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From cosmological breakthrough to normalised disease: A longitudinal study on the social representations of Covid-19

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Studies on the social representations of Covid-19 can make important scholarly and practical contributions such as favouring the understanding of social thought about the emergence of a pandemic and its impacts on different groups and providing insight for the planning of communication about health and health education. Longitudinal studies on the social representations of infectious diseases are scarce. The present study is a longitudinal investigation of the social representations of Covid-19 constructed by middle-class Brazilian adults. We conducted semi-structured interviews with seven participants at three different moments during the pandemic, April-May 2020, September 2020, and May-June 2021, totaling 21 interviews. We analysed the textual data with the Top-Down Hierarchical Classification provided by the software Iramuteq. The results show that participants initially represented Covid-19 as a radical transformation of the world based on spiritual, divine, or teleological explanations. With time, these beliefs became less

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prominent, and the participants represented Covid-19 as a normalised disease with specific symptoms. Science-based beliefs became more prominent with time. We discuss this transformation in the social representations of Covid-19 based on the articulation between social representations and social practices. We also discuss the othering process as a constant feature of the investigated representations and the ideological implications of this process.
Keywords: Covid-19, social representations, longitudinal study, Iramuteq, cognitive polyphasia, social practices.

INTRODUCTION

The Covid-19 Pandemic

Covid-19 is a highly transmissible respiratory disease caused by a virus, SARS-CoV-2. The initial outbreak was identified in the Chinese city of Wuhan in December 2019. Among the most common symptoms are fever, cough, fatigue, loss of taste or smell, and difficulty breathing. The most serious cases of Covid-19 may cause persistent symptoms or death. Contamination occurs via contact with an infected person's secretions, such as saliva droplets, i.e., from person to person (Centers for Disease Control and Prevention, 2022).

In March 2020, the World Health Organisation declared Covid-19 a pandemic. Worldwide, health authorities recommended or imposed a series of public health measures to limit the number of infections, hospitalisations, and deaths. These measures included the 'lockdown' of entire cities (the halting of all non-essential economic and social activity and the advice to stay at home), as well as recommendations to keep physical distance from other individuals and wear face masks (European Centre for Disease Prevention and Control, 2020; Ministério da Saúde, 2021). The impacts of these measures on the lives of billions of people were quite substantive, including various restrictions on social interaction (Fiorillo & Gorwood, 2020). They contributed to large-scale societal problems such as the rise in food insecurity, economic recession, unemployment, and the aggravation of intra-family violence against women (Matta et al., 2021; Onyeaka et al., 2021).

In Brazil, the first case of Covid-19 was reported in February 2020, and the community transmission of the disease was acknowledged the next month (Ministério da Saúde, 2020). In March 2020, Brazilian health authorities identified the first Covid-19-

related death in the country. The Brazilian Ministry of Health followed the international trend and the World Health Organisation's advice to implement lockdowns and ask the public to respect individual physical distance (Ministério da Saúde, 2021). However, alongside the scientific information and advice, large swathes of the population consumed antiscientific and Covid-19 denialist information, especially through social media, which participated in the polarisation of social groups such as pro and anti-Covid-19-vaccine (Machado et al., 2021).

Although the pandemic has affected all social groups in Brazil, its detrimental consequences were stronger in the socioeconomically vulnerable strata of the Brazilian population (Komatsu & Menezes-Filho, 2020). These groups present higher vulnerability to the different forms of exposure to the virus and have worse access to information, diagnosis, and treatment, which are problems added to their precarious habitational, technological, health, and nutritional resources (Onyeaka et al., 2021). Specific groups such as the Indigenous and Black populations suffered more because of the pandemic, and there is evidence of greater long-term detrimental effects among females, which indicates the gender, ethnic, and class intersectionality of the issue (Matta et al., 2021; Komatsu & Menezes-Filho, 2020).

Social Representations of Covid-19

Covid-19 and SARS-CoV-2, or 'the coronavirus' as it became known, were not only new objects but threatening ones, causing major disruption to the lives of billions of people worldwide. As such, they were especially powerful in mobilising individuals, groups, institutions, and entire nations to understand and indeed represent them and adopt pertinent practices. To symbolically construe Covid-19, individuals, and groups actively and creatively mobilised beliefs, values, images, stereotypes, etc., mixed with the circulating scientific information, which they selected and adapted to their ingroups and social context (e.g., Eiguren et al., 2021; Emiliani et al., 2020, Giacomozzi et al., 2022). They constructed social representations of Covid-19 through communication and interaction. Social representations are a practice-oriented type of knowledge that includes theories of common sense (lay explanations) and contributes to the symbolic construction of reality (Moscovici, 1961, 2000).

The theory of social representations posits two universes of knowledge, the consensual and reified universes (Moscovici, 2000). Individuals and groups construct social representations in the consensual universes, where they feel authorised to speak from their own experiences, thoughts, and feelings. In contrast, the reified universe is characterised by the greater or sole value of the word of the expert who speaks in the name of reified knowledge (e.g., science). Social representations combine different forms of rationality as an expression of cognitive polyphasia (Moscovici, 1961). The main function of social representations is to confer familiarity to unknown (and threatening) objects (Moscovici, 2000), such as Covid-19 and SARS-CoV-2. Their functions also include allowing communication and the construction of a common reality; constructing and reinforcing social identity; and guiding and justifying practices (Jodelet, 1999). Two social-psychological processes participate in the construction of social representations - objectification and anchoring. Through objectification, individuals and groups find images to translate abstract notions into a material and visible reality; and through anchoring, they attribute meaning to these images based on deep-rooted cultural and group knowledge, categories, and norms (Moscovici, 1961, 2000; Jodelet, 1999). Social practices may reinforce or transform social representations (Abric, 1994). If modifications in social practices are perceived as irreversible, individuals and groups will produce substantial or radical changes to social representations (Flament, 1994).

Studies have shown that the social representations of Covid-19 were anchored in political, religious, and moral values, and included lay explanations based on conspiracy theories, fake news, and science-and-risk-denialist beliefs, informing risky practices (Apostolidis et al., 2020; Páez & Pérez, 2020), and placing the responsibility for the pandemic on outgroups (Souza et al., 2021). Apostolidis et al. (2020) and Giacomozzi et al. (2022) showed that individuals and groups constructed social representations of Covid-19 based not only on scientific beliefs but also political views, which guided their understanding of science and daily practices. In Brazil, right-wing-oriented individuals had a greater tendency to believe, for example, that the coronavirus had been created on purpose (for example with the aim of instituting international communism) and that hydroxychloroquine was efficacious in the treatment of Covid-19 (Apostolidis et al., 2020; Giacomozzi et al., 2022). The social representations of Covid-19 reflected political polarisation, ingroup-outgroup differentiations, and the blaming of outgroups for the origin and circulation of the

virus (Giacomozzi et al., 2022; Apostolidis et al., 2020; Ittefaq et al., 2022; Páez & Pérez, 2020; Souza et al., 2021).

Studies on the social representations of Covid-19 can make important scholarly and practical contributions such as favoring the understanding of social thought about the emergence of a pandemic and its impacts on different groups; allowing the identification of attitudes and beliefs about Covid-19 in its context of production, indicating how this knowledge is articulated with health behaviour; and providing insight for the planning of communication about health and health education (Eicher & Bangerter, 2015). There is much research on the social representations of infectious diseases, however, longitudinal investigations are scarce (Eicher & Bangerter, 2015; Flick et al., 2015). Longitudinal studies can contribute to the understanding of patterns of construction and consolidation of social representations (Bauer, 2015). The present study is a longitudinal investigation of the social representations of Covid-19 constructed by middle-class Brazilian adults. We studied these representations at three different moments during the pandemic: April-May 2020, September 2020, and May-June 2021. In this paper, we analyse the transformation and consolidation of these social representations throughout the considered period. Our study was exploratory, and our research questions were as follows: how would the participants construct social representations of Covid-19? What would be the main content and ideological implications of these representations? Would these representations change over time? If so, how would they change and what factors could be driving their transformation?

METHOD

Participants

We interviewed seven participants in three different moments of data collection, totaling 21 interviews. We adopted a qualitative approach and recruited a small sample to allow for an extensive and detailed investigation of their social representations. The participants were Brazilian adults, three men and four women, self-declared as middle-class. We decided to recruit middle-class participants for two reasons: (1) the middle-class worldview and interests tend to be more influential on the media and official discourse than working-class perspectives (Hesmondhalgh, 2017; Ribeiro & Bellan, 2021) and (2) we wanted to analyse the ideological implications of these middle-class social representations, i.e., how they

would contribute to the reinforcement and concealment of structural social inequalities. To recruit the participants, we used the snowball technique (Ritchie et al., 2003). Table 1 describes the participants' pseudonyms and sociodemographic information.

Table 1.

Participants (pseudonyms) and Sociodemographic Information.

Participants	**Gender**	**Age (y.o.)**	**Education**	**Work Situation**	**Religion**
Clara	Female	55	Graduate	Full time at home	Evangelical
Elton	Male	68	Postgraduate	Retired	Spiritism
Hugo	Male	68	Graduate	Retired	Agnostic
Julia	Female	80	Primary	Retired	Catholic/Spiritism
Lucas	Male	52	Postgraduate	Full time at home	Candomblé
Margaret	Female	78	Secondary	Retired	Spiritism
Melanie	Female	76	Primary	Housewife	Evangelical

Instruments and Procedures

We conducted individual in-depth semi-structured interviews with the participants. The semi-structured approach to qualitative interviewing involves active listening and allows for the formulation of impromptu questions and probes to explore the interviewee's answers (Howitt, 2019). The semi-structured interview schedule started with the question, 'What do you think is happening to the world?'. The interviewers used this first and broad question to ask follow-up questions for as long as possible in each interview, aiming to capture spontaneous expressions of lay theories about the coronavirus and the pandemic. This technique allowed for the integration of the topics of the interview schedule at the beginning of the interview in the form of a naturally flowing conversation. The following questions in the interview schedule were progressively more specific including the topics of what first came to the participants' minds when they thought about the coronavirus; what the participants knew about the coronavirus, the pandemic, and about how the coronavirus appeared; if their perceptions had changed since the beginning of the pandemic; and what was the piece of information about the coronavirus and the pandemic that had most surprised them. To conduct the interviews, we used the online platforms Zoom, Google Meet, and Skype. After obtaining informed consent from the participants, we audio-recorded the

interviews. We followed all the ethical guidelines for research with human beings in accordance with the Declaration of Helsinki. The study received a positive ethical evaluation from the Kingston University's Committee for Ethics in Research, letter number 1539.

Data Analysis

We transcribed the interviews verbatim and analysed the textual data with the Top-Down Hierarchical Classification (TDHC) method provided by the software Iramuteq (Ratinaud, 2009; Reinert, 1990). Each one of the three moments of data collection constituted a separate *corpus* of text, totaling three data *corpora*. Each data *corpus* comprised the discourse formulated by all the participants in the correspondent moment of data collection. We conducted the TDHC separately for each one of the *corpora*. Since we aimed to compare the social representations constructed in three different moments of data collection, it was important to employ a standardised algorithm for data analysis (the TDHC).

The TDHC divides the text (the *corpus*) into segments of text (e.g., three lines of text) and takes them as the unit of analysis. Then, it sorts all the segments of text into two classes aiming to maximise the difference between these two classes in terms of vocabulary. It applies the same vocabulary-difference-maximisation algorithm to the two formed classes and iteratively to the following ones until a stable set of classes is formed and maximisation of difference is no longer possible (Reinert, 1990). The outcome is a set of classes, i.e., a set of segments of text whose intra-class vocabulary is significantly similar and inter-class vocabulary is significantly different. This outcome is expressed in the form of a dendrogram graph showing the frequency of typical words in a class and the association (chi-square) of each word to the class. The TDHC may provide indications of the socio-subjective positions that individuals adopt when producing their enunciations (Kronberger & Wagner, 2000; Souza, 2020). However, in this study, we used it only as a way of generating categories of segments of text allowing for longitudinal comparison. The classes evidenced trends (dominant meanings) in the perceptions that the participants constructed about the studied objects. We used these trends to name the classes and interpret them. We then interpreted the findings with the theory of social representations.

All interviews were conducted in Portuguese by Brazilian researchers. The data analysis was also performed in Portuguese. The findings highlighted in this paper were then

translated into English by the second author. All passages or words highlighted with quotation marks refer to verbatim transcripts of the interviews.

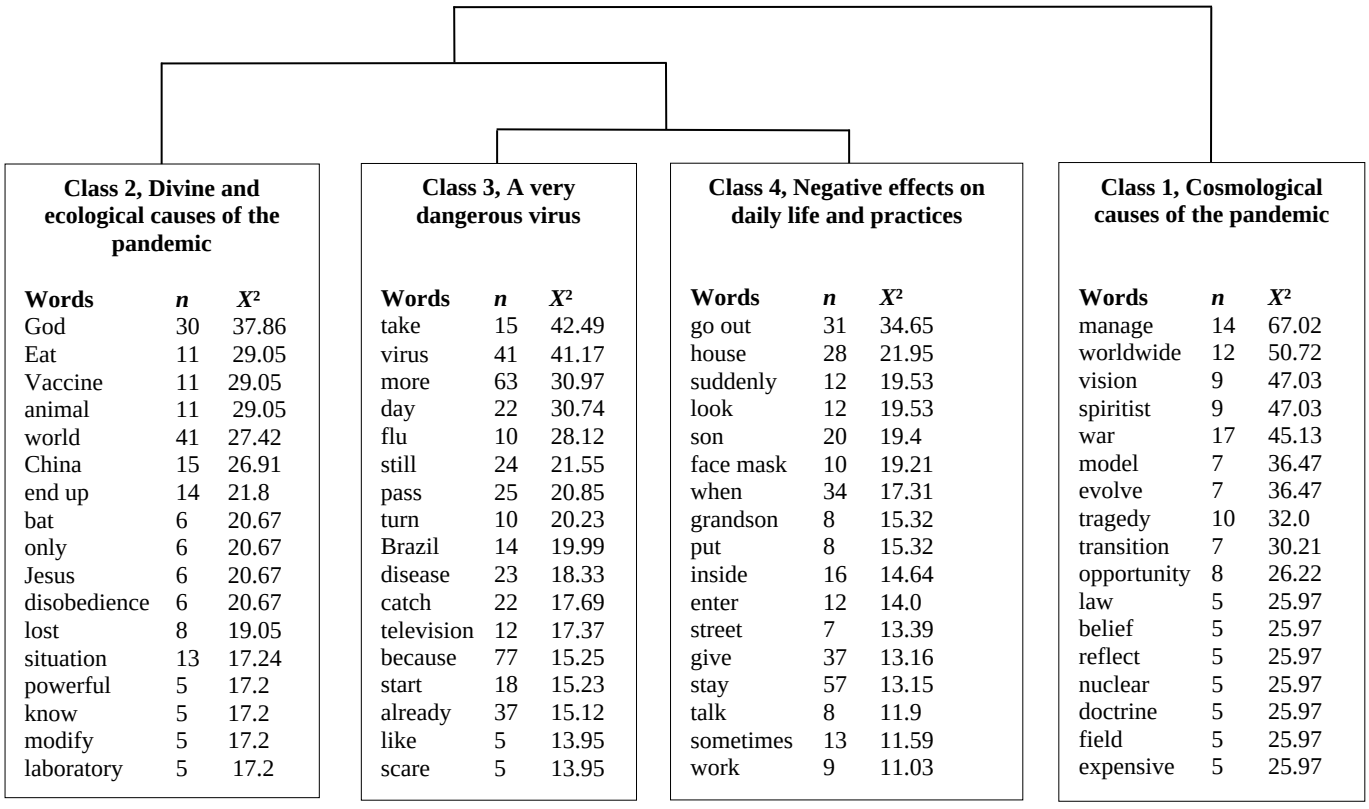
RESULTS AND DISCUSSION

At the Beginning of the Pandemic

We conducted the first interviews in April and May 2020, at the beginning of the pandemic. At that moment, the daily lives of millions of Brazilians, including the study participants, underwent drastic modifications with the first Covid-19 'lockdowns' (Matta et al., 2021). We analysed their interviews with the TDHC. Figure 1 shows the dendrogram that the TDHC generated, with four classes of segments of text grouped according to their vocabulary.

Figure 1

First Moment of Data Collection (April-May 2020). Top-Down Hierarchical Classification of the Participants' Interviews. Frequency and association (chi-square) of typical words in each one of the generated classes of segments of text.



Class 2, Divine and ecological causes of the pandemic

Words	*n*	X^2
God	30	37.86
Eat	11	29.05
Vaccine	11	29.05
animal	11	29.05
world	41	27.42
China	15	26.91
end up	14	21.8
bat	6	20.67
only	6	20.67
Jesus	6	20.67
disobedience	6	20.67
lost	8	19.05
situation	13	17.24
powerful	5	17.2
know	5	17.2
modify	5	17.2
laboratory	5	17.2

Class 3, A very dangerous virus

Words	*n*	X^2
take	15	42.49
virus	41	41.17
more	63	30.97
day	22	30.74
flu	10	28.12
still	24	21.55
pass	25	20.85
turn	10	20.23
Brazil	14	19.99
disease	23	18.33
catch	22	17.69
television	12	17.37
because	77	15.25
start	18	15.23
already	37	15.12
like	5	13.95
scare	5	13.95

Class 4, Negative effects on daily life and practices

Words	*n*	X^2
go out	31	34.65
house	28	21.95
suddenly	12	19.53
look	12	19.53
son	20	19.4
face mask	10	19.21
when	34	17.31
grandson	8	15.32
put	8	15.32
inside	16	14.64
enter	12	14.0
street	7	13.39
give	37	13.16
stay	57	13.15
talk	8	11.9
sometimes	13	11.59
work	9	11.03

Class 1, Cosmological causes of the pandemic

Words	*n*	X^2
manage	14	67.02
worldwide	12	50.72
vision	9	47.03
spiritist	9	47.03
war	17	45.13
model	7	36.47
evolve	7	36.47
tragedy	10	32.0
transition	7	30.21
opportunity	8	26.22
law	5	25.97
belief	5	25.97
reflect	5	25.97
nuclear	5	25.97
doctrine	5	25.97
field	5	25.97
expensive	5	25.97

Note: the titles of the classes were created by the researchers based on their dominant content.

We named the four classes shown in Figure 1 according to the dominant content of their segments of text, as follows: (1) Cosmological causes of the pandemic; (2) Divine and ecological causes of the pandemic; (3) A very dangerous virus; and (4) Negative effects on daily life and practices. The first two classes gathered the participants' explanations for the emergence of the coronavirus and the pandemic. Class 1 mainly included extracts in which the participants explained these phenomena through spirituality and teleology, with words such as 'spiritist', 'transition', and 'opportunity' as typical words. According to the participants, the virus emerged to transform the planet and accelerate human evolution; it had a pedagogical function. The participants described the pandemic as an 'expected tragedy', a 'war' and, at the same time, an opportunity for reflection, awareness-raising, and moral growth. Below are some extracts which illustrate this class:

> "I think we are going through a serious situation, unprecedented really, because we expected that at some point, we could have a world conflict [that would cause suffering but also mark the beginning of a positive transformation of the planet]. And we did not expect that what could be a third world war would come in this format [as a pandemic]" (Elton).
>
> "It is a clear sign of that [the destruction of the environment]. I hope this experience [the pandemic] brings a bit of sense of urgency to our authorities, also in relation to the climate issue. Since if it is not another pandemic, another tragedy may come through the climate issue" (Hugo).
>
> "I think this [the pandemic] was caused by the growth of the population [in China] and the lack of respect of human beings concerning nature" (Lucas).
>
> "Since we believe in the goodness of God, we know that God is sending this virus to us, which is much milder than what could have been a nuclear war"/ "since we are confined [in lockdown], we have the opportunity to reflect [...] [It is] an opportunity for our [moral] growth" (Margaret).

Class 2 mainly gathered extracts in which participants attributed, once more, divine causes to the pandemic, but also human and ecological causes. Typical words were, for example, 'God', 'eat', 'animal', and 'China'. Participants stated that the virus emerged because society needed a moral transformation. They also highlighted material causes of the pandemic, stating that China was responsible for the pandemic, especially the eating habits of the Chinese. Below are some illustrative extracts:

> "I think the coronavirus is shaking us, so we wake up. God is doing this [the pandemic] to show us [we need to change]... because there is so much evil [in the world]" (Julia).
>
> "It seems [that the origin of the virus] relates to the time of the great hunger [in China] because the peasant peoples didn't have anything to eat and would kill anything for food. It seems that this is one factor of the Chinese culture, eating these foods [unconventional animal-derived products]" (Hugo).
>
> "I believe in this theory that people ate wild animals and acquired this disease. [...] There is a lot of strong information saying it [the coronavirus] came from bats" (Lucas).
>
> "The human being, with science, [...] ends up messing with nature and I do believe that the cause of everything that is happening is the disobedience of human beings that turned into chaos, it did turn into chaos. Disobedience is a terrible thing" (Melanie).

Class 3, which we titled 'A very dangerous virus', included extracts in which participants talked about the problems in controlling the worldwide spread of 'the coronavirus'; their difficulty in understanding precisely what the virus was; and their perception of the virus as a great threat. In this Class, 'virus', 'catch', and 'scare' were typical words. Participants highlighted that the virus was spreading fast and that it was serious and lethal. This class

also included extracts about the initial disbelief held by part of the population about the seriousness of Covid-19. The following extracts are representative of these ideas:

> "If we don't take care, it will be very very serious indeed" / "the concern is very strong because it is still an unknown virus. From what I heard, there are now more than 200 mutations of the virus. So, every day we learn more news. It is scary, it is scary" (Clara).
>
> "It is very difficult to control the virus" / "it is a very lethal virus because it hits the lungs, doesn't allow the person to exchange oxygen, and this causes people to suffocate and die in a few hours. In some people, it [the virus] will only manifest when [the disease] is already very serious" (Lucas).
>
> "It is very dangerous. This virus is spreading too much, it spreads like the flu, but it is very dangerous" (Melanie).

Class 4, which we titled 'Negative effects on daily life and practices', included extracts in which participants described the impacts of the pandemic on their daily life with words such as 'go out', 'house', and 'face mask'. Participants perceived that those impacts were sudden and caused problems for which they were not prepared. They mentioned that they were worried about their family and catching the disease, but also other types of concerns such as loneliness and mental distress. They perceived going out as dangerous and saw isolation as necessary but also as having negative effects. Here are some of the typical extracts:

> "We shouldn't go out without a face mask. People, so many people, go out without a face mask. Really, it's too much rebelliousness" (Melanie).
>
> "I won't go out for as long as needed" / "I don't see anyone. Only via telephone. Sometimes, my son does the grocery shopping, puts the things at the door. But I'm seeing that even my relationship with my husband is becoming different" (Margaret).
>
> "Having to be at home, as we are now, puts into question some things that you have internally, of which you were not quite aware" (Elton).
>
> "[I'm doing my best] not to go desperate, nervous, and depressive. There are people who become depressive when they have to stay at home all the time. Since I like reading [I'm coping]" (Julia).

Discussion of the First Moment of Data Collection

The theory of social representations provides a lens for interpreting these findings. New and relevant social objects, 'the coronavirus' and Covid-19, emerged in the reified universe (Moscovici, 2000), in this case, in the field of medicine. When these objects entered the domain of the consensual universe and common sense (Moscovici, 1961, 2000), they were transformed and reconstructed in such a way as to guide practices and reinforce social identities (Jodelet, 1999). Participants placed the responsibility for negative aspects of the

phenomenon on outgroups such as the Chinese and 'rebellious' citizens. The findings indicate that they constructed social representations through cognitive polyphasia (Moscovici, 1961), that is, they combined scientific information about 'the coronavirus' and Covid-19 with religious beliefs, traditional knowledge, and common sense.

To construct social representations, the participants used the processes of objectification and anchoring (Jodelet, 1999). Through objectification, they found images capable of materialising abstract notions: for example, eating wild animals as the origin of the virus, Covid-19 as an attack on the lungs, and the pandemic imagined as a war. Through anchoring, they constructed ways of understanding the new objects in the framework of previous systems of knowledge, mainly religious ones. They anchored the pandemic as an event of cosmological transformation caused by teleological, spiritual, and/or divine forces; a way of accelerating the moral evolution of humanity and/or punishing human beings for their evil, egoism, materialism, and disobedience. The social representations of Covid-19 included complex explanations, i.e., theories of common sense, characterised by causal duality (Moscovici, 2000): the participants combined efficient causes of the virus (e.g., genetic mutations for example) with cosmological causes (e.g., the need for moral reform of humankind or a warning about future tragedies). The social representations provided not only *explanations* but also *meanings* to what was happening.

We identified one class - Class 3 - which focused on ideas and images about an unknown, dangerous, and lethal virus. At this moment of data collection, the representational elements associated with uncertainty and fear were particularly strong. To cope with the new objects, perceived as threatening, the participants constructed social representations characterised by the *othering process*. This process, sometimes subtle and not completely conscious, is typical of social representations of infectious diseases and provides symbolic barriers to coping with the threat (Eicher & Bangerter, 2015). Through othering, the disease, its causes, and circulation are represented as the 'property and blame of others' in ideas such as, 'the Chinese are responsible for the coronavirus', 'the virus circulates because of irresponsible and disobedient people, who are also its preferential victims'. In the same vein, the belief that 'the pandemic is a moral reform process or a warning' might have been accompanied by the underlying belief that 'I (the participant) and my ingroup are aware of the moral principles involved and already act accordingly', with the possible underlying consequence, 'the pandemic will only hit others'. The social representations provided

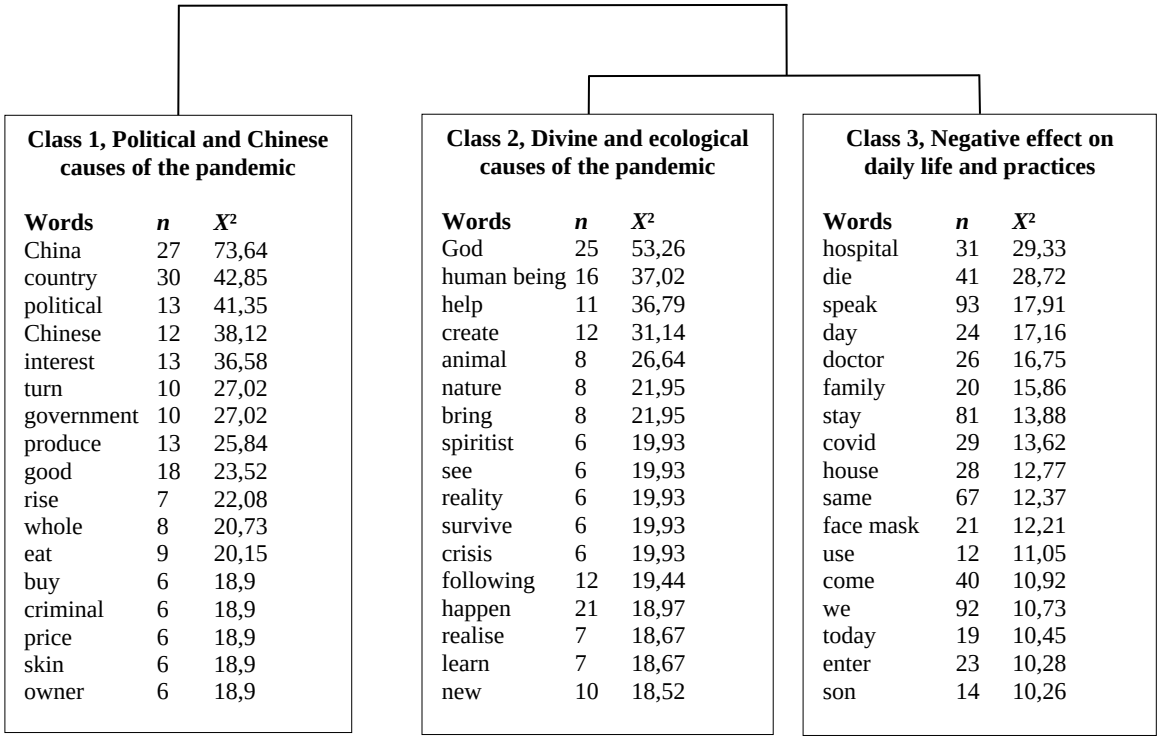
symbolic protection against the disease (as in the case analysed by Jodelet, 1989) and helped the participants cope with a high level of anxiety.

Six Months after the First Interviews

We conducted a second round of interviews with the participants in September 2020, based on the same semi-structured interview schedule. At this moment in Brazil, the 'first wave' of Covid-19-related infections and deaths showed a downward trajectory. The 'first wave' reached its peak in mid-July 2020, with around 33,000 deaths per month. In mid-September, the monthly death toll was around 22,000 (G1, 2020). The Brazilian lockdowns were disorganised and did not follow a national strategy; the more drastic modifications in the daily life of Brazilians did not last long and in May 2020 (before the peak of the 'first wave'), there were already signs that only around 40% of the population were respecting the lockdown (Magenta, 2020). These factors impacted the discourse of the participants at this moment of data collection. Elton, for example, stated that the circulation of people in the streets was 'practically normal' and that he had recently seen a 'street party'. We submitted the interviews to the TDHC and the findings are shown in Figure 2.

Figure 2.

Second Moment of Data Collection (September 2020). Top-Down Hierarchical Classification of the Participants' Interviews. Frequency and association (chi-square) of typical words in each one of the generated classes of segments of text.



Class 1, Political and Chinese causes of the pandemic

Words	***n***	***X*²**
China	27	73,64
country	30	42,85
political	13	41,35
Chinese	12	38,12
interest	13	36,58
turn	10	27,02
government	10	27,02
produce	13	25,84
good	18	23,52
rise	7	22,08
whole	8	20,73
eat	9	20,15
buy	6	18,9
criminal	6	18,9
price	6	18,9
skin	6	18,9
owner	6	18,9

Class 2, Divine and ecological causes of the pandemic

Words	***n***	***X*²**
God	25	53,26
human being	16	37,02
help	11	36,79
create	12	31,14
animal	8	26,64
nature	8	21,95
bring	8	21,95
spiritist	6	19,93
see	6	19,93
reality	6	19,93
survive	6	19,93
crisis	6	19,93
following	12	19,44
happen	21	18,97
realise	7	18,67
learn	7	18,67
new	10	18,52

Class 3, Negative effect on daily life and practices

Words	***n***	***X*²**
hospital	31	29,33
die	41	28,72
speak	93	17,91
day	24	17,16
doctor	26	16,75
family	20	15,86
stay	81	13,88
covid	29	13,62
house	28	12,77
same	67	12,37
face mask	21	12,21
use	12	11,05
come	40	10,92
we	92	10,73
today	19	10,45
enter	23	10,28
son	14	10,26

Note: the titles of the classes were created by the researchers based on their dominant content.

The TDHC resulted in 3 classes that we named according to their dominant content as follows: (1) Political and Chinese causes of the pandemic; (2) Divine and ecological causes of the pandemic; and (3) Negative effects on daily life and practices. The first class gathered statements about the origin of the virus in China and its association with political interests, with words such as 'China', 'political', 'interest', and 'government' as typical words. The participants had negative attitudes towards China. Some of them mentioned the possibility that the Chinese had deliberately created the virus with the intention, for example, to raise their worldwide political and economic influence. The participants acknowledged that they were unsure about the origin of the virus and identified once more the Chinese eating habits as a probable cause. The following extracts are illustrative of these ideas:

> "[the origin of the virus] is still unknown [...] In the United States, they are blaming China" (Clara).

> "I don't know if it is in China or another communist country [...] the Chinese eating practices... they eat everything, they eat rats, cockroaches, they eat all of those things. People said it was from this [that the virus emerged]" (Julia).
>
> "[the Chinese] producing something that could be harmful in their laboratories, I don't doubt it, I think it is very likely" / "they [the Chinese] want to dominate the world. They don't care. It is as if it [the pandemic] were a small price to pay. The loss of some lives would not matter in relation to the bigger aim" (Margaret).

As in the first dendrogram, we named Class 2 'Divine and ecological causes of the pandemic'. Typical words in this Class were, for example, 'God', 'human being', and 'nature'. This Class included the ideas that human beings are immoral, irresponsible, egoists and destroy everything that was created by God (e.g., nature); and that God is a good and consoling educator, having allowed the occurrence of the pandemic to promote the reconnection of human beings with moral values. Here are some typical extracts:

> "Therefore, in my opinion, the virus is godly [...] if we consider carefully what would be the best option to correct humanity" / "I think [the pandemic] is this, a tidying up break. But believing that everything will be gorgeous and wonderful after [the pandemic] is silly" (Elton).
>
> "People are only concerned with their material evolution. God has been giving opportunities, showing [the right way], and people don't care. I think [the causes] are all the aggression that we [human beings] did against nature and our egoism" / "God is allowing that something so unknown, a virus so insignificant, cause all of this [the pandemic-related harm] to see if, through pain, people wake up. However, it is still little" (Margaret).
>
> "God made everything so perfect, but human beings come and destroy everything. You see now what is happening to these forests burning, what a sad thing killing the little animals" / "human beings [...] went against our God. God is sad with it [...] Maybe, the pandemic is a little slap on the wrist" (Melanie).

We named Class 3 also in accordance with the first dendrogram, 'Negative effects on daily life and practices'. Typical words were, for example, 'hospital', 'stay', 'house', and 'face mask'. Here, the participants talked about Covid-19 symptoms, contamination factors, long-term consequences, vulnerable groups, treatments, hospitalisation, death risk, and preventive measures. They described Covid-19 cases and related deaths among people they knew personally. They characterised themselves as respectful of the norms and advice for preventing Covid-19 whilst feeling insecure because of the irresponsibility of others. In their representations, 'other people' were reckless, did not use face masks, did not respect physical distancing, or the lockdown rules, and were responsible for the worsening of the pandemic. The following extracts are representative of these ideas:

> "[a lady] did not respect physical distancing, posted [on social media] that she was in a crowd, and now she's in hospital. She has Covid and is not well, she's in intensive care using a tube" (Clara).
>
> "I lost a friend in less than 15 days. He left us because he had pulmonary emphysema" (Elton).
>
> "As long as there is no vaccine [cure or medication], we will live in this isolation, especially the groups at risk like us, for example, the elderly or [people with some] comorbidity" (Hugo).
>
> "I give advice to people who are at home [...], becoming depressed: listen to music, try to write something" (Julia).
>
> "My friend's mum died yesterday, was buried yesterday. I couldn't even go to the funeral because I was here working, and it was a closed coffin" (Lucas).
>
> "I don't know how many thousand people died and this is very sad. [...] We have to believe that it is indeed because of disobedience" (Melanie).

Discussion of the Second Moment of Data Collection

The social representations constructed by the participants in this second moment (September 2020) were in some ways similar to the representations they constructed in the first moment. One such similarity is the process of othering (Eicher & Bangerter, 2015). The participants stated once again that outgroups (the Chinese, 'materialist' or 'disobedient' people, etc.) were responsible for the origin and circulation of Covid-19. They used the dichotomies responsible/irresponsible, respectful/disrespectful, and spiritualist/materialist to characterise the ingroup and the outgroups, respectively. At this moment, two participants (Clara and Lucas) declared they had Covid-19. However, they attributed responsibility for their infection to others. The social representations of Covid-19 performed an identity-protective function (Joffe, 2013), promoting a positive image of the self and ingroup. Another similarity is the anchoring of the social representations of Covid-19 to religious beliefs. Participants perceived the pandemic as an event that God promoted or allowed to teach lessons and limit human irresponsibility and destructiveness.

However, there were also important differences in relation to the first interviews. Although religious and teleological explanations persisted, the participants no longer represented the pandemic as an event leading to a total transformation of the planet and humanity. In the analysis of the second interviews, the analysis did not identify a class equivalent to first-interviews-Class-1 (which referred to the 'cosmological causes').

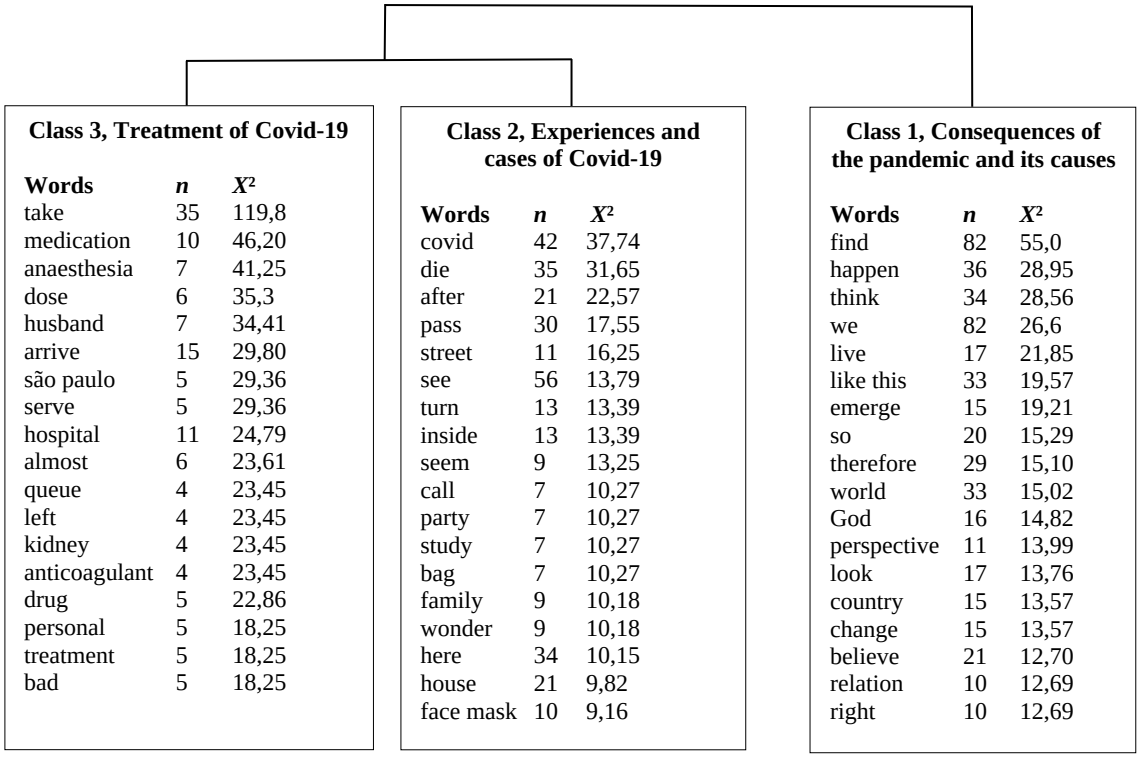
Participants stated that “believing that everything will be gorgeous and wonderful after [the pandemic] is silly” (Elton) and that “[the pandemic-related harm] [...] is still little [to promote meaningful transformations]” (Margaret). The word ‘coronavirus’ was less important here than in the first interviews: there was no class equivalent to first-interviews-Class-3 (which referred to the ‘very dangerous virus’).

Fourteen Months after the First Interviews

We conducted a third and last round of interviews with the participants in May and June 2021. At that time, Brazil was in the middle of a ‘second wave’ of SARS-CoV-2 infections and deaths caused by Covid-19 (World Health Organisation, 2022). The death toll was around 2,000 people a day in the country (G1, 2021). The vaccination campaign against Covid-19 had started in January 2021. At the end of June 2021, around 74 million Brazilian residents had received at least one dose of an available vaccine, corresponding to 34% of the population (G1, 2022). At this moment of data collection, all participants had received at least a first dose of vaccine. The TDHC analysis of the interviews from this moment produced three classes, as shown in Figure 3.

Figure 3.

Third Moment of Data Collection (May-June 2021). Top-Down Hierarchical Classification of the Participants' Interviews. Frequency and association (chi-square) of typical words in each one of the generated classes of segments of text.



Class 3, Treatment of Covid-19

Words	***n***	***X*²**
take	35	119,8
medication	10	46,20
anaesthesia	7	41,25
dose	6	35,3
husband	7	34,41
arrive	15	29,80
são paulo	5	29,36
serve	5	29,36
hospital	11	24,79
almost	6	23,61
queue	4	23,45
left	4	23,45
kidney	4	23,45
anticoagulant	4	23,45
drug	5	22,86
personal	5	18,25
treatment	5	18,25
bad	5	18,25

Class 2, Experiences and cases of Covid-19

Words	***n***	***X*²**
covid	42	37,74
die	35	31,65
after	21	22,57
pass	30	17,55
street	11	16,25
see	56	13,79
turn	13	13,39
inside	13	13,39
seem	9	13,25
call	7	10,27
party	7	10,27
study	7	10,27
bag	7	10,27
family	9	10,18
wonder	9	10,18
here	34	10,15
house	21	9,82
face mask	10	9,16

Class 1, Consequences of the pandemic and its causes

Words	***n***	***X*²**
find	82	55,0
happen	36	28,95
think	34	28,56
we	82	26,6
live	17	21,85
like this	33	19,57
emerge	15	19,21
so	20	15,29
therefore	29	15,10
world	33	15,02
God	16	14,82
perspective	11	13,99
look	17	13,76
country	15	13,57
change	15	13,57
believe	21	12,70
relation	10	12,69
right	10	12,69

Note: the titles of the classes were created by the researchers based on their dominant content.

We named these classes as follows: (1) Consequences of the pandemic and its causes; (2) Experiences and cases of Covid-19; and (3) Treatment of Covid-19. Class 1 mainly gathered the participants' statements about the negative consequences of the pandemic on public health and the economy in Brazil and worldwide. The (typical) words 'find', 'happen', and 'think' indicate the descriptive and evaluative character of these statements. Participants talked about the suffering, deaths, economic damage, and unemployment caused by the pandemic. They believed that the vaccines would help contain the pandemic, but the damage would not cease soon. They lamented that many people were still denying the seriousness of the pandemic and the importance of preventive measures. The following extracts are illustrative of these ideas:

> "[despite the vaccination], the world is still suffering [...] because the cases and deaths keep happening" / "it ended up harming the economy, there are a lot of people unemployed" (Clara).
>
> "everybody is going out, going to the shopping centre, forming crowds... everybody is going to the beach facing packed public transportation. It's inevitable, this will create another wave [of infections] and the vaccination done up till now won't hold" (Hugo).
>
> "it is horrible. I think that people were terrorised. We don't know what the future holds. Everyone is very insecure" (Julia).
>
> "I thought that with the vaccination... everyone would get their vaccine and it's finished, done, the virus is finished, there is no more. [...] I changed my belief because it won't finish" (Margaret).

Another aspect of Class 1 refers to the causes of the pandemic. Margaret, for example, mentioned the harm that human beings caused to the 'ecology' and the idea that the pandemic would serve as a correction to humanity, "a slap on the wrist that we, human beings, are receiving". Elton characterised the pandemic as an "awakening that would happen in the future and ended up happening now", and added, "I think that the coronavirus started a series of things, such as in the area of technology". They stated that the pandemic was bringing some benefits but no longer expressed the idea that the pandemic was some kind of 'planetary revolution'.

Class 2, 'Experiences and cases of Covid-19', included descriptions of negative experiences lived by the participants, their family, and friends, alongside statements about the number of deaths and their circumstances. This Class included the words 'Covid', 'die', 'street', and 'party' as typical words. For the first time, the word "Covid" was a class-specific word. Participants expressed their fear of the disease, their belief in its seriousness, possible long-term consequences, associated sadness and emotional instability, and cases of people who had the disease. The following extracts were typical of this Class:

> "one thing is the theory and another is the experience [of the disease]. [...] I am very optimistic. So, when I got Covid, I thought it would be nothing [but I had a frightening high fever]" (Elton).
>
> "I don't even watch television anymore, you know, when it starts talking about Covid... disease... I change the channel because I can't stand anymore seeing those ditches with black plastic bags [bodies]" (Julia).
>
> "Sometimes, I feel panic [panic crisis]. These are post-Covid symptoms [...] I had a real muscular loss" (Lucas).
>
> "on the following day, his friends called him and said 'we got Covid'. There you go. The next day, he went for a test" (Margaret).

Class 3, ‘Treatment of Covid-19’, included extracts in which participants described aspects of hospital treatment, prevention, vaccination, and their disbelief regarding the efficacy of some medications. ‘Take’, ‘medication’, ‘anaesthesia’, and ‘dose’ were typical words. The following extracts typify this class:

> “I didn’t expect this degree of severity of the second wave [of infections] to the point of [hospitals] lacking medication and oxygen. It is a totally highly serious situation” (Hugo).
>
> “a doctor [...] wanted me to take chloroquine, azithromycin, ivermectin. I said ‘I will not take it’. I will not take medication [supposed to be prescribed] to kill parasites” (Lucas).
>
> “what really shocked me was when my grandson was ill, very ill in the hospital and [...] we hired a doctor from Sao Paulo to see him online” (Margaret).

Discussion of the Third Moment of Data Collection

In the third interviews, the participants described the pandemic as a crisis causing suffering, deaths, and economic collapse and Covid-19 in part as a personal experience. In this context, in which the ingroup (e.g., family and friends) and the self had been directly touched by the disease, the idea that the pandemic would bring positive consequences (prevalent in the first interviews, especially in its Class 1) was fainter and more at odds with the social identity function of the representations (Joffe, 2013). The participants continued to sustain a positive self-image characterising themselves as responsible and others as irresponsible regarding preventive measures.

The participants provided more precise details of Covid-19 as a specific disease that caused specific symptoms. The TDHC analysis of the first and second interviews identified classes of segments of text centred on the spiritual or divine causality of the pandemic, which did not happen in the analysis of the third interviews. In the third interviews, the idea of a divine or spiritual causality was mentioned but only as a secondary aspect of one of the classes. Religious beliefs continued to provide a set of meanings for the anchoring of Covid-19, but they increasingly shared space with science-based beliefs.

Frequency of Selected Words

The analysis of the frequency of some selected words reinforce the interpretations made above. Table 2 shows the frequency of words that were especially relevant in the

participants' explanations of the pandemic in the three moments of data collection. These were purposefully selected because they help illustrate the main analysis presented here, i.e., the transition of the social representations of Covid-19 from cosmological-religious to more technical-scientific explanations[1].

Table 2.

Frequency of words that were especially relevant in the participants' explanations of the pandemic in the three moments of data collection. Words decreasing and increasing in frequency.

	Words	**1st interviews *n***	**2nd interviews *n***	**3rd interviews *n***	**% difference between 1st and 3rd**
Words decreasing in frequency	virus	70	63	36	- 49%
	coronavirus	40	22	09	- 77%
	flu	14	14	03	- 79%
	God	53	33	18	- 66%
	China	31	42	06	- 81%
	fear	21	17	06	- 71%
	doubt	08	02	00	- 100%
Words increasing in frequency	Covid	4	35	52	+ 1,200%
	vaccine	13	00	34	+ 161%
	science	12	00	34	+ 183%

Words such as 'coronavirus', 'God', 'fear' and 'doubt', associated with the supernatural explanations of the pandemic, presented higher frequency in the first interviews and lower frequency in the following moments of data collection. The higher frequency of the words 'coronavirus' and 'China' in the first interviews were associated with the perception of the virus as a particularly world-altering new object. Words such as 'Covid', 'science', and 'vaccine', associated with scientific explanations, had increased frequency in the third moment of data collection. Perceiving 'Covid' as a specific disease, independently of its anchoring as a 'flu' (a word whose frequency decreased), required more precise scientific information and closer experiences with the disease.

[1] Other terms, such as war, hospital, doctor, and others, could have been selected for the same purpose. Our intention here was not to be exhaustive but to choose a reduced set of words that can be sufficiently illustrative of the analysed change in the social representations throughout the considered period. This analysis of frequencies of words intends to be complementary rather than a primary one.

GENERAL DISCUSSION

This study found that, at the beginning of the Covid-19 pandemic, the participants applied their beliefs (mainly religious beliefs) about 'broad' objects, society and humanity, to anchor and explain the pandemic. Their new social-symbolic reality explanations became less prominent with time, as we verified in the interviews conducted six and fourteen months after the first moment of data collection. The theory of social representations provides conceptual tools to interpret these transformations, especially regarding the relationships between social representations and social practices.

Social representations are the psychosocial 'cement' uniting social groups and communities and, as such, are characterised by stability and resistance to change (Moscovici, 2000). However, individuals and groups are constantly engaged in the process of constructing-reinforcing and reconstructing-modifying their social representations, i.e., their social realities (Abric, 1994; Moscovici, 1976). Substantial modifications in social practices and the symbolic-material environment, such as the lockdown experiences during the pandemic, transform social representations (Rouquette, 2000). If these modifications in practices (in this case, the lockdown, face masks, physical distancing, online working, etc.) are perceived as reversible, the transformation of the social representations tends to be temporary, but if they are perceived as irreversible, the social representations tend to be substantially or radically transformed (Flament, 1994).

At the beginning of the pandemic and lockdown, the participants perceived the modifications in social practices and the social environment as irreversible. They characterised these modifications as a profound change in the relationship of individuals to God, society, and/or the planet. The perception of irreversibility led to the transformation of their beliefs about an infectious disease with the anchoring of Covid-19 not only as a 'disease', but also as a 'cosmological breakthrough', i.e., a religious and/or existential watershed moment for humanity. However, in the second and third interviews, the participants highlighted the reversibility of the perceived social modifications. The social reality was perceived as 'the same' again, with people going back to in-person work or circulating in the streets, traffic jams, parties, and social events. The transformations of their social representations concerning infectious diseases, Covid-19, society, and humanity were short-lived and Covid-19 went from a 'cosmological breakthrough' to a 'normalised disease'.

We verified that the range of the categories of knowledge mobilised to explain Covid-19 varied. This range refers to the breadth of the 'areas of reality' that the categories aim to describe and explain. It was large at the beginning of the pandemic when Covid-19 was categorised as an event of cosmological transformation. At this moment, the social representations of Covid-19 included explanations about general and encompassing cosmological elements such as humanity, God, society, and the environment. Later on, this type of explanation lost prominence and Covid-19 was anchored as a ('normalised') infectious disease, a category that describes and explains a more restricted range of phenomena[2].

We may term this range the 'anchoring scope' of the social representation. The process of normalisation of Covid-19 was characterised by an interesting paradox: the 'anchoring scope' of the social representations of Covid-19 was reduced precisely when the virus and pandemic were becoming more objectively dangerous. At the beginning of the pandemic, there were few infections, hospitalisations, and deaths, and 'the coronavirus' was perceived by the participants as the agent of a large-scale transformation of humanity. After a few months, when there were millions of confirmed cases and thousands of deaths, the social representations of Covid-19 did not include the large-scale transformation beliefs anymore. That is, what determined the 'broad' character or 'anchoring scope' of the social representations of Covid-19 was not the objective knowledge (reified universe – Moscovici, 2000) about the number of hospitalisations and deaths but instead the suspension of 'normal daily life' (consensual universe – Moscovici, 2000) provoked by measures such as the lockdown. The key explaining factor here may be the modification in social practices.

Considering a possible theoretical contribution, this study suggests the concept of 'anchoring scope', which refers to the range of the categories of knowledge mobilised to explain a new object. This study suggests the hypothesis of a positive correlation between the extent to which social practices are changed and the anchoring scope of a social representation. Anchoring is a socio-cognitive process through which individuals and groups classify an object into familiar categories and representations, i.e., into a 'worldview'. As Moscovici (2000) stated, through anchoring "we reveal our 'theory' of society and of human nature" (p. 43). A social-psychological analysis of any social representation can unveil at least part of the worldview in which the represented object is anchored, revealing the links

[2] We are not proposing that these categories differ in quantitative terms (the number of exemplars that they may contain) but in qualitative terms (the 'area of reality' they refer to – their meanings).

of the concerned individuals to society and culture. The concept of 'anchoring scope' advanced here does not refer to this type of social-psychological analysis (in which the anchoring range tends to be, by definition, all-encompassing) but to the consensual universe as perceived by the 'lay' individual. When modifications in social practices are perceived as substantial (as was the case with the first Covid-19 lockdowns), individuals will employ a wide anchoring scope to represent the concerned object.

Another interesting characteristic of how the participants' social representations of Covid-19 evolved refers to the process of othering. The participants attributed the responsibility for the virus and the pandemic to others, such as the Chinese and people they considered 'irresponsible' or 'rebellious'. The process of othering contributes to the management of the anxiety related to the new object, the symbolic integrity of the ingroup, and identity protection (Eicher & Bangerter, 2015; Joffe, 2013). When the participants themselves or their close family and friends had Covid-19, the participants blamed others for the infection: others were not taking the pandemic seriously and did not adopt adequate hygiene habits and preventive measures. That is, during the considered period, the social representations changed but there was continuity in the 'othering process' (Eicher & Bangerter, 2015).

In this study, across the three moments of data collection, the participants tended to blame individuals (that they characterised as 'irresponsible' or 'rebellious') for the spread of the coronavirus and related suffering and deaths. This type of explanation has ideological implications since it contributes to the concealment of the societal determinants of infections and mortality (Preston & Firth, 2020; Souza et al., 2021). In accordance with the identity function of social representations (Jodelet, 1999), the participants' social representations of Covid-19 avoided challenging the social position and relative privileges that characterise the Brazilian middle classes.

During the pandemic, individual and collective actors produced the ideological discourse that Covid-19 was a 'democratic disease' evenly hitting all social groups (Matta et al., 2021). However, a critical analysis reveals that the pandemic made explicit and reinforced various types of social, economic, and political inequalities, such as racial and class inequalities (Matta et al., 2021; Oliveira et al., 2020; Preston & Firth, 2020). Preventive measures such as physical distancing via online work or even hand washing were not an equally distributed possibility to all individuals. In Brazil, access to these measures is particularly difficult for underserved communities, with members of the Black population in

their majority (hence, a racial issue involving historical and structural racism), inhabitants of vulnerable neighbourhoods, deprived of basic sanitation and dependent on public transportation (Oliveira et al., 2020). The pandemic affected with greater severity the working classes and marginalised groups such as informal workers, the Black and Indigenous populations, and women (Komatsu & Menezes-Filho, 2020). The social representations of Covid-19 constructed by middle and upper-middle-class individuals may have contributed to the concealment of these historical and structural inequalities, thus having ideological implications (Souza et al., 2021) and may have had large circulation on social media. Social representations participate in processes of social discrimination (Jodelet, 1989). It is important to reveal their ideological implications since social representations may also resist and challenge structures of domination (Howarth et al., 2014; see Gravante and Poma, 2022, for an interesting analysis based on the sociology of emotions).

This study has an important limitation, the low number of participants. A higher number of participants might have enriched the analysis and showed important counter-examples. It is likely that for many other individuals and social groups, the construction of the social representations of Covid-19 did not follow the same patterns suggested here. However, considering the analysed relationships between social representations and social practices, the patterns identified in this study are likely to have been widespread. This study is further justified by its longitudinal character since this type of design is scarce in investigations of social representations. Another limitation of the study, probably stemming from the low number of participants, is the restriction of the TDHC to the identification of classes (dominant patterns of meaning) rather than socio-subjective positions of enunciation[3] (Kronberger & Wagner, 2000; Souza, 2020). Future longitudinal studies with similar designs could include more participants, from more diverse backgrounds (including, e.g., class, race, or political orientation), and use TDHC to identify not only dominant patterns of meaning but also positions of enunciation and associations of these patterns with independent variables.

[3] Socio-subjective positions of enunciation are cognitive, behavioural, and emotional patterns that an individual or group adopts when they speak. They may speak, for example, based on their daily experiences or based on reified (scientific, legal, etc.) knowledge. Group belonging may be an important aspect of these positions, as one may speak ‘as a doctor’, for example, or ‘as a parent’, etc.

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