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Electronic Commerce during the Social Isolation Period: Impacts of COVID-19

Comércio eletrônico durante o período de isolamento social: impactos do COVID-19

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Abstract: The purpose of this paper is to analyze the impacts of the COVID-19 pandemic on e-commerce usage behavior. With the closure of face-to-face retail, compatibility and ease of use became essential factors in building consumer trust in online commerce, but not as important as the social pressure. The study was conducted online, exclusively among Brazilian consumers. Data were collected using self-administered questionnaires, based on the technology adoption literature, and analysed using SEM. Results indicate a weakening of the effects of utilitarian constructs on purchase

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intention. In contrast, the effects of social aspects on the formation of purchase intention strengthened during the pandemic, revealing aspects of online consumer intention during pandemics. The paper's originality stems from the addition of compatibility and anxiety constructs in the context of online purchasing, which are crucial during a period of technology adoption due to social pressures.

Keywords: e-commerce; technology adoption; compatibility; anxiety; COVID-19.

Resumo: O objetivo do presente artigo é analisar os impactos da pandemia de COVID-19 no comportamento de uso do comércio eletrônico. Com o fechamento do varejo presencial, a compatibilidade e a facilidade de uso tornaram-se fatores importantes na construção da confiança do consumidor no comércio online, mas não tão importantes quanto a pressão social. O estudo foi realizado online, exclusivamente entre consumidores brasileiros. Os dados foram coletados por meio de questionários autoaplicáveis, baseados na literatura de adoção de tecnologia, e analisados por meio de SEM. Os resultados mostram evidências de um enfraquecimento da influência dos aspectos utilitários, bem como um fortalecimento dos aspectos sociais na formação da intenção de compra durante a pandemia e revelam aspectos da intenção do consumidor online durante pandemias. A originalidade deste artigo decorre dos construtos adicionais - compatibilidade e ansiedade em fazer compras online, cruciais em um período de adoção de tecnologia devido a pressões sociais.

Palavras-chave: comércio eletrônico; adoção de tecnologia; compatibilidade; ansiedade; COVID-19.

Introduction

The SARS-COV-2 virus pandemic (Schwartz and Graham, 2020), responsible for COVID-19, broke out at the end of 2019, when the first occurrences of virus contamination were reported. Given that the main form of contagion of the respiratory virus occurs through close contact with the infected person, whether through coughing, sneezing and droplets of saliva or a runny nose (Cruz *et al.*, 2020), and that its contagion capacity is very high, measures of distancing and social isolation were necessary to contain its spread. This fact, in turn, changed people's routine, contributing to changes in society's behaviors and habits, especially with regard to hygiene measures, the use of masks and related to consumption (and even communication) mediated by technology, given the impossibility of face-to-face purchases during the quarantine period (Coutinho, 2020).

Faced with this scenario, consumers were compelled to adjust their shopping routines, resulting in an increase in electronic commerce transactions (Mendonça, 2016), particularly during the quarantine period. Isolation also boosted the search for new products that were not previously purchased through e-commerce (Riveira *et al.*, 2020). According to the Brazilian Association for Electronic Commerce (ABComm, 2023), prior to the pandemic, online retail accounted for approximately 4.85% of total retail sales in Brazil. By 2020, this share surged due to lockdowns and social distancing, with online sales share reaching 8.08% of total retail (abcomm, 2025).

The COVID-19 pandemic dramatically altered the landscape of e-commerce, introducing uncertainty, emotional stress, and forced adoption behaviors that challenge the assumptions of classical technology adoption models such as TAM (Davis, 1989), UTAUT (Venkatesh *et al.*, 2003), and DOI (Rogers, 2003). While these models emphasize rational evaluation—via constructs such as perceived usefulness, ease of use, and compatibility with home routines—pandemic conditions elevated other, more emotional, dimensions, including anxiety and social norms (Aguillar *et al.*, 2023; Religia *et al.*, 2023). This shift raises questions about the explanatory sufficiency of established models in extraordinary circumstances. Thus, there is a clear gap in understanding how emotional and social disruptions reshape e-commerce adoption behaviors.

In this sense, this paper aims to identify how social isolation has affected consumer behavior within e-commerce, as well as highlighting consumers' perceptions of issues related to the adoption of online shopping. Although constructs like perceived usefulness and ease of use remain important, the pandemic has reconfigured their relative influence. High levels of uncertainty and social restrictions

have amplified the relevance of emotional and contextual variables—such as anxiety and social norms—which are often underrepresented in classical frameworks.

Thus, the proposed model preserved the classical antecedents of the intention to use e-commerce from the theories of acceptance and use of technology, such as: (1) perceived ease of use; (2) perceived usefulness; (3) perceived compatibility; (4) social influence or norms; (5) and trust in the use of e-commerce systems. In addition, to reflect the emotional state generated by the pandemic context, the anxiety construct was included in the model.

Given that the pandemic led to an increase in e-commerce use, the results of this research may be helpful for companies seeking to evaluate their actions during social isolation, as the digital transformation of companies has accelerated during this period (Salman *et al.*, 2020).

Although several studies have applied TAM and related models in global contexts, fewer have evaluated their explanatory power under crisis conditions in Latin America. This study contributes to international literature by testing emotional and social constructs—such as anxiety and social norms—in a health crisis. Within the Brazilian context, it provides empirical evidence on how forced digitization reshapes consumer behavior, complementing local studies (Aguillar *et al.*, 2023) that highlight infrastructural and cultural particularities.

The context of the pandemic and its impact on consumption

The SARS-CoV-2 outbreak has caused significant damage to the global economy, resulting in a sharp decline in GDP across all continents, in addition to triggering a global health crisis (Coutinho, 2020). To contain the damage caused by the Coronavirus, a practice called lockdown has been implemented worldwide, which involves restricting people's movement, prohibiting travel and store openings, and maintaining only essential activities (Scheifer, 2020).

From this isolation practice, behavioral changes occurred in individuals worldwide, particularly affecting consumer practices, such as the use of digital technologies (Coutinho, 2020; Scheifer, 2020). E-commerce has grown at an exponential rate during the lockdown period. Before the COVID-19 pandemic, a forecast predicted that global retail would increase by 4.4%, reaching US$26.5 trillion in 2020, with an 18.4% growth forecast for electronic commerce (E-marketer, 2020). Following the establishment of the pandemic, new estimates from the E-marketer (2020) have reduced global retail e-commerce sales forecasts to a growth rate of 16.5% in 2020 (down from 20.2% in 2019).

However, after the lockdown situation was imposed around the world and in Brazil (as of March 2020, by several governors and city halls), and during the period when social distancing measures were adopted, online shopping began to grow in considerable proportions. It overturned the existing forecasts regarding the growth rates of e-commerce, as new and existing online consumers sought to obtain products by the available means (Barnes, 2020), namely, e-commerce. This context resulted in changes in the population's consumption habits.

An example of these changes was noted in the delivery of meals. During isolation, the feeling of security and well-being at home caused a huge increase in delivery orders with the use of Uber Eats, Rappi and iFood applications (Riveira *et al.*, 2020), pointing to a growth trend of delivery of this type of product - food and ready meals (Chang and Meyerhoefer, 2020).

E-commerce shopping promoted consumers' time-saving shopping habits and facilitated their search for the best offers – both in terms of price and product selection (Kumar *et al.*, 2020). Additionally, with social isolation, the population began to have more flexible hours to surf the internet due to an increase in home-office hours (Social Miner, 2020), which led to the behavior of visiting e-commerce sites earlier and more frequently.

During that time, ACI Worldwide (2020) reported that global e-commerce sales grew by 209% in April 2020 alone. While small and medium businesses digitized their operations, large established online retailers prospered (Barnes, 2020). However, failures occurred either due to a shortage of certain products from Asia (Hasanat *et al.*, 2020) or the excessive charging of hygiene items, such as masks and alcohol gel (Barnes, 2020).

If on the one hand, purchasing via e-commerce provides consumers with access to detailed product information, promoting interaction with other consumers, the exchange and sharing of ideas, on the other hand, it limits the interaction and sensory experience of touching, feeling, experiencing and testing products, which can generate frustrations (Mariano *et al.*, 2018).

In this sense, in a post-pandemic, socially detached world, it is assumed that, with changing consumer habits, technology will continue to play an increasingly significant role in the way purchases are made (Barnes, 2020). Thus, it remains to be seen whether consumers will prefer digital over physical in the future. Early lessons from China suggest that the pandemic accelerated e-commerce trends after the blockade (Stewart, 2020), which corroborates with Riveira *et al.* (2020), who reported a 25% to 45% increase in new e-commerce buyers. The authors also suggest that consumers should

adopt hybrid sales and omni-channel after the pandemic is over, encompassing both e-commerce and brick-and-mortar purchases in their routines.

Theoretical Framework

The rapid acceleration of e-commerce during the COVID-19 pandemic necessitated a reassessment of traditional technology adoption frameworks. While TAM (Davis, 1989), UTAUT (Venkatesh *et al.*, 2003), and DOI (Rogers *et al.*, 2005) have long been employed to explain consumer behavior, they typically emphasize utilitarian motivations such as perceived usefulness and ease of use. However, the pandemic introduced non-volitional adoption contexts, wherein social norms, anxiety, and perceived compatibility gained prominence. Prior studies have not adequately captured these psychological and contextual dynamics in emerging markets, such as Brazil. This study proposes a refined framework incorporating both classical and crisis-sensitive constructs, arguing that trust alone is insufficient in explaining behavior under duress. The model emphasizes emotional and social pressures, providing a more comprehensive lens for understanding technology adoption during forced digital transitions.

Thus, the model presented in this study was based on Davis *et al.* (1989), in the UTAUT model by Venkatesh *et al.* (2003), and the Theory of Diffusion of Innovation (Rogers *et al.*, 2005) and specifically e-commerce, and its more utilitarian constructs related to the perceptions and intentions of individuals for their adoption. Additionally, relationships between the anxiety construct and online shopping are proposed (Compeau *et al.*, 1999; Çelik, 2011, 2016), particularly in the context of social isolation and the non-volitional adoption of online shopping during the pandemic.

Perceived ease of use (PEoU), perceived usefulness (PU), and their relationship with trust (TR)

The Technology Acceptance Model (TAM) by Davis *et al.* (1989) is widely applied in studies of technological adoption and models that investigate information systems. Its parsimony and proof in different contexts (Venkatesh and Davis, 2000) make it widely used in e-commerce literature (for example, Lim and Ting, 2012; Basarir-Ozel and Mardikyan, 2017; Idris *et al.*, 2017).

According to TAM (Davis *et al.*, 1989), the two basic foundations of technological adoption are the perceived ease of use (PEoU) and the perceived usefulness (PU). Therefore, individuals who believe that using a given system would be effort-free and who perceive usefulness in performing tasks through a system were more likely to adopt it. PU and PEoU are key antecedents of behavioral

intention (BI) to adopt technologies, which could be used to evaluate online shopping (Gefen and Straub, 2000; Devaraj *et al.*, 2002; O'Cass and Fenech, 2003; Kim and Chang, 2007; Faqih, 2013; Ceribeli *et al.*, 2015).

Additionally, in the online domain, consumer trust (TR) is a complex concept that manifests in various ways (Kim and Peterson, 2017). It is defined by Corritore, *et al.* (2003) as a positive attitude towards situations of online risk management, in which it is believed that someone's vulnerabilities will not be exploited. In general, online channels are more vulnerable to security threats and fraud, with the lack of online trust being one of the main reasons for consumers not considering a purchase through e-commerce (see, for example, Van Slyke *et al.*, 2006; Pavlou *et al.*, 2007; Benbasat *et al.*, 2008). Additionally, several studies have provided empirical evidence that trust factors substantially and positively impact behavior (Faqih, 2011; Hsieh and Liao, 2011; Abu-Shamaa *et al.*, 2016). Trust is crucial for customer–provider relationships, and their reputations influence it (see Milan, Ribeiro, de Toni, and Larentis, 2010). Therefore, based on these arguments, the following hypotheses are proposed:

H1: The perceived usefulness of online shopping systems, during the pandemic, generates consumer trust in adopting these systems.

H2: The perceived ease of use of online shopping systems, during the pandemic, generates consumer trust in adopting these systems.

H3: There is a direct and positive relationship between perceived ease of use and the perceived usefulness in online shopping systems, during the pandemic.

Trust (TR) and the online shopping intention.

Regarding online trust, Kim and Peterson (2017) conducted a meta-analysis to understand its role in e-commerce contexts, identifying 16 recurring relationships between online trust and other constructs across 150 empirical studies. Their study revealed that online trust has significant background effects such as perceived privacy, perceived quality of service and has effects on interest-dependent variables, such as loyalty, purchase intention and repeated purchase intention.

Additional analysis by Kim and Peterson (2017) also indicated that methodological characteristics, such as study design, type of website, and types of items used to measure trust-building, moderated certain online trust relationships.

In this sense, authors such as Oliveira *et al.* (2017) tested the dimensions of consumer trust in its three main dimensions: (1) competence; (2) integrity; and (3) benevolence, suggesting that consumers with high levels of trust show a greater intention to buy online. In addition, trust in online shopping can suffer cultural influences (Hallikainen and Laukkanen, 2018), with national culture explaining 23% of the variation in the consumer's general willingness to trust, and the willingness to trust is a highly significant indicator of perceived reliability of an online store.

Furthermore, the interactivity of websites can compensate for reduced consumer control over the e-commerce environment (Wu, 2019). Given that online shopping promotes greater agility and interactivity between customers and consumers (Martins *et al.*, 2010), the most important factors for customer satisfaction when making a virtual purchase are the delivery deadline and the quality of the product, as well as the if the products have a relatively lower price as compared to the ones bought elsewhere (e.g. physical stores). Moreover, the perceived benefits of online consumption, whether hedonic, emotional, or utilitarian, are compared to those of purchases made in physical stores (Islam and Daud, 2011; Sarkar, 2011). These arguments support the proposal of the following hypothesis:

H4: There is a direct and positive relationship between online trust and consumer behavioral intention to adopt online shopping systems.

Perceived compatibility (PC) and its relation to ease (PEoU), perceived usefulness (PU) and trust (TR)

The Theory of the Diffusion of Innovations (TDI) is one of the most used theories to investigate the adoption of technological innovations (Gibbs and Kraemer, 2004; Pease and Rowe, 2005) and attests that potential consumers make decisions to adopt or reject a given innovation based on their beliefs, or even in the compatibility of innovation with their belief system (Agarwal and Karahanna, 2000).

In a way, the incompatibility between innovation and individual needs can generate negative perceptions and uncertainty regarding the adoption and use of a particular innovation. The TDI describes five attributes of innovations that influence an individual's perception in their decision to adopt or reject an innovation: (1) relative advantage; (2) compatibility; (3) complexity; (4) testability; and (5) observability (Rogers *et al.*, 2005). However, in the literature, the relative advantage and perceived usefulness are often treated as similar. Complexity, on the other hand, is associated with the opposite of the perception of ease of use (Moore and Benbasat, 1991).

Perceived compatibility (PC), according to the definition posited by Rogers *et al.* (2005), is the degree of consistency with a given individual's social and cultural values, that is, the degree to which an innovation is perceived as consistent with the existing values, previous experiences and needs of potential adopters (Rogers, 1995), being positively related to any decision to adopt innovation.

The empirical study by Hernández-García *et al.* (2010) highlighted that perceived compatibility was the most significant variable influencing the behavioral adoption of online shopping in Spain, a finding corroborated by previous research in the e-commerce context (see Crespo and Del Bosque, 2010; Wu and Wang, 2005). Perceived compatibility also generates trust for online transactions, as in hotel booking contexts (Ozturk *et al.*, 2016). Other studies have shown that perceived compatibility can also have moderating effects on the use of online systems (Islam, 2016). Therefore, compatibility has a direct effect on online trust; therefore, the next hypothesis of the model is proposed:

H5: There is a direct and positive relationship between perceived compatibility and trust online.

In the Brazilian context of the pandemic, it is hoped that the perceived compatibility will help to foster a favorable perception of e-commerce users regarding its adoption, mainly due to its effects on the perceived ease of use and usefulness. Individuals who perceive the compatibility of use with their beliefs of trust in the systems (be it shopping, mobile apps or others) also end up having a better perception about the ease of using them (Cheng, 2015; Ozturk *et al.*, 2016) and its usefulness (Moqbel *et al.*, 2014; Cheng, 2015; Mehra *et al.*, 2021). Thus, the following hypotheses are proposed:

H6: There is a direct and positive relationship between the perceived compatibility and the perceived ease of use of online purchasing systems.

H7: There is a direct and positive relationship between the perceived compatibility and the perceived usefulness of online purchasing systems.

Social influence (SI) and social norms (SN)

Deutsch and Gerard (1955) described two psychological needs that lead individuals to conform to the expectations of others: (1) informational social influence, or the need to be right and (2) normative social influence, or the need to be accepted. Informational influence (or social proof), or simply social influence (SI), was defined by Venkatesh *et al.* (2003) as the influence to accept

information from others as evidence about reality. This influence is extremely useful when there is uncertainty or ambiguity in stimuli.

A social norm is an expectation about the appropriate behavior that occurs in a group context. Sherif and Sherif (1953) point to social norms as formed in group situations and, subsequently, serving as standards for the individual's perception and judgment when he or she is not in group situations. The dimension was initially proposed by the theory of planned behavior (Fishbein and Ajzen, 1977) as a relevant factor for the adoption of innovations.

Empirical studies conducted in various social contexts and across diverse application domains have consistently demonstrated that social influence affects intentional behaviors (Venkatesh and Bala, 2008; Andrews and Bianchi, 2013; Zhu and Chen, 2016). In impulse purchases, the literature points to social influences (or social norms) as being a relevant factor to press members of a society to carry out online purchases (Hu *et al.*, 2019; Moqbel *et al.*, 2014). Social norms also have a positive influence on compatibility (Sitorus *et al.*, 2019). Thus, given the results of these studies, the following hypotheses are suggested:

H8: There is a direct and positive relationship between social norms and the consumer's behavioral intention to adopt online shopping systems.

H9: There is a direct and positive relationship between social norms and consumer compatibility for adopting online shopping systems.

Anxiety

Affection and anxiety represent the affective responses of individuals to the use of computers. Affection represents the positive side - the pleasure a person gets from using computers - while anxiety represents the negative side - the feelings of apprehension or anxiety that we experience when using computers. According to the original theory by Compeau *et al.* (1999), the greater an individual's anxiety about the computer, the less it will be used.

The pandemic brought to Brazilians a picture of emotional and psychic changes that exacerbate sadness, depression, nervousness, and anxiety and sleep problems in individuals (Barros *et al.*, 2020), which could affect their usage of digital purchase systems. Concerning e-commerce itself, anxiety, in general, stems from the customer's concerns about the failure to obtain the desired purchase results due to operational obstacles (for example, navigation problems, checkout procedures or poorly

designed interface) or the implications of online shopping, such as identity theft, credit card fraud, privacy violations, unauthorized access to accounts, or deceptive promotions (Çelik, 2011). Despite considerable advances in the security and infrastructure of electronic commerce, some online stores lack interface improvements, more responsive navigation tools, convenient checkout processes, privacy policy and clearer data usage (Çelik, 2016). In view of the above, it is expected that anxiety will negatively affect the consumer's behavioral intention to adopt online shopping systems. Thus, the last hypothesis of the model is proposed (see figure 1):

H10: There is a direct and negative relationship between anxiety and the consumer's behavioral intention to adopt online shopping systems.

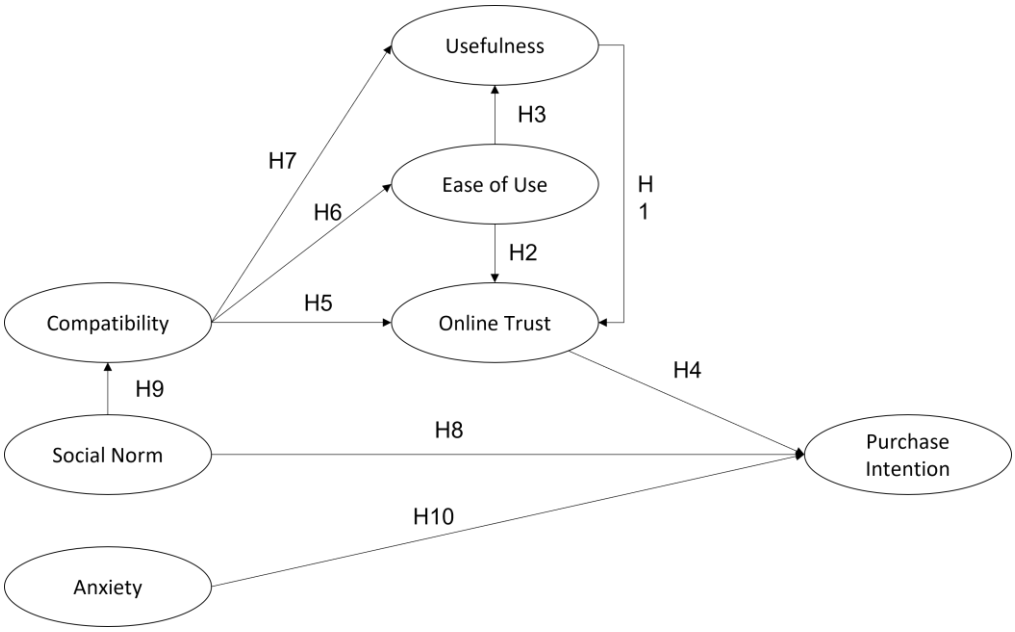

Figure 1.
Proposed Model
Source: own elaboration

Methodology

The present study employed a cross-sectional survey design, utilizing self-administered online questionnaires (Malhotra *et al.*, 2010). The research instrument included an introductory presentation text in the header, ensuring that all respondents had a consistent understanding of the vocabulary used in the questionnaire. A non-probabilistic convenience sampling method was used.

The number of valid responses reached a total (n) of 310. The valid responses were then analyzed using AMOS CB-SEM.

Operationalization of Variables

The research instrument was developed using adaptations of previously validated scales from existing studies. Perceived ease of use, adapted from Nysveen *et al.* (2005); perceived usefulness, adapted from Davis (1989); perceived compatibility, adapted from Rogers *et al.* (2005); trust in the use of e-commerce systems, adapted from Koufaris and Hampton-Sosa (2004) and Pavlou (2003); social norms, adapted from Wu and Wang (2005) and Venkatesh and Davis (2000); anxiety, adapted from Compeau *et al.* (1999); behavioral intention/purchase intention, adapted from Davis (1989). All items used a 5-point Likert-like scale (1 = Strongly Disagree, 5 = Strongly Agree). The constructs, their items, sources, loadings and reliability can be found in Table 1.

Two pre-tests were conducted to ensure the clarity of the final research instrument and to enable respondents to easily identify the questions within a friendly layout and simple navigation, suitable for both desktops and mobile devices. Both tests involved small numbers of the desired population. The first pre-test focused on item clarity; some items were reworded for better comprehension. The second test focused on online delivery and visual layout. Minor interface adjustments were made to improve response rates and data quality. The final product of this preparatory stage was an online questionnaire hosted on the Qualtrics platform, consisting of 38 items, including three behavioral filtering items, five demographic items, and 30 items referring to the constructs present in the proposed model.

Sample and Data Collection Procedures

The target population of this work was formed by Brazilian individuals, most of whom lived in the metropolitan area of Rio de Janeiro, who had at least one online shopping experience during the period of social isolation, due to the COVID-19 pandemic.

A non-probabilistic convenience sampling method was used, combining snowball (Morgan, 2008) and volunteer sampling (Jupp, 2006). Recruitment was conducted through a university mailing list (≈approximately 10,000 students) and social media networks (Facebook, LinkedIn, and WhatsApp). Inclusion criteria included being over 18 and having made at least one online purchase in the prior six months. All prospects received an invitation to participate in the research, accompanied

by a link to answer the questionnaire. Data collection started on September 15, 2020, and extended until January 15, 2021.

The sample was primarily composed of residents of the metropolitan area of Rio de Janeiro, with a predominance of women (66.3%) and individuals attending university or with a university degree (95.8%). Of a total of 310 participants who completed the entire questionnaire, 105 were male (33.6%) and 205 were female (66.3%). The average age of the respondents was 33.6 years, with a good dispersion between 20 and 50 years. Regarding the generational profile, the sample included 180 individuals (58%) Millennials and Generation Z and 130 individuals (42%) from older generations. Regarding education, 117 individuals (37.9%) were attending university, and 180 individuals (57.9%) already held a college degree and/or a complete postgraduate degree.

When asked about shopping habits, 69% (or 214 individuals) said they had bought more frequently during the pandemic, especially in the following categories: meals, food and drinks by delivery (61.6%), electronics (57.1%), fashion and accessories (50.3%), household appliances (44.2%), home and decoration (40.3%), health/cosmetics/perfumery (37.1%), supermarkets groceries (28.4%), sport and leisure (24.6%).

A priori sample sufficiency was tested using G*Power 3.1 software. For a medium effect size ($f^2 = 0.15$), an alpha level of 0.05, and power (1-β) of 0.80, the minimum sample required for a model with eight predictors was 109 participants. The study's actual sample of 310 respondents exceeds this requirement, ensuring statistical power and robustness for Structural Equation Modeling (Cohen, 1988; Faul *et al.*, 2009).

Analysis of Results

Measurement Model

The analysis of the measurement model relied on a confirmatory factor analysis to test the validity, unidimensionality and reliability of the applied scales (Hair et al, 2011). The model was tested and presented good adjustment indexes with a significant value for the chi-square index ($\chi^2 = 553.454$, d.f. = 322, $p < 0.001$, χ^2 / d.f. = 1.719); in addition to the other indexes being within the recommended by the literature: CFI of 0.950; 0.951 IFI; 0.942 TLI; 0.048 RMSEA (Hu and Bentler, 1999; Malhotra *et al.*, 2010).

Face validity was established by selecting scales that have been previously used in the literature. The nomological validity test was conducted by evaluating the correlation matrix between

constructs, with the significance and directions of the correlations aligning with the theory's expectations. Convergent validity was verified by observing the average variance extracted (AVE) values, which were above 0.5 for each construct. The test of internal consistency and reliability of the constructs presented indexes greater than 0.7 for composite reliability. Finally, the discriminant validity was also achieved, with maximum shared variance (MSV) lower than AVE and the squared root of the construct's AVE greater than its correlation with other constructs. With all the validities established satisfactorily, it was possible to proceed to the hypothesis testing stage. Table 2 shows the discriminant validity matrix.

Structural Model

The research hypotheses were tested using structural equation modeling (SEM). This method demands a good conceptualization, delimiting well the constructs before implementing the tests (see Martins and Pelissaro, 2005). In the proposed structural model, the chi-square statistic had a significant value (χ^2 = 772.226, d.f. = 335, p <0.001, χ^2/d.f. = 2.305). The indices that assess the incremental adjustment of this model were satisfactory at the indicated levels of 0.9 (Malhotra, Birks, and Wills, 2010): CFI of 0.906; 0.900 TLI; IFI of 0.907. In turn, among the absolute indices, the RMSEA of 0.065 was acceptable, being less than the 0.08 suggested by Hu and Bentler (1999). Together, the analysis of the adjustment indices of the structural model indicates an adequate adjustment of the data to the proposed model.

With the indices obtained by the structural model, the suggested hypotheses were tested. Therefore, the hypotheses were analyzed as to the direction, magnitude and significance of the estimated coefficients (Byrne, 2010). The results show that nine out of 10 research hypotheses were accepted. The standardized coefficients estimated for each model construct and their loadings are shown in Table 1.

Table 1.
Constructs, items, factor loadings, and composite reliability.

Construct	Items	Loadings	CR
Usefulness (Davis, 1989)	During the pandemic, Internet shopping increases my ability to make good purchasing decisions. During the pandemic, internet shopping allows me to make my purchases faster. During the pandemic, internet shopping allows me to increase the effectiveness of my purchases. During the pandemic, when I shop online, my shopping performance improves.	0.716 0.702 0.871 0.753	0.834
Ease of use	During the pandemic, it's easy to make an Internet shopping service do what I want.	0.702 0.780	0.763

(Nysveen *et al.*, 2005)	During the pandemic, my interaction with Internet shopping services is clear and understandable. During the pandemic it is easy to shop online.	0.705	
Online trust (Koufaris and Hampton-Sosa, 2004; Pavlou, 2003)	During the pandemic I feel safe in my internet purchase transactions. During the pandemic I trust the Internet shopping site to keep my personal information safe. During the pandemic I believe that the Internet shopping site administrators will not misuse my personal information. During the pandemic I believe in the information that internet shopping sites provide. During the pandemic there are no negative results in Internet shopping. Based on my perception of internet shopping during the pandemic, I know they are not opportunistic.	0.687 0.863 0.840 0.700 0.703 0.703	0.927
Compatibility (Rogers *et al.*, 2005)	During the pandemic, shopping online fits in well with my lifestyle. During the pandemic, making purchases over the Internet fits the work style well. During the pandemic, shopping over the Internet fits my shopping needs well.	0.835 0.803 0.701	0.816
Social Norms (Wu and Wang, 2005; Venkatesh and Davis, 2000)	During the pandemic people who are important to me would think I should use internet shopping. During the pandemic people who influence me would think that I should use Internet shopping. During the pandemic, people whose opinions are important to me would prefer that I use Internet shopping. During the pandemic, people in my organization who use internet shopping play an important role.	0.783 0.872 0.892 0.682	0.873
Anxiety (Compeau *et al.*, 1999)	During the pandemic I feel apprehensive about using Internet shopping. During the pandemic I hesitate to use solutions over the Internet, for fear of errors that I will not be able to correct. During the pandemic Internet solutions are somewhat intimidating for me.	0.782 0.728 0.663	0.768
Purchase Intention* (Davis, 1989)	During the pandemic I intend to buy online. During the pandemic I predict that I will buy online. During the pandemic I plan to buy online. During the pandemic I will strongly recommend others to buy online. If I have access to the Internet, I will possibly want to buy during the pandemic.	0.816 0.900 0.914 0.706 0.690	0.893

Source: own elaboration

* purchase intention is equivalent to the behavioral intention to adopt online shopping.

Table 2.

Correlation and discriminant validity matrix

Construct Name	AVE	MSV	1	2	3	4	5	6	7
1. Purchase Intention	0.628	0.305	**0.792**	0.552	0.408	0.344	-0.443	0.377	0.490
2. Compatibility	0.598	0.425	0.305	**0.773**	0.494	0.422	-0.409	0.648	0.652
3. Social Norms	0.636	0.244	0.166	0.244	**0.798**	0.237	-0.142	0.383	0.360
4. Trust	0.698	0.394	0.118	0.178	0.056	**0.836**	-0.470	0.287	0.480
5. Anxiety	0.527	0.228	0.196	0.167	0.020	0.221	**0.726**	-0.088	-0.477
6. Usefulness	0.560	0.442	0.142	0.420	0.147	0.082	0.008	**0.748**	0.665
7. Ease of Use	0.519	0.442	0.240	0.425	0.129	0.230	0.227	0.442	**0.720**

Note. Correlations are above the main diagonal. Squared multiple correlations are below. Main diagonal is AVE squared root. All correlations are significant at a level of 0.05 or below.
Source: own elaboration

Figure 2 displays the results and loadings for each hypothesis. Nine out of ten hypotheses were confirmed, according to their p-values (* for p-value<0.05 or ** for p-value<0.001).

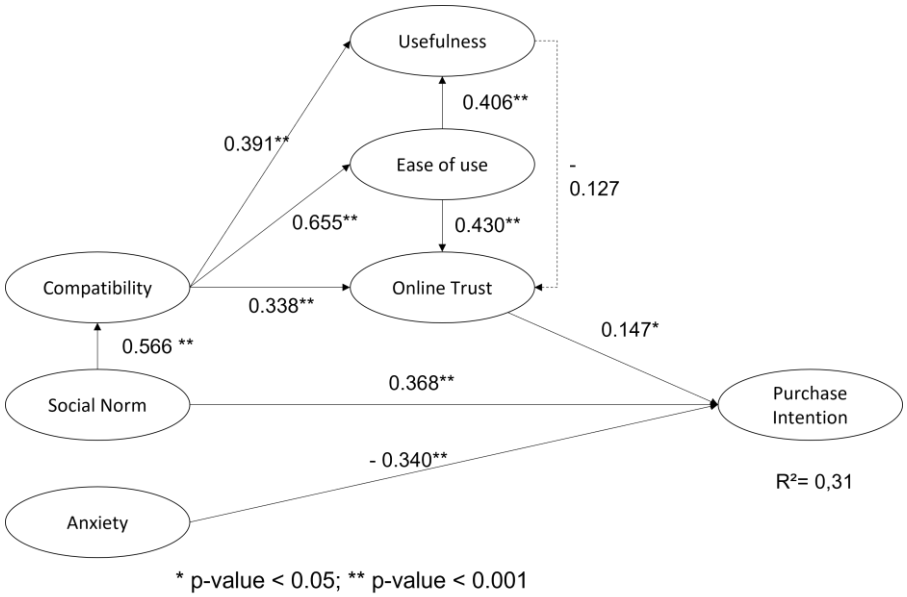

Figure 2.
Results
Source: own elaboration

On table 3, the hypotheses are displayed with their standardized coefficients and the status (either supported or not).

Table 3.

Hypotheses, standardized coefficients, and Status (supported or not).

Hypotheses	Coefficient	P-value	Supported
H1: Perceived usefulness -> online trust	-0.127	0.187	No
H2: Perceived ease of use -> online trust	0.430	< 0.001	Yes
H3: Perceived ease of use -> Perceived usefulness	0.406	< 0.001	Yes
H4: Online trust -> Purchase intention	0.147	0.015	Yes
H5: Perceived compatibility -> online trust	0.338	< 0.001	Yes
H6: Perceived compatibility -> Perceived ease of use	0.655	< 0.001	Yes
H7: Perceived compatibility -> Perceived usefulness	0.391	< 0.001	Yes
H8: Social norms -> Purchase intention	0.368	< 0.001	Yes
H9: Social norms -> Perceived compatibility	0.566	< 0.001	Yes
H10: Anxiety -> Purchase intention	-0.340	< 0.001	Yes

Source: own elaboration

Discussion

Recalling that the objective of the present research was to identify the effects of social isolation and the pandemic on the antecedents of the behavioral intention of adopting online shopping, several significant results were found, with the confirmation of nine of the 10 hypotheses proposed for the current research.

Data were collected using self-administered questionnaires and analyzed using structural equations. From the relationships foreseen by the models of technology adoption and the Theories of Diffusion of Innovations, significant effects of the relationships between perceived ease of use and online trust, as well with usefulness. Relationships between online trust, social norms and anxiety were confirmed to be significant with purchase intention. In

addition, perceived compatibility had a significant effect on online trust, perceived ease of use and usefulness. Social norms also had significant effects on perceived compatibility.

The proposed model supports the mediation of usefulness, perceived ease and compatibility by trust, which makes sense when we are forced to do something we do not want, but we have access to reliable channels to perform that task (in this case, buying from online retailers). Choosing how to buy due to usefulness or ease of use is no longer important given the degree of trust placed in the seller (in the case of the study, virtual stores or e-commerce operators).

The results obtained explained about 31% of the variation ($R^2 = 0.306$) found in the intention to buy online during the period of the epidemic. This result is considered substantial by the social sciences literature in general, but weak for marketing research (Hair et. al., 2011), making it clear that there are other important factors that influence the formation of online shopping intentions during the pandemic and that were not considered in the model.

The results reinforce aspects raised in the literature, that social norms have a direct and positive influence on online purchase intention (Hu *et al.*, 2019; Moqbel *et al.*, 2014) and that social norms influence direct and positive compatibility (Sitorus *et al.*, 2019).

Perceived compatibility also had significant effects, which corroborated with the literature on the perception of usefulness (Moqbel *et al.*, 2014; Cheng, 2015; Mehra *et al.*, 2021) and perceived ease of use (Cheng, 2015; Ozturk *et al.*, 2016). Social norms had a direct and positive influence on online purchase intention (Hu *et al.*, 2019; Moqbel *et al.*, 2014), as well as a positive influence on compatibility, in line with the literature (Sitorus *et al.*, 2019). And, finally, anxiety had a direct and negative influence on online purchase intention, also in line with the literature (Çelik, 2011, 2016).

In addition, the results point to a low influence of the utilitarian aspects on trust and from it on the intention to buy, which contradicts the conventional literature on the subject, but which constitutes a central point in this work. Moreover, social norms had a considerable direct and positive influence on online shopping intention (0.368). Also, it was evidenced a considerable influence of anxiety on the online shopping intention (-0.340), particularly when compared with the effects of trust (0.147), which measured usefulness effects on online shopping intention. This indicates that the usefulness component was barely present in the intention to buy

online during the pandemic period, suggesting that people were shopping online due to strong social pressure to stay home and away from the streets.

These findings align with recent studies on pandemic-era digital behaviors, which suggest that emotional responses such as anxiety and perceived social pressure often override rational cost–benefit evaluations (Aguillar *et al.*, 2023; Religia *et al.*, 2023; Halim, 2022; Rosa *et al.*, 2022; Faizah and Prakoso, 2021). In particular, the strong influence of social norms on behavioral intention during lockdown reflects broader shifts in consumer reliance on peer behavior and social media cues (Krisdiyawati *et al.*, 2022; Rosa *et al.*, 2022; Atika and Suryanto, 2022). Unlike pre-pandemic adoption models, where trust and perceived usefulness were dominant, this study shows that anxiety can directly motivate adoption as a coping mechanism. Therefore, the model expands existing literature by highlighting a context in which classical predictors remain relevant but are recontextualized and reprioritized.

Final considerations

The present study unveils relevant aspects of e-commerce, highlighting important antecedents and mechanisms of the intention to buy online during the period of social isolation. Its originality lies in the fact that it proposes additional constructs to the classical technology acceptance models, such as TAM by Davis *et al.* (1989) and UTAUT (Venkatesh *et al.*, 2003). Thus, the compatibility construct from the diffusion of innovations (Rogers *et al.*, 2005) and the anxiety in making online purchases (Çelik, 2011, 2016) were added to the model. The results indicate a weakening of the influence of utilitarian aspects, while simultaneously showing a strengthening of social aspects in the formation of purchase intention during the pandemic. Issues such as compatibility and ease of use, while important factors in building consumer trust in online commerce during this period, were less significant than social pressure in forming the intention to buy online.

The findings underscore the significance of addressing the emotional and social aspects of the user experience. For example, reducing cognitive overload and increasing transparency can mitigate anxiety and improve trust. E-commerce platforms should also emphasize social validation mechanisms—such as reviews, ratings, and endorsements—during crises, as social norms strongly influence purchasing decisions in such contexts.

This study argues that traditional models may fail to explain consumer behavior during periods of crisis adequately. Although constructs like perceived usefulness and ease of use remain

important, the pandemic has reconfigured their relative influence. High levels of uncertainty and social restrictions have amplified the relevance of emotional and contextual variables—such as anxiety and social norms—which are often underrepresented in classical frameworks. The sustained support for nine of the ten hypotheses in this study suggests continuity. Yet, the relative strength of effects, particularly those associated with anxiety and trust, indicates underlying behavioral changes. Therefore, this research does not merely reaffirm classical theory but rather reveals its evolving nature in response to societal disruptions.

Limitations and Future Research

Given that the sample was recruited by convenience due to the difficulty of access imposed by the lockdown restrictions, and that the questionnaires were self-administered, these facts are understood as limitations. This study is limited to a cross-sectional analysis during the pandemic's peak in Brazil and may not capture post-lockdown behavioral stabilization. Cultural and regional factors in Brazil may also limit the generalizability of the findings.

As possibilities of future work, researchers could carry out multi-group analyses that point to possible generational, income or place of residence moderations, on relationships that point to the purchase intention. This aligns with the literature that suggests possible effects of sociodemographic variables (Hashim *et al.*, 2009) on electronic retail. Future research should explore the longitudinal effects of health crises on e-commerce adoption, especially regarding evolving compatibility and anxiety levels. Comparative studies across cultural contexts could further validate the model's robustness. Another suggestion is the incorporation of new constructs, particularly those related to social and emotional aspects, which should enhance the explanatory power of the model.

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