Gestão & Regionalidade

Received: 15/08/2021
Accepted: 19/05/2022

Applications and consent terms: a study on the digital behavior of Brazilians in the pandemic

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Abstract

The digital context and its controversies, analyzed by disciplines that deal with technology and society, achieved academic relevance in the area of Administration. This article sought to examine the behavior of individuals, regarding the capture, processing, and sharing of data during the pandemic, through the lens of a new model of colonialism: data colonialism. We carried out a survey with 516 respondents, from March to May 2020, with different levels of education and age ranges. Results showed an increase in the consumption of communication and entertainment applications, and a reduction in the use of transport and hosting applications. In addition, 37% of respondents do not believe that their data are used ethically by organizations, and users with the highest educational levels are those who read the consent form the least . Such facts characterize the opacity of algorithmic systems, contributing to the sedimentation of data colonialism.
Keywords: applications; consent terms; data colonialism; digital behavior; pandemic.

Citation: Vianna F., Peinado J., Vianna J.R.M.R., Tonon L., & Meneghetti F.K. (2023). Aplicativos, termos de consentimento e o colonialismo de dados: um estudo sobre o comportamento digital dos brasileiros na pandemia *Gestão & Regionalidade*, 39, e20238027. https//doi.org/10.13037/gr.vol39.e20238027

1 Introduction

The advent of the pandemic, declared by the World Health Organization (WHO), led most countries to follow isolation measures, encouraging the adoption of remote activities (Wenham, Smith, & Morgan, 2020). These activities are largely enabled by digital devices and applications, as well as access to service provision (Farooq, Laato, & Najmul Islam, 2020; French & Monahan, 2020). Studies show that digitalization during the pandemic affected consumption behavior, through the adoption of new forms of payment (Kim, 2020; Liu, Pan & Yin, 2020). Social and love relationships developed with greater influence from digital devices (Yarger et al., 2021), and individuals' feelings were affected by fear and insecurity about work (Davidescu et al., 2020; Gasparro et al., 2020), among other aspects of life. As a result, scholars began to observe with greater interest the relationship between digitalization and the consumption of applications (Király et al., 2020; French & Monahan, 2020).

In this scenario, the demand for studies is also related to the increase in the consumption of internet bandwidth, which in Brazil reached almost 30% between January and June 2020 (PAINEL TIC, 2020), and services mediated by internet platform applications (APPs). In this case, 66% of internet users bought products through this channel, and the number of people who ordered a meal through APPs has tripled, compared to 2018, reaching 44% of network users (PAINEL TIC, 2021). This information justifies the unprecedented financial results of organizations that make up the digital ecosystem (Collins, Ocampo, & Paslaski, 2020). These companies capture and process data produced by the social relationships developed by users in the applications, from computing devices such as smartphones, characterizing a new model of colonialism (Couldry & Mejias, 2019a). This model has a process known as ‘datafication’, which quantifies and shares user relationships, or even commoditizes them, according to these firms’ interests (Leonardi & Treem, 2020; Mejias & Couldry, 2019).

The limits and guidelines about the processes that involve companies and their applications are defined by documents called “consent terms”. These documents present three relevant aspects that refer to the topic of this research. First, they are developed by the firms themselves, in a unilateral and imposing way (Venturini et al., 2016; Belli & Venturini, 2019). Second, these documents are not always easily accessible on the platforms, are lengthy, and use fancy languages (Belli & Venturini, 2019; Zuboff, 2019). Finally, users do not have the habit of fully reading them (Obar & Oeldorf-Hirsch, 2020). Therefore, the digital ecosystem ceases to act as a business model based on transparency and trust among its actors, by allowing organizations mediated by algorithms to have opaque processes.

In brief, this article intends to contribute to discussions on the context of a pandemic and a potential relation with the phenomenon of data colonialism. Individuals’ increased consumption of the internet and services mediated by applications during the pandemic can result in a more significant process of datafication, justifying, at least in part, the results of large companies in the digital ecosystem. Information and consent on the capture, processing, and sharing of users’ data by applications are mediated by documents developed unilaterally and quiet difficult to read, making easy the colonialism of these data. Therefore, the objective of this article is to analyze the behavior of individuals regarding data capturing, processing, and sharing, in the context of the pandemic, under the lens of data colonialism.

To do that, , we carried out a survey with 516 respondents, and data were subjected to statistical tests to answer three operational questions: (i). Was there an increase in the use of application services due to the daily changes imposed by the COVID-19 pandemic?; (ii). What is the behavior of application service users regarding the importance of reading consent terms?; and (iii). Does a positive or negative perception of platform organizations' utilization of data extracted from applications influence users' practice of reading the terms of consent?

After this introduction, Section 2 presents a theoretical background on Covid-19, digital behavior, data colonialism, and consent terms. In section 3 we show the methodology used for data collection and analysis; section 4 shows the results, section 5 the discussion, and section 6 the final considerations, directions for future studies, and the limitations of this research.

2. Theoretical background

2.1 Covid-19 and digital behavior

The year 2020 was marked by a pandemic caused by a new type of coronavirus, COVID-19 (Who, 2020a). Initially considered a Public Health Emergency (WHO, 2020b), the worsening and spread of the disease resulted in the World Health Organization declaring a pandemic status in March 2020, which naturally included Brazil (Brasil, 2020). Urgent health measures were adopted, since no immunizer or vaccine had been developed yet to fight COVID-19, in addition to the high rate of transmission of the new virus (Fauci, Lane, & Redfield, 2020; Garcia & Duarte, 2020). Following the adoption of sanitary measures, several presential activities were suspended, and social distancing led to educational, social, working, leisure, and family activities being carried out remotely (Wenham, Smith, & Morgan, 2020).).

Given the need for social isolation, as a health measure imposed by the pandemic, many actions and behaviors, once performed face-to-face, are now carried out through social networks and internet service applications, accessed through interface equipment such as smartphones, tablets, laptops, and other devices from the internet of things (IoT) universe (Farooq, Laato, & Najmul Islam, 2020; French & Monahan, 2020). The use and consumption of digital media, social networks, and application platforms have been increasingly addressed in several studies. These involved topics ranging from individuals' perception of their tracking by the State during the pandemic period (French & Monahan, 2020), until the eventual emergence of problems linked to excessive use of the internet (Király et al., 2020). Among the main problems listed in these studies, the development of compulsive behavior through games and social networks among teenagers stand out, in addition to the development of compulsion for internet pornography sites (Camilleri, Perry, & Sammut, 2021; Fernandes et al., 2020), and compulsion for online shopping (Jaspal; Lopes; Lopes, 2020).

In Brazil, in 2020, there was an increase in several areas related to internet consumption: i. 28% growth in daily time spent on mobile apps; ii. Over 25% increase in the number of downloads and spending on iOS and Android apps; iii. Over 30% growth in online shopping apps; and iv. a 20% increase in food delivery apps (Valente, 2020). In addition, the increase in internet bandwidth consumption in Brazil reached almost 30%, between January and June 2020 (Painel Tic, 2020), with services mediated by application platforms (APPs). In this case, 66% of internet users bought products through this

channel, and those who ordered a meal through applications has tripled, compared to 2018, reaching 44% of network users (Painel Tic, 2021).

Applications consist of systems that mediate the relationship between users and digital organizations or service delivery platforms, and operate through algorithms, by capturing and sharing data and information with social networks and other applications, to improve their performance and financial results (Bucher, Schou, & Waldkirch, 2020; Galière, 2020; Lammi, 2020; Srniceck, 2016). From March to May 2020, during the pandemic, the companies Facebook, Amazon, and Alphabet generated earnings for their owners that exceeded eighty billion dollars (Collins, Ocampo, & Paslaski, 2020). According to some researchers, such organizations are part of a system called surveillance capitalism (Zuboff, 2019), platform capitalism (Srnicecck, 2016), data capitalism (Sadowski, 2019), Big Data capitalism (Chandler & Fuchs, 2019), and data colonialism (Couldry & Mejias, 2019a, 2019b). Although the different terms have some similarities and differences, we adopted the term "data colonialism" in this study.

2.2 Data colonialism and consent terms

Researchers around the world have analyzed and proposed theories about new forms of colonialism, such as neocolonialism (Boussebaa, Morgan, & Sturdy, 2012; Murphy & Zhu, 2012; Siltaoja, Juusola, & Kivijärvi, 2019), epistemic colonialism (Ibarra- Colado, 2006), and power colonialism (Quijano, 1999). In general, colonialism, understood as a violent practice consisting of looting natural resources and physical violation of bodies, has been replaced by more refined practices of resource extraction, including forms of knowledge (Mignolo, 2012). In the context of a platform society, Nick Couldry and Ulisses Mejías developed the concept of data colonialism, which is, in essence, "the capture and control of human life itself through appropriating the data that can be continuously extracted from it for-profit" (Couldry & Mejias, 2019b, 190).

Data colonialism occurs through a datafication process, based on the quantification of individuals' social relationships, from their interactions through computational devices (Leonardi & Treem, 2020; Mejias & Couldry, 2019a). This data can be commoditized, as a valuable "commodity", due to its predictive capacity, as well as for being part of other processes within organizations (Razmerita et al., 2020; Vergne, 2020). These would relate to the flow of information in production chains, processes of internal and external relations with employees and customers, and data governance processes. All of them require attention on how data is extracted and processed (Chandler & Fuchs, 2019; Flyverbom, Deibert, & Matten, 2019; Leonardi & Treem, 2020).

Concern with the relationship between organizations and data from users and other stakeholders regards two aspects. First, because data are a valuable raw material for organizations, being considered the new oil (Nolin, 2019). Second, because of the demand for transparency and respect for privacy that emerge, both in the relationship itself and in data capture between users and organizations (Frohman, 2018; Hinds, Williams, & Joinson, 2020; Isaak & Hanna, 2018; West, 2018; West, 2019). This relationship between users and organizations that extract data is agreed upon and mediated by the so-called "consent terms", which are part of the privacy policies, and "cookies", among other documents, which regulate the capture and utilization of users' data by organizations (Belli & Venturini, 2019; Venturini et al., 2016). Terms of consent are instruments that legitimize the activities of capturing and processing data by organizations, and have a

"binding force that can be even stronger than that exercised by law" (Belli & Venturini, 2019, 19).

Studies on consent forms raise questions related to different areas of the digital ecosystem, such as technology and law (Obar & Oeldorf-Hirsch, 2020; Venturini et al., 2016). This interest regards mainly three aspects that form the relationship between organizations, their terms of consent, and their users. First, the organizations themselves develop them, in a unilateral and imposing way. Second, these documents are not always easily accessible on platforms, are lengthy and use fancy languages (Belli & Venturini, 2019; Zuboff, 2019). Finally, users do not have the habit of reading these documents completely (Obar & Oeldorf-Hirsch, 2020). In addition, we can mention the opacity of these digitalized systems, meaning that their users do not understand how their algorithms work (Burrell, 2016; Pasquale, 2015). Therefore, it is possible to state that the meaningful consent (Zarsky, 2019), where users have full knowledge of what happens with their data, is no longer an aspect of these relationships.

Many countries have improved their legislation to regulate e consent terms, as well as the actions of platform companies. The European Union developed the General Data Protection Regulation (GDPR), which was used as a basis by the Brazilian legislative chamber for the creation of Law 13,079/2018 (Brasil, 2018), popularly known in Portuguese as LGPD (General Data Protection Law). LGPD came into effect in August 2020, after being postponed twice, the second time motivated by the pandemic (Brasil, 2020).

Despite the existence of these laws, both GDPR and LGPD face difficulties for being effective. Recent studies show that not all platforms and websites in the European Union have adapted to GDPR, and that the Act itself is incompatible with the reality of Big Data systems, making it ineffective (Utz et al., 2019; Zarsky, 2017). In Brazil, despite LGPD validity and the creation of the General Data Protection Authority, setting up committees and beginning inspections are still incipient, and its strategy is to respond to actions filed by users or civil society (ANPD, 2020).

3 Methodological procedures

Based on the theoretical framework and focusing on intermediary service applications, the following research questions guided the study:

1. Was there an increase in the use of application services by users due to the daily changes imposed by the COVID-19 pandemic?
2. What is the behavior of application service users regarding the importance of reading consent terms?
3. Does a positive or negative perception of platform organizations' utilization of data extracted from applications influence users' practice of reading the terms of consent??

In search of answers to these questions and exploring their possibilities, we carried out an electronic survey to investigate and analyze the behavior of individuals during the pandemic (Moser & Kalton, 2017). To this end, we designed a structured questionnaire, based on two main aspects. First, we developed exploratory versions of the questionnaire for approximately sixty days, based on the selected literature. The exploratory character is due to the absence of studies on the subject in the area of Administration, in Brazil and abroad. The second aspect is the improvement of the topic, based on discussions among researchers throughout this period, making changes and adaptions several times until its conclusion. The questionnaire was structured as follows:

a. Eight statements on a five-point Likert scale, ranging from "decreased a lot" (1) to "increased a lot" (5), with the midpoint "neither increased nor decreased" (3). Of these eight statements, four related to application consumption in the personal sphere, and four in the professional sphere.
b. Four questions with possible answers on a five-point Likert scale, which varied between "Never" (1) and "Always" (5). These four questions refer to respondents reading the applications' terms of consent;
c. Three questions related to control variables: sex, age, and education level;
d. A final question: "Do you consider that the data you provided when embracing the technologies mentioned in the survey are used without harming your privacy and current legislation?" The answers could vary between yes, no, or I don't know.

3.1 Data collection

We initially applied the questionnaire to a pre-test group of 41 persons. As we saw no need to adjust the form, because of some difficulty in understanding or any other problem, we published the questionnaire on social networks and communication platforms, such as Facebook, Instagram, and WhatsApp, using a non-probabilistic sample, made up by our contacts, to start a "snowball". According to Bickman and Rog (2008), a non-probabilistic sample is efficient in studies involving scattered groups, where the identification or location of the population is not limited to a certain region, as was the case in this study. The survey was carried out from March to May 2020, and we got answers from 516 respondents.

3.2 Data analysis

We submitted data to statistical analysis using the software Statistical Package for the Social Sciences (SPSS), version 23. Confirmatory descriptive analyses were done using exploratory data analysis (AED). We also analyzed the mean and standard deviation of the research variables, followed by parametric tests to examine the relationship between the independent variables (gender, age, education, and perception of data use) and the dependent variables.

Therefore, we carried out the following tests:
1) Pearson's correlation test, to check the existence of a correlation among the independent variables;
2) T-test of independent samples, to check differences between two groups of the same variable, and which were suitable in cases involving a categorical independent variable and a continuous independent variable (Pallant, 2013; Hair et al., 2006). In that case, the categorical independent variable was "sex".
3) Finally, we did the ANOVA test between variables with more than three groups. For example, the difference in the average of answers for a dependent variable (on a Likert scale) related to the independent variable 'age range', which has three options (groups); or to the independent variable 'education', which has four options (groups). We used the test to check if there was a difference in responses by groups of people of different age ranges or education levels (Pallant, 2013).

4. Results

Most respondents are female (63.2%), 36.3% are male, and 0.5% did not answer this question. As to age group, respondents between 18 and 30 years old prevailed, with 42.9%, 32% were between 31 and 40 years old, and 14.6% had between 41 and 50 years old. The group between 51 and 60 years old represented 6.6%, and those over 60 years old were 3.9% of the respondents.

Regarding schooling1.2% completed elementary school, 1.4% did not finish high school, 4.3% completed high school, 28.1% have not completed an undergraduate course, and 20.3% have an undergraduate degree;, 20.7% of the respondents have a *lato sensu* graduate degree, 19.1% hold a master's degree, and 4.9%, a PhD degree.

For 34.9% of the respondents, the use of their data do not harm their privacy or current legislation. For 37.8%, it does harm their privacy or current legislation, and 27.3% did not know.

Table 1 presents the average responses for each of the eight statements related to the consumption of apps by participants; the first four refer to the professional sphere and the other four related to the consumption of apps in the personal sphere. The possible response scale ranged from 1 (decreased a lot) to 5 (increased a lot).

Table 1
Mean and standard deviation of participants' responses on application use.

Assertion	Mean	S. D.
Professional sphere		
1. Your use of transportation and location service applications (Uber, 99, Cabify, Easy, Moovit, Google Maps, Apple Maps, etc.)	2.05	1.18
2. Your use of lodging and hospitality service applications (Airbnb, Trivago, Booking.com, Hotéis.com, Trivago, etc.)	1.85	1.05
3. Your use of Communication apps (WhatsApp, Skype, Messenger, Telegram, Hangout, Google Meet, FaceTime, WebEx Meet, Zoom, etc.)	4.31	0.87
4. Your use of Entertainment apps (Netflix, YouTube, Globosat Play, Telecine, Premiere, etc.)	3.83	0.86
Personal sphere		
5. Your use of transportation and location service applications (Uber, 99, Cabify, Easy, Moovit, Google Maps, Apple Maps, etc.)	2.08	1.16
6. Your use of lodging and hospitality service applications (Airbnb, Trivago, Booking.com, Hotéis.com, Trivago, etc.)	2.01	1.05
7. Your use of Communication apps (WhatsApp, Skype, Messenger, Telegram, Hangout, Google Meet, FaceTime, WebEx Meet, Zoom, etc.)	4.13	0.88
8. Your use of Entertainment apps (Netflix, YouTube, Globosat Play, Telecine, Premiere, etc.)	3.97	0.91

Data in Table 1 show that the use of transportation and hosting service applications has decreased since the beginning of the pandemic, both personally and professionally. On the other hand, communication and entertainment applications had an increase in their use, also in both spheres.

Table 2 presents the mean of the answers for each of the four questions related to the habit of reading the consent forms of applications. The response scale ranged from 1 (Never) to 5 (Always).

Table 2
Mean and standard deviation of answers on the frequency of reading consent forms.

Questions	Mean	S. D.
How often do you read the terms of consent for transportation and location service apps (Uber, 99, Cabify, Easy, Moovit, Google Maps, Apple Maps, etc.)?	1.94	1.11
How often do you read the consent terms of accommodation and hospitality services applications (Airbnb, Trivago, Booking.com, Hotéis.com, Trivago, etc.)?	2.28	1.31
How often do you read the consent terms of Communication apps (WhatsApp, Skype, Messenger, Telegram, Hangout, Google Meet, FaceTime, WebEx Meet, Zoom, etc.)?	2.06	1.28
How often do you read the consent terms of Entertainment apps (Netflix, YouTube, Globosat Play, Telecine, Premiere, etc.)?	2.08	1.28

The results show that most respondents "rarely" read the consent terms, regardless of the application.

4.1 Pearson's Correlation Test

We carried out a correlation analysis between the variables of application use in an exploratory way, to check which behaviors would correlate. For the analysis of correlation intensity, we adopted the correlation measure according to the parameters of Cohen (2013): values between r = 0.10 and 0.29 indicate low correlation, values between r = 0.3 and 0.49 indicate average correlation, and values between 0.5 and 1.0 indicate high correlation. Table 3 shows these values.

Table 3
Correlation between indicative variables of app use during the pandemic.

Variable	1	2	3	4	5	6	7	8
Professional sphere								
1. Your use of transportation and location service applications	-	**.613**	-.039	.005	**.693**	**.506**	-.086	.001
2. Your use of lodging and hospitality service applications	**.613**	-	-.100	-.163	.445	**.753**	-.108	-.056
3. Your use of Communication apps.	-.039	-.100	-	.287	.037	-.015	**.545**	.162
4. Your use of Entertainment apps.	.005	-.163	.287	-	.083	-.043	.187	**.562**
Personal sphere								
5. Your use of transportation and location service applications	**.693**	.445	.037	.083	-	**.573**	-.141	-.087
6. Your use of lodging and hospitality service applications	**.506**	**.753**	-.015	-.043	**.573**	-	-.219	-.161
7. Your use of Communication apps.	-.086	-.108	**.545**	.187	-.141	-.219	-	.396
8. Your use of Entertainment apps.	.001	-.056	.162	**.562**	-.087	-.161	.396	-

Data presented in Table 3 indicate high correlations between the variables that represent the same applications, in the different spheres, showing that the behavior of application use varied in the same way, both in the professional and personal spheres. The variable "use of application of transportation and location service" has a strong

correlation with the variable "use of application of lodging and hotel services", both in the professional sphere (.613) and in the personal sphere (.506). This strong correlation indicates that respondents have similar behaviors regarding these applications.

Table 4 shows the correlations between the frequencies of reading the applications' consent forms.

Table 4
Correlation table between the continuous variables regarding the frequency of reading application consent terms.

Variable	1	2	3	4
1. How often do you read the terms of consent for transportation and location service apps?	-	**.616**	**.779**	**.718**
2. How often do you read the consent terms of accommodation and hospitality service applications?	**.616**	-	**.538**	**.561**
3. How often do you read Communication apps' consent terms?	**.779**	**.538**	-	**.764**
4. How often do you read Entertainment apps' consent terms?	**.718**	**.561**	**.764**	-

Data indicate high correlations between all the variables that represent the frequency of reading the consent forms. This means that the behavior of low reading rates of consent terms occurs for any type of application.

4.2 T-test of gender influence on perception

Table 5 presents the results of the t-test on the influence of respondents' gender on the consumption of apps after the beginning of the pandemic, and the frequency of reading their consent forms. Initially, we checked if all variables met the assumption of equal variance - if the variance for the two analyzed groups (male and female) was the same. The assumption of equal variance is not refuted if the significance level of Levene's test is equal or higher than 0.05 ($p > 0.05$), observed in column 2. Then, the bilateral significance is analyzed in column 3, where the value must be less than 0.05 ($p < 0.05$), to check if there is a statistically significant difference between the means of the analyzed groups.

Table 5
Levene's test and bilateral significance for difference in app consumption in the pandemic and reading of consent terms, according to respondents' gender

Variable	Levene's test – Sig. (P>0,05)	T	Sig. (bilateral) (p<0,05)
App. use			
Professional sphere			
1. Your use of transportation and location service applications	**.670**	1.196	.233
2. Your use of lodging and hospitality service applications	.022	2.575	.011
3. Your use of Communication apps	**.272**	-1.032	.303
4. Your use of Entertainment apps	**.838**	.693	.489
Personal sphere			
5. Your use of transportation and location service applications	**.737**	1.123	.262
6. Your use of lodging and hospitality service applications	**.270**	1.917	.056
7. Your use of Communication apps	**.517**	-2.137	**.033**
8. Your use of Entertainment apps	**.287**	.112	.911
Frequency of reading consent terms			
9. How often do you read the terms of consent for transportation and location service apps?	**.590**	-1.463	.144

10. How often do you read the consent terms of accommodation and hospitality services applications?	.016	-2.163	.031
11. How often do you read Communication apps' consent terms?	.020	2.290	.022
12. How often do you read Entertainment apps' consent terms?	**.274**	-.992	.321

In the case of the variables analyzed in Table 5, only variable 7 "Use of Communication apps" met both assumptions. The calculation to measure the effect of the variable "gender" on variable 7 indicated that only 0.9% of the variance can be attributed to that variable. The result was considered small (Cohen, 2013).

4.3 Analysis of variance (ANOVA) between groups with subsequent testing - influence of age, education level, and perception of data use by the platforms on the variables

Initially, the analysis intended to check the significant difference in variance of the means presented by different age ranges. Participants were divided in five groups (1 = "between 18 and 30 years old"; 2 = "between 31 and 40 years old"; 3 = "between 41 and 50 years old"; 4 = "between 51 and 60 years old"; and 5 = "over 61 years old"). Table 6 shows the variables that met the assumption of homogeneity of variance verified by Levene's Test ($p > 0.05$), and, later, the variables whose means present statistically significant differences between groups ($p < 0.05$).

Table 6
Levene's test and bilateral significance for difference in app consumption in the pandemic and reading of consent terms, according to respondents' age range

Variable	Levene's test – Sig. (P>0,05)	Sig. (bilateral) (p<0,05)
App use		
Professional sphere		
1. Your use of transportation and location service applications	**.216**	.414
2. Your use of lodging and hospitality service applications	**.640**	.524
3. Your use of Communication apps	**.498**	.577
4. Your use of Entertainment apps	.000	.001
Personal sphere		
5. Your use of transportation and location service applications	**.474**	.579
6. Your use of lodging and hospitality service applications	**.739**	.706
7. Your use of Communication apps	**.120**	.137
8. Your use of Entertainment apps	.000	.000
Frequency of reading consent terms		
9. How often do you read the terms of consent for transportation and location service apps?	.000	.001
10. How often do you read the consent terms of accommodation and hospitality service applications?	.000	.000
11. How often do you read the Communication apps' consent terms?	.000	.000
12. How often do you read the Entertainment apps' consent terms?	.001	.003

Table 6 shows that no variable met both assumptions. This means that none of the 14 variables in Table 6 was significantly affected by respondents' age range.

Next, the analysis checked the significant difference in variance of the means, presented by groups of different levels of education. Participants were divided into five groups (1 = "complete elementary school; incomplete high school; complete high school"; 2 = "incomplete undergraduate"; 3 = "complete undergraduate"; 4 = "complete *lato sensu* graduate course"; 5 = "master's or PhD"). Table 7 presents the variables that met the assumption of variance homogeneity checked by Levene's Test ($p > 0.05$), and,

later, the variables whose means show statistically significant differences among groups ($p < 0.05$).

Table 7
Levene's test and bilateral significance for the difference in app consumption in the pandemic and reading of consent terms, according to respondents' level of education.

Variable	Levene's test – Sig. (P>0,05)	Sig. (bilateral) (p<0,05)
App use		
Professional sphere		
1. Your use of transportation and location service applications	**.147**	**.001**
2. Your use of lodging and hospitality service applications	.000	.002
3. Your use of Communication apps	**.258**	.856
4. Your use of Entertainment apps	**.334**	**.000**
Personal sphere		
5. Your use of transportation and location service applications	.012	.000
6. Your use of lodging and hospitality service applications	.001	.000
7. Your use of Communication apps	**.383**	.340
8. Your use of Entertainment apps	**.772**	**.000**
Frequency of reading consent terms		
9. How often do you read the terms of consent for transportation and location service apps?	.002	.003
10. How often do you read the consent terms of accommodation and hospitality service applications?	**.585**	.146
11. How often do you read the Communication apps' consent terms?	.000	.000
12. How often do you read the Entertainment apps' consent terms?	**.177**	**.023**

Variables 1, 4, 8, and 12, marked in bold in column 3 of Table 7, confirmed the assumption of homogeneity of variance.

Variable 4 'use of entertainment applications in the professional sphere' showed significant statistical differences between three groups: F (4.419) = 5.223. The ETA Square calculation was 0.05, indicating a low effect of the variable 'level of education' on the variance difference (COHEN, 2013). Subsequent comparisons, using the Tukey HSD test, indicated that the mean result for Group 2 (mean = 4.09, sd = 0.88) was significantly different from Group 4 (mean = 3.73, sd = 0 .81) and Group 5 (mean = 3.62, sd = 0.80).

Variable 8 "use of entertainment applications in the personal sphere" showed significant statistical differences between three groups: F (4.501) = 5.231. The ETA Square calculation was 0.04, indicating a low effect of the level of education variable on the variance difference (COHEN, 2013). Subsequent comparison, using the Tukey HSD test, indicated that the mean result for Group 2 (mean = 4.24, sd = 0.86) was significantly different from Group 3 (mean = 3.84, sd = 0 .93) and Group 5 (mean = 3.78, sd = 0.87).

Variable 1 "use of transportation and location apps in the professional sphere" showed significant statistical differences between groups: F (4.380) = 4.910. The ETA Square calculation was 0.05, indicating a low effect of the variable 'level of education' on the variance difference (COHEN, 2013). Subsequent comparison, using the Tukey HSD test, showed that the mean result for Group 1 (mean = 2.70, sd = 1.32) was significantly different from Group 4 (mean = 1.91, sd = 1 .23) and Group 5 (mean = 1.75,

sd = 1.00), while the mean result for Group 3 (mean = 2.31, sd = 1.17) was significantly different from Group 5 (mean = 1.75, dp = 1.00).

Variable 12, 'frequency of reading consent forms for entertainment applications' showed statistically significant differences ($p < 0.05$) between groups: F (4.494) = 2.872. The ETA Square calculation was 0.02, indicating a low effect of the variable 'education level' on the variance difference (COHEN, 2013). Subsequent comparisons, using the Tukey HSD test, indicated that the mean result for Group 1 (mean = 2.73, sd = 1.49) was significantly different from Group 2 (mean = 2.05, sd = 1 .32), and from Group 3 (mean = 1.87, sd = 1.16).

Finally, we analyzed data from the final question of the survey: "Do you consider that the data you provided when adhering to the applications mentioned in the research are used without harming your privacy and the current legislation?" One hundred seventy-nine persons (34.7%) answered 'yes', 194 (37.5%) answered 'no', and 140 (27.1%) answered 'I don't know'. The analysis that checked significant differences in means' variance, presented by groups of respondents with different perceptions about the use of data by app organizations, did not achieve results that met the assumptions of significance among these three groups.

5 Discussion

The presented data, together with the literature review, raised the need for discussing the topics proposed here. Therefore, we resumed the guiding questions presented in the methodology section, here highlighted as subheadings.

5.1 Was there an increase in the use of application services due to the daily changes imposed by the COVID-19 pandemic?

According to the survey data, the use of transportation and location applications, together with accommodation and hospitality applications was reduced, while communication and entertainment applications had an increase. These data follow WHO guidelines for the non-spreading of the Covid-19 virus, such as social distancing and working at home (home office), for those who could adopt it. Data also confirm the research done by the Annie App organization (VALENTE, 2020), showing an increase of 28% in the time spent by Brazilians with applications, 30% in consuming purchase applications, and 20% in consuming intermediate service applications.

In addition, the study showed that this increase in application consumption is correlated, both in the professional and personal spheres, leading to two possibilities: an overlap between personal and professional life, due to the pandemic; or difficulty of the participants to separate their professional lives from their personal lives. Moreover, the decrease in the consumption of transportation and location service applications and lodging and hospitality service applications, together with the strong correlation between the responses for these applications, are justified by the adoption of isolation measures and remote activities (WENHAM; SMITH; MORGAN, 2020), as a way to fight the pandemic. With people at home, and not traveling for leisure or work, their behavior regarding these apps show correlation.

Another interesting research finding was that groups formed by individuals with lower education levels were using entertainment apps more in the professional and personal spheres, and transportation and location apps in the professional sphere, than

individuals with a higher degree of schooling, especially those with *stricto* and *lato sensu* graduate degrees.

5.2 What is the behavior of application service users regarding the importance of reading consent terms?

Research data shows that the means of the responses about reading consent terms are correlated across all types of apps. This means that reading the consent form does not depend on the type of service application. On average, participants rarely read the consent terms of the applications described in the research. These data support concerns raised by Belli and Venturini (2019) and Zuboff (2019), about the ineffectiveness of documents that are prepared by organizations s. In addition, our data confirm the studies by Obar and Oeldorf-Hirsch (2020), where they found that 74% of the participants chose to "skip" reading the privacy policies of a social network. As it is often the only way to break the opacity of platforms and algorithms, and get information about data capture and processing, the option of not reading the terms is close to subtle colonialism, without violence, but which appropriates the most diverse personal data of users (COULDRY; MEJÍAS, 2019b).

Another interesting finding concerns the influence of education on reading consent forms. The survey showed a statistically significant difference between groups of respondents with different levels of education. In this case, while the group formed by respondents with a degree lower than high school, on average, said they sometimes read the consent forms, the groups formed by participants with incomplete and complete higher education said, they never or seldom read the consent terms.

In order to give more transparency to the relationships with stakeholders (FROHMAN, 2018; HINDS; WILLIAMS; JOISON, 2020; ISAAK; HANNA, 2018), our data present an opposite behavior, showing the opacity of application systems (PASQUALE, 2015), and their one-sided position (BELLI; VENTURINI, 2019; ZUBOFF, 2019) can discourage reading these terms. In addition, the fact that people are going through a period of isolation and social distancing, depending more on the services mediated by apps, can be an aspect that involves the decision to read or not the consent forms, since not accepting them prevents the use of these apps (VENTURINI et al., 2019).

5.3 Does a positive or negative perception of platform organizations' utilization of data extracted from applications influence users' practice of reading the terms of consent?

Data did not show a statistically significant relationship between the perception of data being used by the applications and reading of their consent forms. However, over 37% of participants said they believe that their data use does not violate their privacy or current legislation, and over 27% said they do not know. Data on this negative perception of users about applications may also reflect the absence of an effective legislation to guide the relationship, where, in most interactions, the individual has less power.

6 Conclusion

This article sought to analyze the digital consumption behavior of intermediary service applications in Brazil, during a given moment of the pandemic caused by COVID-

19. The three questions that guided this study were fully answered, showing that we achieved the proposed goals.

We conclude that the consumption of entertainment applications increased among the participants, while transportation/location and accommodation/hotel applications showed a reduction. However, the reduction in the consumption of transportation/location applications was lower among participants with a lower education level - up to high school-, and the use of entertainment service applications in the professional sphere was higher among respondents in the same group. In addition, when asked about how often they read the applications' consent terms that guide the relationships for capturing, processing, and sharing their data, participants said, on average, that they rarely read such documents.

In short, empirical research data were relevant by allowing us to perceive that a pandemic may represent the sedimentation of a new model of colonialism, the "colonialism of data" (COULDRY; MEJÍAS, 2019a). Unlike physical colonialism or neocolonialism, aimed at capturing knowledge (MURPHY; ZHU, 2012; SILTAOJA; JUUSOLA; KIVIJÄRVI, 2019), data colonialism subtly captures and quantifies the behaviors of individuals in order to capitalize and commodify them. This discussion becomes even more complex when showing a higher correlation, thus a lower distinction, between personal and professional life of individuals, who allow capturing their data in the most different spheres of their lives.

Understanding how data colonialism is established still involves another aspect revealed by the research: the participants' perception of the use of their data by the organizations that own the applications is not consistent with building transparent and respectful relationships for users' privacy. In addition, although the terms of consent represent the limits of the organizations' performance, the absence of effective legislation to protect citizens/users makes the digital ecosystem a favorable scenario for abuses and unbalanced actions, reaffirming the characteristics of appropriation by the "colonizers".

Finally, an important element to complement the understanding of data colonialism is to demonstrate that the opacity of applications and their algorithmic systems, as well as their ubiquity, can reduce users' efforts to seek information about the capture, process, and sharing of their data. This situation, together with the other aspects presented, can bring negative results in the social, political, and economic spheres, in the medium and long term.

The research, therefore, presents contributions both to practice and to theory, in the field of studies on organizations. The theoretical contribution refers to the advancement of discussions on new models of colonialism, especially as it is applied in a country with a history of experiencing it in its different forms. In addition, the issue of data colonialism is little explored in studies of organizations and management. Finally, we expect that the conceptualizations of colonizing organizations and their behavior towards users can help future studies on the subject, in the area of Administration. In this sense, the very relationship between the terms of consent and the theory of data colonialism shows an important path not explored in the literature, so far. The practical contribution of the study regards the behavior of the organizations that make up the digital ecosystem and their relationships with stakeholders, to reduce power imbalances in relationships and build more transparent environments and equal societies. In addition, the pandemic context highlighted the need for greater care about what individuals consume in the digital context, also suggesting a stronger surveillance of governance bodies on the performance of organizations mediated by applications.

Limitations of the present study rest mainly on the absence of more specific data related to the respondents, such as their professions or work regimes. Hence, the results point to possibilities for future research on the behavior of different groups of application users, especially through qualitative research that may deepen our findings.

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