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ORIGINAL ARTICLE

Effects of Living Conditions, Political Orientation, and Empathy on Behaviors and Attitudes During the COVID-19 Pandemic: a Study in the Brazilian Context

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Abstract

For a year now, the world has been facing the pandemic of COVID-19, which has affected many sectors of society in an unprecedented proportion. The main objective of this paper was to investigate whether there are relationships between empathy, prosocial behavior, and adherence to measures to fight COVID-19 in a sample of Brazilian participants. Results point to the influence of education, living conditions, political orientation, and empathy on the adoption of measures to contain the virus, and on personal impressions regarding the disease. Specifically, participants with more years of education, with better conditions of practice social distancing, and those who identified themselves as leftist or center-leftist were more favourable to adopting virus containment measures and to practicing physical distancing. Higher levels of empathy were also associated to more positive attitudes concerning those measures. It is argued that political polarization and divergences between discourses by scientists, health authorities, politicians, and the Brazilian rulers may be reinforcing the perception of division in society. This, in turn, inhibits the building of a collectivistic view concerning COVID-19, which would be crucial to cope with the pandemic.

Keywords Pandemic · Behaviors · Attitudes · Brazil · Political Polarization · Empathy

The COVID-19 is an infectious disease caused by the SARS-COV-2 virus. It was firstly identified in December 2019, in the city of Wuhan (China) after an outbreak of pneumonia caused by a pathogen until then unknown. Since then, the disease

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spread all over the world. On January 30th, 2020 the World Health Organization (WHO) declared it a Public Health Emergency of International Concern. On March 11th of that same year, the WHO characterized the COVID-19 as global pandemic (World Health Organization, 2020a; 2020b).

As of October 19, 2021, there were 240,631,670 cases and 4,899,169 deaths confirmed all over the world (World Health Organization, 2020a). On that same date, Brazil had 21,644,464 cases confirmed and 603,282 deaths. Data, however, suggest that the number of cases may be much higher, considering the estimated under-notification rates for Brazil (Orellana et al., 2021).

Several factors are associated with the increased viral transmissibility such as mutation of the virus genetic material, transmission by asymptomatic patients, and time required to reach the transmission peak (Chen, 2020) of the infection curve. There is still no specific pharmacological treatment with proved clinical efficacy against the virus that causes the COVID-19. Some countries are using vaccines developed up to now on an emergency basis, and in such a pace that might take months to reach the vaccine coverage required to reduce the virus circulation. Therefore, health authorities recommend politicians and world leaders to focus their efforts on the adoption of actions to foster the population's behavioral changes regarding hygiene habits, respiratory etiquette, use of masks, and physical distancing (World Health Organization, 2020c). These measures contribute to the flattening of COVID-19's epidemiological curve, preventing the overloading of health systems (Giordano et al., 2020; Kraemer et al., 2020; Matrajt & Leung, 2020).

Although being of utmost relevance to contain the spread of COVID-19, physical distancing comes at a big cost to individuals because it implies reducing personal contacts with extremely cherished persons (Pfattheicher et al., 2020a). In addition, it may provoke negative psychological effects, such as increased anxiety, confusion, anger, and even symptoms of post-traumatic stress (Brooks et al., 2020; Cao et al., 2020). Some groups also consider physical distancing as harmful to both the economy and tourism (Ruchir, 2020). However, it is recognized that resistance to the adoption of measures to restrict people's circulation in some places, such as Italy, for example (Carvalho & Kritski, 2020), has contributed to the high number of deaths from COVID-19 by virtue of the expedited spread of the virus (Rettner, 2020).

Personal beliefs and attitudes toward self-care, as well as some sociodemographic traits are predictors of the voluntary adherence to behaviors to prevent the COVID-19 (Clark et al., 2020). For example, men are less concerned about getting infected by the virus when compared to women. Thus, they are less likely to wear face masks than women do (Capraro & Barcelo, 2020). Moreover, previous studies have pointed out to the influence of Political Orientation on people's attitudes and behaviors during the pandemic: individuals who identify themselves on the right-wing are less supportive and less involved in actions that involve physical distancing than those who perceive themselves as being on the left-wing (Barbieri & Bonini, 2021; Ramos et al., 2020). Adherence to conservative ideologies was also associated with more resistance to wear face masks (Brosowsky et al., 2021; Newman et al., 2021).

The lack of cognitive sophistication (measured by analytical thinking, numeracy, basic scientific knowledge, and absurd skepticism) was a predictor of misperceptions about the COVID-19 in samples of participants in the UK, Canada and the

USA (Pennycook et al., 2020). Also, it was observed that personal perception about the pandemic was more strongly associated with commitment to measures that contain the virus spread than traits of personality (Zajenkowski et al., 2020). Another study found that high levels of intolerance to uncertainty were associated with strong intentions of violating physical distancing (Farias & Pilati, 2020) which, in turn, reinforces the role played by situational aspects to explain the population's behavior in emergency situations.

Data available in literature also point out to effects of the pandemic on socio-cognitive and affective skills such as empathy and prosocial behavior. A survey approaching Pakistani students of odontology showed significant improvement on the levels of empathy once the pandemic started (Ghaus et al., 2020). On the other hand, no difference was found regarding the levels of empathy during the pandemic and in the previous year (2019) among ER resident physicians in the USA (Jacoby et al., 2020).

A study developed during the first 3 weeks of the pandemic, comparing pre-pandemic measures in a longitudinal analysis unveiled a decrease in the level of empathic concern and opportunities for prosocial actions, and simultaneous increase in Perspective Taking among adolescents in the United States (Van de Groep et al., 2020). Chen et al., (2020) observed that more empathetic individuals tend to present more signs of anxiety and depression during the pandemic. These findings suggest that, although empathy rises the prosocial readiness and Perspective Taking toward the other, it may negatively affect the mental health of empathetic individuals.

Pfattheicher et al., (2020a) tested if the empathy-generated prosocial motivation contributes to people's greater readiness to adhere to measures aimed at physical distancing during the COVID-19 pandemic. In order to do so, they performed three studies with participants in the USA, England, and Germany. The authors observed the relations between empathy felt for the elderly and compliance with rules on physical distancing during the pandemic, as well as with motivation to voluntarily comply with physical distancing among infected individuals. Moreover, the authors indicated that promoting the induction of empathy for an older individual may enhance motivation to adhere to measures restricting physical contact. These results are related to the fact that, for individuals with financial and material wealth to adhere to physical distancing, the decision becomes a kind of moral dilemma. Their personal desire to keep on performing their activities and to physically interact with other individuals poses a direct conflict to the collective interest and overall well-being of population. In these situations of conflict, empathy would raise the likelihood of individuals to adhere to moral principles oriented to care with the other, even if it implied some kind of loss or personal sacrifice to them (Batson, 2009; Davidov et al., 2016; Eisenberg et al., 2010; Hoffman, 2000). In other words, higher levels of empathy would make people perceive physical distancing as a measure of personal care, but with wide-ranging collective benefits. Hence, these individuals understand they should prioritized physical distancing in detriment of personal satisfaction.

In the Brazilian context, since the beginning of the pandemic, the challenges for implementing physical distancing abounded and still abound (Aquino et al., 2020). Unlike other countries (e.g., China and New Zealand), where the government

isolated villages or entire regions (Anderson et al., 2020), in Brazil no universal guidelines were established to set the need and parameters for enforcing restrictive measures to people's circulation. Rather, it was left up to each of the federation's state and municipality to make their own decisions (De Souza et al., 2020). Furthermore, Brazilians witness a constant clash between the position defended, in one side, by their, and in the other side, by the World Health Organization and scientists' recommendations, especially regarding physical distancing and therapies to fight the COVID-19. Evidence suggests that the positioning of the president of the nation, coupled with the political partisanship of his position supporters, significantly affected people's behavior. This led to lame positive attitudes among supporters regarding social distancing, as well as strong intentions to violate it (Farias & Pilati, 2020).

In addition to these issues, social injustice, high rates of unemployment and informal jobs, and the increased number of people living in irregular housing with several families sharing the same space (Instituto Brasileiro de Geografia e Estatística, 2010) prevent many citizens from adopting the recommended hygiene measures, and discourage part of the population to adhere to the "staying home" measure. Uneven access to public resources, the need to use public transportation, and the need to maintain their jobs are yet other factors that hinder the fight against the pandemic in Brazil. Data point out that the low income responsible for underemployed individuals to leave their residence in order to earn their income, and the unemployed individuals who need to look for a job, were associated with the high intentions to violate social distancing in the country (De Souza et al., 2020).

The results of the study by Pfattheicher et al. (2020a) suggest that empathy and prosocial readiness may contribute to mobilize the population's behavior in the face of a health emergency. However, socioeconomic, educational, and political conditions of the countries where that study was conducted are quite different from those found in Brazil. This leads us to ask whether similar results would also be found in the country. Moreover, Pfattheicher et al., (2020a) study was carried out in the early stages of the pandemic in the USA, Germany, and the UK. Currently, the COVID-19 is rapidly spreading throughout Brazil, and increasing its incidence in rural areas where socioeconomic and hospital conditions are much poorer than in large centers. Not to mention a decreased number of health professionals, which has worried health authorities even more. An example is what happened in some cities in the North Region of Brazil, such as Manaus (AM) and Porto Velho (RO). Such cities experienced a collapse in their health systems and recording high number of deaths due to few ICU beds available, and even lack of oxygen to provide care to patients.

Considering the aforementioned scenario, the main objective of this study was to investigate whether there are relationships between empathy, prosocial behavior, and other variables that reflect adherence to measures to fight the COVID-19 in a sample of Brazilian participants. Also, the study aimed at verifying whether the population's attitudes and behaviors toward the COVID-19 would be associated with the following variables: conditions to practice physical distancing, income, political orientation, sympathy for public manifestations for and against social distancing, and epidemiological data related to the disease progression in Brazil.

Method

Participants

The survey questionnaire was responded by 745 individuals, but responses of 41 participants were excluded from the analysis because of repeated answers ($n = 8$), errors in completing some checking items ($n = 30$), participant's residence abroad Brazil ($n = 2$), or because the participant was a minor ($n = 1$). The final sample was composed of 704 respondents from the five regions of Brazil, with ages ranging from 18 to 68 years. Most of them self-reported as female and living in the Northeast and Southeast regions. Table 1 presents in detail the sociodemographic characteristics and other descriptive statistics of the sample.

Instruments

Sociodemographic, Health, and Political Identification Data

Initially, questions were asked for the sample's sociodemographic characterization (i.e., gender, age, income, education, and place of residence), about the participants' health status (whether they had any comorbidity for COVID-19 or not). Political orientation was assessed through a multiple-choice item adapted from the study by Ramos et al. (2020) that asked the following: In terms of political orientation, how do you define yourself? 1. Clearly left-wing, 2. Center-left (I somehow coincide with some ideas of the left, but not fully), 3. Center (I neither coincide with the left-wing nor with the right-wing), 4. Center-Right (I somehow coincide with some right-wing ideas, but not fully), 5. Clearly right-wing, and 6. I don't know what it means to be left-wing or right-wing.

Behaviors and Attitudes Toward the Pandemic

Five-point Likert-type scales were used to evaluate different aspects of the participants' routines, perceptions, and intentions during the pandemic. The practice of physical distancing was assessed by averaging answers to three items about to which extent had the individual restricted nonessential contacts with other people in different periods of 2020 (I. March, April, and May; II. June, July, and August; III. September and October). Each participant was also asked to evaluate their own conditions to practice physical distancing in those same periods, considering economic-financial and other factors related to profession, household environment (physical infrastructure and sanitary conditions of the residence), their own and their family's health (for additional information, please refer to the supporting material).

Two items were used to evaluate the frequency of (1) wearing masks when leaving home, and (2) adopting measures to contain the virus spread (hand sanitizing, respiratory etiquette, avoid touching and greeting other individuals).

Table 1 Descriptive statistics regarding the sample characterization

DATA	*n*	%
Gender		
Male	184	26.0
Female	512	72.7
Other	8	1.1
Education		
Elementary School	3	0.4
Secondary School	76	10.8
High-School diploma	347	49.3
Undergraduate or college Degree	278	39.5
Region of residence		
North	14	2.0
South	22	3.1
Center-West	37	5.3
Southeast	225	32.0
Northeast	406	57.7
Belong to the risk groups for COVID-19 (has comorbidity or is older than 60 years)?		
Yes	248	35.1
No	459	64.9
Monthly family income		
Up to one minimum wage (R$1,045.00)	155	22.0
From one to two minimum wages	77	10.9
From two to three minimum wages	77	10.9
From three to four minimum wages	59	8.4
From four to five minimum wages	69	9.8
Above five minimum wages	232	33.0
Did not inform income	35	5.0
Frequency that has sought for information about the pandemic?		
Never	14	2.0
Very rarely	130	18.5
Frequently	237	33.7
Very frequently	130	18.5
Always	193	27.4
Main means to obtain information about the COVID-19?*		
Blogs and Internet-based news	490	69.6
TV	430	61.1
Social Networks	415	58.9
Chat with friends and family members	294	41.8
Printed newspapers or magazines	110	15.6
Radio	76	10.8
I have not sought for information about the pandemic	37	5.3
Age $_{\text{Means (SD)}}$	33.26 (12.73)	

* The sum is greater than 100%, because more than one option could be marked

The intention to not practice physical distancing was assessed using nine items that asked whether the participant intended to engage in social activities involving nonessential contact with other people in the next three months (see supporting information). Respondents were also asked to indicate for how long (in months) she/he would be willing to remain practicing more rigorous physical distancing, ranging from 0 (I am no longer willing to practice social distancing) to 6 (6 months or more).

Another item asked to what extent participants agreed with the following statement: "It is important that other people restrict social contact, i.e., practice social distancing, because of the COVID-19 pandemic." In addition to this item, respondents were asked to rate their degree of agreement with statements by public figures (politicians, actors, famous businessmen, physicians, journalists, etc.) about physical distancing which were publicized on the Brazilian media during the pandemic. To that, five speech clippings supportive of and five that criticized the practice of physical distancing were presented, not identifying the authors (see supporting information).

Measures of Empathy and Prosocial Behavior

To measure situational empathy, three items translated from the study by Pfattheicher et al., (2020a) and adapted to the Brazilian context were administered. These items were responded in 5-level scales that asked about to which extent the participant was empathetic to the situation of individuals more vulnerable to COVID-19 (see supporting information). Dispositional empathy, in turn, was assessed with the Interpersonal Reactivity Index—IRI (Davis, 1983) in its version validated in Brazil by Sampaio et al. (2011), which includes 26 items. The IRI comprises four subdimensions (Perspective Taking, Fantasy, Empathic Concern, and Personal Distress) and a general index of empathy.

To assess prosocial behavior, it was used the Prosocial Personality Battery (Penner et al., 1995), translated and adapted in Brazil by Rabelo and Pilati (2013). In the current study, we employed only the subscales of Social Responsibility, Others-Oriented Reasoning, Mutual Moral Reasoning, and Self-Related Altruism, given the other subscales' overlap with what is measured in the other three subscales (Personal Discomfort, Empathic Concern, and Perspective Taking) and the subdimensions of the IRI.

Finally, three attention-checking items were included in different parts of the questionnaire (e.g., "This is a checking item only, please tick number 2").

Data Collection

Data were collected over 9 weeks, from October to December 2020, through an electronic form produced at the Google Forms platform and disseminated through social networks. The study was approved by a human research ethics committee (CAAE: 33660820.2.0000.8267, opinion no. 4,294,751), and participants completed an online informed consent which described the study thoroughly.

Data Analysis

The main dependent variables of the study were: wearing of masks, adoption of measures to contain the virus, restriction of nonessential contacts in three different periods of the pandemic, degree of agreement with the statement about the importance of having everyone practicing physical distancing, and period the respondent indicated to be willing to remain practicing more rigorous distancing. In addition, a variable was computed to measure the intention not to practice social distancing, by summing up the scores of the nine items that asked about things the respondent would do in the coming months ($\alpha = 0.80$; $\omega = 0.81$). Two separate measures were also constructed to evaluate agreement with manifestations for ($\alpha = 0.76$; $\omega = 0.77$) or against ($\alpha = 0.72$; $\omega = 0.73$) physical distancing, based on the sum of the scores assigned to questions that evaluated pandemic-related statements by public figures (five supportive and five critical ones).

The Kolmogorov-Smirnoff tests indicated that data followed a non-Gaussian distribution ($p < 0.005$). Therefore, Kruskal–Wallis and Mann–Whitney tests were used to analyze possible effects of the categorical variables on the main dependent variables. Effect size was calculated from the equation $r = \frac{Z}{\sqrt{n}}$ and expressed in the form of Cohen's d (Cohen, 1988), after conversion using the Effect size calculator for non-parametric tests (Lenhard & Lenhard, 2016).

Spearman's correlation test was used to check for associations between the scalar and ordinal variables. Finally, multiple linear regressions were employed to test the predictive power of the main independent variables on behavior and attitudes during the pandemic.

Results

Friedman's test suggested that participants perceived that both the conditions to perform physical distancing [$\chi^2(2) = 454.43$; $p < 0.001$] and restriction of contacts [$\chi^2(2) = 656.01$; $p < 0.001$] had a significant drop in the time periods evaluated (I. March, April, and May; II. June, July, and August; III. September and October) (Table 2). All peered comparisons of these periods resulted significant ($p < 0.001$), with effect sizes of 0.39, 0.58, and 0.49 for the conditions to practice distancing, and of 0.50, 0.70, and 0.58, for the restriction of nonessential contacts (I x II, I x III, and II x III, respectively). In addition, it was observed that measures regarding

Table 2 Means (standard deviations) for evaluations of the conditions of practicing distancing and on the extent to which participants restricted nonessential contacts with other people

	Pandemic period		
	I	II	III
Conditions of practicing distancing	4.57 (.83)	4.21 (.98)	3.70 (1.10)
Extent to which restricted nonessential contacts	4.67 (.63)	4.24 (.78)	3.67 (.95)

Table 3 Associations between conditions of practicing physical distancing and restriction of nonessential contacts during the pandemic*

	Restricted I	Restricted II	Restricted III
Conditions I (March, April, May)	.44	.25	.15
Conditions II (June, July, August)	.24	.56	.41
Conditions III (September and October)	.13	.42	.60

* All correlations are significant at the level of $p < .001$

Table 4 Means (standard deviations) regarding the adoption of measures to prevent the spread of the virus, restriction of nonessential contacts, and intentions regarding physical distancing in the coming months among participants belonging or not to the risk groups for COVID-19

	Risk Groups		*U*	*p*	*d*
	Yes	No			
Mask and PPEs	4.76 (.56)	4.69 (.56)	52592.00	.037	.11
Measures of containment	4.74 (.55)	4.63 (.62)	51337.00	.009	.15
Restricted (March, April, and May)	4.74 (.60)	4.64 (.64)	51225.00	.007	.15
Restricted (June, July, and August)	4.33 (.77)	4.19 (.78)	50127.50	.007	.18
Restricted (September and October)	3.78 (.89)	3.62 (.98)	51179.50	.028	.15
Time willing to remain practicing more rigorous physical distancing	3.70 (2.28)	2.94 (2.28)	45834.50	< .001	.31
Intention to not practice distancing	16.71 (6.25)	18.54 (6.83)	47590.50	.001	.26
Support distancing	23.41 (2.55)	22.73 (2.86)	47811.00	< .001	.26

conditions to practice distancing, and restriction of nonessential contacts were positively correlated (Table 3).

Participants belonging to risk groups for COVID-19 pointed out that they increased the restriction of their nonessential contacts throughout the pandemic, were willing to maintain strict physical distancing longer and to avoid nonessential contacts in the coming months, and agreed more with positions supporting social distancing, compared to participants who did not belong to risk groups (Table 4). In contrast, there were no differences in recognizing the importance of everyone practicing physical distancing, nor in agreeing with positions that criticized physical distancing by virtue of belonging or not to risk groups.

There was no association between income, behaviors, and attitudes during the pandemic. Age positively correlated with the adoption of measures to contain the virus ($\rho = 0.17$; $p < 0.001$), with restriction of nonessential contacts in the months of June, July, and August ($\rho = 0.15$; $p < 0.001$) and in the months of September and October ($\rho = 0.20$; $p < 0.001$), with the length of time participants would still be willing to remain practicing more rigorous physical distancing ($\rho = 0.26$; $p < 0.001$), and negatively with the intention not to maintain physical distance ($\rho = -0.17$; $p < 0.001$). Political orientation was significantly associated with all dependent variables, with participants who identified themselves as left- or center-left wing

Table 5 Means (standard deviations) regarding the adoption of measures to prevent the spread of the virus, restriction of nonessential contacts, and intentions regarding physical distancing in the coming months by virtue of the participants' political orientation

	Left-wing ($n=227$) [(a)]	C. Left-wing ($n=192$) [(b)]	Center ($n=154$) [(c)]	C. Right-wing ($n=56$) [(d)]	Right-wing ($n=23$) [(e)]	I don't know ($n=52$) [(f)]	H	p	d
Mask when leaves home[1]	4.81 (.45)	4.72 (.56)	4.75 (.54)	4.63 (.59)	4.00 (.95)	4.62 (.62)	33.79	< .001	.41
Hygiene and etiquette measures[2]	4.81 (.47)	4.58 (.65)	4.68 (.59)	4.55 (.60)	4.39 (.89)	4.60 (.63)	25.92	< .001	.35
Restriction (March, April, and May)[3]	4.82 (.43)	4.68 (.60)	4.62 (.68)	4.43 (.87)	4.52 (.94)	4.48 (.67)	26.92	< .001	.36
Restriction (June, July, and August)[4]	4.40 (.67)	4.27 (.79)	4.15 (.78)	4.04 (.93)	3.74 (.91)	4.12 (.80)	23.87	< .001	.33
Restriction (Sep and Oct) [5]	3.85 (.85)	3.61 (.94)	3.58 (.99)	3.52 (1.02)	3.30 (1.25)	3.79 (.97)	13.02	.023	.21
Time willing[6]	3.65 (2.17)	3.07 (2.28)	3.13 (2.29)	2.32 (2.19)	2.26 (2.56)	3.40 (2.59)	21.38	.001	.35
Intention to not practice dist.[7]	16.26 (5.88)	18.22 (6.59)	18.92 (6.82)	19.46 (7.31)	21.39 (7.12)	17.58 (7.58)	26.83	< .001	.31
Agrees with criticism against dist.[8]	6.77 (2.56)	7.66 (3.09)	9.10 (3.76)	10.04 (3.72)	12.61 (4.33)	8.23 (2.94)	101.50	< .001	.80
Agrees with support to dist.[9]	23.76 (1.95)	23.13 (2.93)	22.85 (2.59)	20.73 (3.97)	19.91 (5.93)	23.00 (2.20)	49.93	< .001	.52
Importance of everybody distancing[10]	4.85 (.42)	4.69 (.59)	4.78 (.50)	4.25 (.99)	3.87 (1.35)	4.87 (1.34)	60.87	< .001	.59

1 [(d) ≠ (e): $p = .017$, d = .77; (e) ≠ (f): $p = .011$, $d = .82$; (e) ≠ (b): $p < .001$, d = .65; (e) ≠ (c): $p < .001$, d = .77; (e) ≠ (a): $p < .001$, $d = .69$]

2 [(a) ≠ (d): $p = .010$, d = 1.89; (a) ≠ (b): $p = .001$, $d = .40$]

3 [(a) ≠ (f): $p = .001$, $d = .47$; (a) ≠ (d): $p = .003$, $d = .45$; (a) ≠ (c): $p = .034$, $d = .30$]

4 [(a) ≠ (c): $p = .029$, $d = .30$; (a) ≠ (e): $p = .004$, $d = .47$; (b) ≠ (e): $p = .046$, $d = .40$]

5 [no significant peered comparison]

6 [(a) ≠ (d): $p = .002$, $d = .45$]

7 [(a) ≠ (b): $p = .037$, $d = .28$; (a) ≠ (c): $p = .002$, d = .38; (a) ≠ (d): $p = .034$, d = .36; (a) ≠ (e): $p = .007$, $d = .45$]

8 [(a) ≠ (f): $p = .007$, $d = .40$; (a) ≠ (c): $p < .001$, d = .74; (a) ≠ (d): $p < .001$, $d = .84$; (a) ≠ (e): $p < .001$, $d = .92$; (b) ≠ (c): $p = .001$, d = .42;
(b) ≠ (d): $p < .001$, $d = .60$; (b) ≠ (e): $p < .001$, d = .77; (e) ≠ (f): $p = .003$, $d = .92$; (c) ≠ (e): $p = .013$, $d = .49$]

9 [(a) ≠ (e): $p = .002$, $d = .49$; (a) ≠ (c): $p = .008$, $d = .34$; (a) ≠ (d): $p < .001$, $d = .79$; (b) ≠ (d): $p < .001$, $d = .56$; (d) ≠ (f): $p = .033$, $d = .60$;
(c) ≠ (d): $p = .004$, $d = .51$]

10 [(a) ≠ (b): $p = .022$, $d = .30$; (a) ≠ (d): $p < .001$, $d = .74$; (d) ≠ (f): $p < .001$, $d = .98$; (c) ≠ (e): $p < .001$, $d = .69$; (b) ≠ (d): $p = .002$, $d = .49$; (a) ≠ (e): $p < .001$, $d = .69$; (e) ≠ (f): $p < .001$, d = 1.25; (c) ≠ (d): $p = < .001$, $d = .67$; (b) ≠ (e): $p = .002$, $d = .53$]

All significant levels are adjusted

reporting they were generally more favorable to adopting virus containment measures and to practicing physical distancing (Table 5).

Significant correlations were observed between the perceived importance of everyone practicing physical distancing and the degree of agreement with public statements for ($\rho = 0.48$; $p < 0.001$) and against ($\rho = -0.35$; $p < 0.001$) physical distancing during the pandemic. A review of Tables 6 and 7 shows the existence of weak significant correlations between measures of empathy, prosociability, and behavior and attitudes toward the pandemic.

Multiple linear regression analyses were conducted to test the predictive power of the main independent variables on (1) the distancing practiced since the onset of the pandemic, (2) the intention to not practice distancing in the coming months, (3) the time (in months) that participants reported they were willing to maintain a more rigorous distancing, (4) the assessed importance of everyone practicing distancing, the degree of agreement with statements supporting (5), and criticizing (6) physical distancing. In order to do that, the scores assigned to the three items that asked about the practice of isolation and containment in different periods of the pandemic, and the values assigned to the nine items about the intention to not practice distancing in the coming days were summed up. Regarding time, it was considered the value assigned by respondents to the item about the number of months they informed to be willing to practice more rigorous distancing (0 = no longer willing to practice rigorous distancing; to 6 = still willing to practice more rigorous distancing for 6 months or more).

Analysis was performed in a hierarchical procedure, with the independent variables being inserted into five blocks: the first containing the value corresponding to self-reported conditions to practice distancing and income; the second, belonging to a risk group or not; the third, political orientation; the fourth, dimensions of dispositional empathy and empathy for more vulnerable individuals; and the fifth, prosocial behavior-related measures. For the analysis of the predictive power of political orientation, participants who claimed not to know what it means to be left- or right-wing were excluded from the models. There was no multicollinearity among independent variables. Normality in the distribution of residuals and homoscedasticity of data were confirmed. Cases with unstandardized residuals of values greater than 3 and less than − 3 were removed from the analysis to meet the statistical assumptions of multiple linear analysis (Hair et al., 2009).

The variables conditions of practice distancing ($\beta = 0.58$; $t = 19.67$; $p < 0.001$), belonging to risk group ($\beta = 0.05$; $t = 1.99$; $p = 0.046$), Political orientation ($\beta = -0.11$; $t = -3.85$; $p < 0.001$), Fantasy ($\beta = 0.09$; $t = 2.58$; $p = 0.010$), Personal distress ($\beta = -0.10$; $t = -2.86$; $p = 0.004$), Perspective Taking ($\beta = 0.12$; $t = 3.49$; $p = 0.001$), and Situational Empathy ($\beta = 0.16$; $t = 4.86$; $p < 0.001$) significantly predicted the practice of physical distancing in different periods of the pandemic [F (9, 609) = 67.20; $p < 0.001$; $R^2 = 0.50$]. Regarding intention to not practice distancing in the coming months, the model also proved to be significant [F (13, 616) = 13.23; $p < 0.001$; $R^2 = 0.22$] with the variables Conditions ($\beta = -0.31$; $t = -8.41$; $p < 0.001$), Political Orientation ($\beta = 0.14$; $t = 3.95$; $p < 0.001$), Empathic Concern ($\beta = 0.13$; $t = 2.48$; $p = 0.013$), and Self-Reported Altruism ($\beta = -0.16$; $t = -4.30$; $p < 0.001$) significantly predicting this variable.

Table 6 Associations between empathy and behavior and attitudes toward the pandemic of COVID-19

	GE	EC	PD	PT	FS	EP
Mask when leaving home	.15**	.19**	–	.14**	.09*	.23**
Hygiene and etiquette measures	.18**	.21**	.09**	.19**	.10**	.24**
Restriction (March, April, and May)	.17**	.17**	.09**	.17**	.11**	.25**
Restriction (June, July, and August)	.14**	.15**	–	.19**	.10*	.20**
Restriction (Sep. and Oct.)	.15**	.17**	–	.22**	.10**	.13**
Time willing	.07*	.10**	–	.14**	–	.15**
Will not practice distancing	−.11**	−.10**	–	−.16**	–	−.17**
Criticizes distancing	−.10**	−.12**	–	−.12**	−.10**	−.20**
Supports distancing	.20**	.22**	.12**	.23**	.10**	.28**
Importance of everybody distancing	.24**	.25**	.17**	.20**	.16**	.37**

GE general empathy, *EC* empathic concern, *PD* personal distress, *PT* perspective taking, *FS* fantasy, *EP* empathy for individuals in the risk group

* All correlations are significant at the level of .005

* Correlation is significant at level of .001

Concerning how long participants said to be still willing to maintain physical distancing, the test of the model [F (13, 620) = 8.57; $p < 0.001$; $R^2 = 0.15$] indicated that the variables Conditions ($\beta = 0.22$; $t = 5.78$; $p < 0.001$), Belonging to Risk Group ($\beta = 0.08$; $t = 2.14$; $p = 0.032$), Empathic Concern (β = -0.13; t = -2.35; $p = 0.019$), Situational Empathy ($\beta = 0.08$; $t = 2.00$; $p = 0.046$), and Self-Reported Altruism ($\beta = 0.12$; $t = 3.16$; $p = 0.002$) significantly predicted the number of months that participants reported to be willing to practice more rigorous distancing. Conditions ($\beta = 0.18$; $t = 5.02$; $p < 0.001$), political orientation (β = -0.08; t = -2.32; $p = 0.021$), and Situational Empathy ($\beta = 0.33$; $t = 8.22$; $p < 0.001$) significantly predicted the degree of agreement with the statement concerning the importance to everyone practicing physical distancing [F (9, 595) = 20.76; $p < 0.001$; $R^2 = 0.24$].

With respect to the agreement with positions supporting physical distancing, the model proved to be significant [F (9, 592) = 19.04; $p < 0.001$; $R^2 = 0.22$], with conditions ($\beta = 0.18$; $t = 5.07$; $p < 0.001$), income ($\beta = -0.09$; $t = -2.45$; $p = 0.014$), belonging to a risk group ($\beta = 0.11$; $t = 2.99$; $p = 0.003$), political orientation ($\beta = -0.16$; $t = -4.47$; $p < 0.001$), Perspective Taking ($\beta = 0.08$; $t = 1.99$; $p = 0.047$), and Situational Empathy ($\beta = 0.25$; $t = 6.30$; $p < 0.001$) significantly predicting this variable. Finally, conditions for practicing ($\beta = -0.18$; $t = -5.29$; $p < 0.001$), political orientation ($\beta = 0.36$; $t = 10.58$; $p < 0.001$), Fantasy ($\beta = -0.10$; $t = -2.60$; $p = 0.009$), Personal distress ($\beta = 0.08$; $t = 1.97$; $p = 0.049$), Situational Empathy (β = -0.27; $t = -7.06$; $p < 0.001$), and Social Responsibility ($\beta = 0.08$; $t = 2.37$; $p = 0.018$) significantly predicted agreement with critical positioning toward physical distancing [F (13, 613) = 22.18; $p < 0.001$; $R^2 = 0.32$].

Discussion

The current study aimed to assess whether empathy, prosocial behavior, and other variables would be associated with protective behaviors and attitudes at different times during the pandemic. Our findings suggest that income was not associated with people's behaviors and attitudes toward measures of containment. In contrast, the conditions to practice distancing (structure of the house, need to work, etc.) were associated with the practice of physical distancing during the pandemic, and with the readiness to perform stricter distancing for future months. In line with results from other studies, adherence to social distancing was influenced by people's living and working conditions (Do Bú et al., 2020; Natividade et al., 2020), making it more difficult for those who need to work informally to adhere to isolation measures, because they are unable to remotely perform their work tasks (Wasdani & Prasad, 2020), among other factors.

Thus, pandemic may be making more evident the already remarkable inequalities in the Brazilian society, in which people with wealthier living conditions may enjoy some benefits, while others with poorer conditions need to daily expose themselves to the virus, inside crowded subways and buses, in order to gain their lives.

Table 7 Associations between prosociability and behavior and attitudes toward the COVID-19 pandemic

	SR	MMR	ORR	SRA
Mask when leaving home	–	.13**	.10**	.13**
Hygiene and etiquette measures	− .09*	.20**	.17**	.14**
Restriction (March, April, and May)	− .09*	.20**	.11**	–
Restriction (June, July, and August)	− .12**	.16**	.12**	.08*
Restriction (Sep. and Oct.)	− .10**	.18**	.12**	.15**
Time willing	− .10**	.18**	.17**	.16**
Will not practice distancing	.13**	− .17**	− .18**	− .20**
Criticizes distancing	.14**	− .15**	− .13**	− .08*
Supports distancing	− .08**	.22**	.23**	.15**
Importance of everybody distancing	-.08*	.14**	.14**	.12**

SR social responsibility, *MMR* mutual moral reasoning, *ORR* others-related reasoning, *SRA* self-reported altruism

* All correlations are significant at the level of .005

* Correlation is significant at level of .001

This is completely incompatible with the recommendations by health authorities to prioritize the maintenance of physical distance between people (World Health Organization, 2020c). However, it should be emphasized that this study's sample may not reflect the population's general characteristics, given the high concentration of respondents with higher education level and income above three minimum wages. This variable should be controlled for in further studies.

Participants belonging to risk groups tended to practice more actions to prevent the spread of the virus when compared to people who did not belong to such groups.

This result can be justified by the fact that the most severe cases of coronavirus infection occurred with patients with comorbidities, such as diabetes and cardiovascular diseases (De Souza et al., 2020), and with people aged 60 years or more (Oliveira et al., 2020). Thus, it is understood that greater vulnerability may have led these groups to present more caring practices, evidencing a sense of preservation and concern about themselves and their beloved ones, corroborating what was observed by Tunçgenç et al. (2021).

In contrast, belonging or not to risk groups did not significantly influence the degree of importance assigned to the involvement of everyone in the practice of physical distancing. This contradiction between the practice claimed by the risk group individuals and what they claim to be important unveils a self-centered perspective, since they practice personal care but do not seem to acknowledge the relevance of other people doing the same, hence not expressing concern for the collective well-being. This aspect is also evident by the indication that people in the risk group did not differ regarding the degree of agreement with criticism against distancing. It leads to the assumption that they are considering the disease from a purely personal point of view, not focusing on the collective.

Specifically, regarding empathy and prosocial behaviors, results suggest that empathy for more vulnerable individuals and perspective taking were associated with greater adherence to physical distancing at different moments during the pandemic. This finding suggests that individuals with greater empathy and understanding toward the vulnerability situation of other individuals tend to exhibit more socially responsible behaviors, corroborating previous studies that highlighted the relationships between empathy, justice, and prosocial behaviors (Farrelly & Bennett, 2018; Klimecki, 2019). Similar results have been found in other studies, in which empathy was found to serve as an important motivator that can lead people to adhere to physical distancing (Pfattheicher et al., 2020a), and that related low levels of empathy to weaker practice of measures on pandemic containment (Miguel et al., 2021).

Other studies indicate that empathy may contribute to increasing the motivation of individuals to be immunized (Kelly & Hornik, 2016; Pfattheicher et al., 2020b), which is especially important at these times when mass vaccination represents the most tangible hope for mitigating the pandemic in several countries, including Brazil (Our world in data, 2021). Despite that, there is still a significant number of Brazilians who do not wish to be vaccinated (Amâncio, 2020), which is also a problem in other countries (Elliott, 2020). This contrast demonstrates the low sensitiveness of individuals to the fact that getting vaccinated is an act that, at the same time, is self-protective by ensuring personal non-contamination (Lipsitch & Dean, 2020), and prosocial because it helps other individuals and susceptible groups to protect themselves against the virus.

An unexpected result was that empathic concern significantly predicted the intention to not practice physical distancing in the coming months, contrary to our initial expectations. Based on literature in the field of empathy, it was expected that individuals with greater compassion and concern for others would also show greater intention to adhere to physical distancing, because this practice in a pandemic context is understood as a measure of interpersonal care (Pfattheicher et al., 2020a). It

is assumed that such a result occurred because some respondents may have had an unplanned understanding of the items that were used to measure intention to not practice distancing in the coming months. Perhaps they have attempted to express an intention to engage in behaviors that would represent forms of caring for others, but that would involve the need to interact more intensively with other individuals. For example, voluntary food donation behaviors (e.g., G1 Petrolina, 2020) and meeting friends and family in person to provide some comfort due to loneliness. This last behavior is highlighted as an action that can mitigate the psychic damage from social isolation (Razai et al., 2020), especially when considering the elderly population, which often lacks the means or skills to conduct virtual meetings friends and family with technological devices (Costa et al., 2020). Thus, individuals with higher levels of empathic consideration are likely to have considered the possibility of leaving home more frequently in the coming months in an attempt to provide care actions to those who are more vulnerable during the isolation period. However, this hypothesis needs to be tested in future studies.

Regarding political orientation, our results showed an association with physical distancing during the pandemic, and with stronger agreement regarding public manifestations of support to this practice. This finding is in line with previous research demonstrating that political orientation contributed for the individuals' support to measures of distancing. Individuals who described themselves as "right-wing" offered less support for physical isolation policies and indicated less fear of contracting the SARS-COV-2 virus compared to those who described themselves as "left-wing" (Alexandre et al., 2020; Ramos et al., 2020). Results of the study by Gramacho et al. (2020) point out that individuals' attitudes during the COVID-19 pandemic relate to support/rejection of the current Brazilian government. Those who do not support the government are more concerned about the virus, are more knowledgeable about the disease, and express more intention to get vaccinated than those who declare support for the government. Furthermore, in the first months of the pandemic, supporters of the president Jair Bolsonaro demonstrated more concern with the country's economy than with public health issues, defending the return of labor activities as a strategy to fight the disease (Calvo & Ventura, 2021; Lopes de Oliveira et al., 2021).

As described by Moraes (2020), political polarization in Brazil has been notorious since the June 2013 manifestations, followed by the impeachment of then-president Dilma Rousseff in 2016, and the 2018 presidential elections. To the author, this phenomenon can contribute to differentiate how citizens think and behave, even in the face of a common problem to all the Brazilians, as is the case of the pandemic. Moreover, it leads to the relativization of fundamental Human Rights, such as the right to life. In this context, studies conducted in other countries support the thesis that political polarization damages similar ideals in the face of the pandemic scenario (Allcott et al., 2020; Painter & Qiu, 2021; Rothgerber et al., 2020). The split into opposite poles (left vs. right) resulting from political identification seems to be contributing to a reduced empathy between groups. As Hoffman (2000) argues, individuals' identification with those who are most similar to them (familiarity-similarity bias) contributes to raise awareness and mobilization of the individual in relation to the distress situation of restrict groups. For Batson et al. (1995), when directed

only to those individuals who are part of the group itself, empathy can motivate behaviors considered immoral and favor the creation of a hostile atmosphere.

Evidence produced in a recent study (Tunçgenç et al., 2021) suggests that personal adherence to measures to cope with the pandemic is strongly influenced by perceptions about the behavior of other people closest to the individual. That is to say that individuals tend to follow more the health authorities' guidelines when they perceive that others in their circle of acquaintances do the same. This type of social influence was even stronger than personal approval and approval of others regarding the rules of distancing. That means to say that the behavior of individuals closer to them was more important than what participants believed to be the right thing to do in this pandemic situation.

Political polarization may also help explain the fact that prosocial behavior was only modestly associated with behaviors and attitudes that favor the pandemic control. In a recent study, Han et al. (2021) found that the level of trust in the government was related to prosocial readiness and support to public policies about collective welfare. Low levels of trust in the government were related to attitudes that prioritize immediate and partial benefits. These findings seem to support the idea that, in the Brazilian scenario, opposite discourses between rulers at different spheres (Union, States, and Municipalities) may be leading the population to a decrease in trust regarding decisions and guidelines issued by political authorities, which undermines the construction of a sense of collectivity and prosocial motivation among the population. In pandemic contexts, where everyone is exposed to the same threat, the priority of governments should be the adoption of practices that foster a sense of collectivity among the population. However, what is observed in Brazil is the positioning of political figures who adopt a discourse contrary to what is recommended by scientists and health authorities, discouraging the practice of physical distancing (Melo & Cabral, 2020), relativizing the severity of the disease (Mossa, 2020), and recommending "early treatments" that have no scientific support.

That kind of attitude contributes to political polarization among the Brazilians and hinders the implementation of strategies to combat the pandemic, once the population has received throughout the pandemic crisis discrepant messages about measures that should be adopted in the fight against the disease (Lewnard & Lo, 2020). Another example is found in episodes that led to the resignation of two health ministers in the middle of the pandemic, after they publicly advocated for the practice of physical distancing, were against the large-scale use of Chloroquine in the treatment of COVID-19, and criticized the actions of the federal government.

A study conducted by the Lowy Institute evaluated the performance of different countries during the pandemic considering different criteria, including the number of confirmed cases and deaths. In that survey, Brazil was ranked last, shedding some light on the difficulties faced by the country in fighting the Covid-19 (Lowy Institute, 2021). The chaos in the city of Manaus and other cities in the Northern region due to shortage of oxygen for people in the most serious stage of the disease shows the wrongness of the public policies to fight the pandemic (France 24, 2021). Although Brazil has been pointed out as the worst-performing country in the management of this public health crisis, knowledge arising in behavioral and social

sciences can contribute to change this scenario. As stated by Van Bavel et al. (2020), evidence in these fields plays a relevant role in the implementation of measures aimed at aligning the behavior of individuals with the recommendations made by experts and health authorities.

An example of some themes that can contribute to the issue at hand are the studies on fake news, morality and cooperation, risk perception, discrimination, as well as political polarization. On this last aspect, Van Bavel et al. (2020) also consider that renouncing polarization in favor of promoting a sense of collectivity can lead to successful results during a pandemic, with people being encouraged to perceive a common goal. Thus, there should be a potential reduction in the split of opinions regarding practices that can generate a common welfare for all. This course of action is recommended for opinion leaders and media means. It should be considered that when political polarization is radicalized, individuals of different opinions are perceived as enemies, and the lack of dialogue becomes commonplace. Therefore, based on our findings and other results provided in literature, it is suggested that reducing political polarization in Brazil seems to be a good way to minimize cognitive biases that remain driving individuals to opposite paths, both regarding the behavioral measures needed to contain the advance of coronavirus, and the adherence to vaccination (Moraes, 2020).

Some limitations of this study should be pointed out, including the fact that the sample consisted of a short number of respondents from some regions of the country (North, South, and Center-West). In addition, there was little representativeness of individuals with lower levels of education. These factors mean that the population of Brazil was not properly represented. Another limitation refers to the specific period of time when data collection was carried out, probably reflecting characteristics of a period prior to the second wave of the disease when there was a significant decrease in the number of cases and of deaths from COVID-19 in Brazil. Thus, it is suggested that future studies be carried out with samples that equally comprise the different levels of education and Brazilian regions. Also, it is recommended that experimental studies should be carried out to evaluate possible causal relationships between the variables investigated herein.

Despite these limitations, our findings point out to the role of psychological and social factors in the behaviors and attitudes of Brazilians during the pandemic of COVID-19. They highlight the need for interventions that encourage collective mobilization of individuals, regardless if they belong to risk groups or identify themselves with party "A" or "B." Some initiatives in this sense would involve, as suggested by Tunçgenç et al. (2021), the social influence that people have on others in their closest social circles when showing adherence to pandemic control norms. Moreover, public messages need to be made straightforwardly in order to foster the building of a community sense about a common future, and to promote collective values, emphasizing the effectiveness of these actions when everyone is engaged and contributes to the achievement of these common goals.

Performing actions of that nature, focused on raising awareness, and changing the population's behavior seems to be urgent and crucial. We are going through a moment in which the number of cases of and deaths from COVID in Brazil has risen significantly, reaching a level higher than that during the peak of the disease in

2020. Likewise, the emergence of new variants of the virus threatens the effectiveness of a national vaccination program, which is still moving at a very slow pace and is criticized for misguided decisions and moral scandals (Milhorance, 2021). To that should be added that we are entering a year in the run-up to a presidential election, when political polarization and intensification of hostilities and radicalism can only get worse.

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Data Availability The data that support the findings of this study are open available in the Open Science Framework repository at https://osf.io/y4w7f/?view_only=ed62dbfc1d3940e8ac81d3b620ae445e.

Declarations

Ethics Approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of Faculdade de Integração do Sertão – FIS (protocol number 4.294.751).

Consent to Participate All participants completed an online informed consent which described the study thoroughly.

Consent for Publication All authors approved the manuscript and gave their consent for publication.

Conflict of Interest The authors declare no conflict of interest.

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