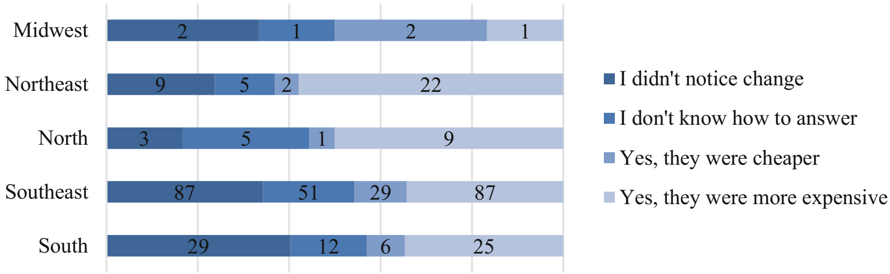

Fig. 3 Distribution of responses about change in the shipping prices by region

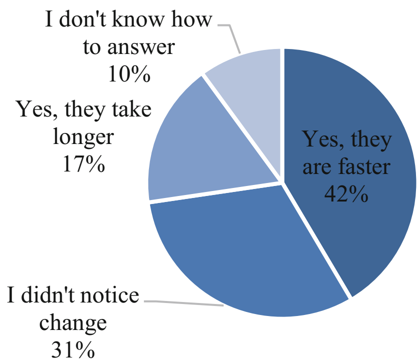

Fig. 4 Distribution of responses about changes in the delivery time

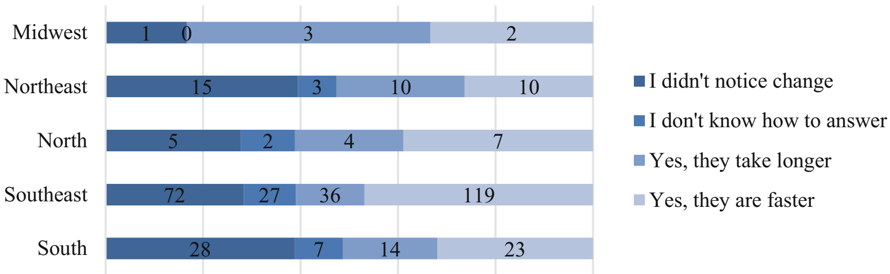

Fig. 5 Distribution of responses about changes in the delivery time by region

country, showing that this increase in value was similarly perceived throughout Brazil. However, a survey carried out by the Promo-bit shows that the shipping prices for the same product costs up to 10 times more in the Northeast region than in the Southeast region [14].

Respondents were also asked if they noticed any changes in the delivery time for purchases made through e-commerce during the pandemic and the answers were stratified by Brazilian regions (see Figs. 4 and 5).

Regarding the delivery time of purchases made through e-commerce, 41.5% of respondents noticed that deliveries are arriving faster, 17.3% of those deliveries are taking longer, 31.2% did not notice any change and 10.1% could not answer. This difference was even more pronounced in the Southeast region, where 47.0% of respondents noticed that delivery time are faster. In the Northeast region, perceptions are more divided, 26.3% realized that deliveries are faster, the same percentage realized that deliveries are taking longer, and 39.5% did not perceive any change in values. In fact, the delivery time for the Northeast region can be up to twice as long when compared to the delivery time for the Southeast region [14].

4 Conclusion

Based on the answers obtained, it is possible to assume that the purchasing behavior in e-commerce underwent significant changes during the pandemic and that, apparently, many of these changes that occurred in this period should remain after the end of the health crisis, and the e-commerce should gain more in lives of Brazilians.

The scenario for the management of shipping these orders is difficult, as with the increase in demand, shipping prices also seems to have increased. On the other hand, the general perception is that during the pandemic the delivery time for e-commerce was faster in Brazil, which indicates that the sector apparently has improved during the crisis. In order for e-commerce to continue growing in Brazil, it is necessary to think of solutions that increase the efficiency of urban logistics systems, reducing costs and, at the same time, further reducing the delivery time.

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