

## **Social Representations of Covid-19 in the Framework of Risk Psychology**

ROBERTO FASANELLI<sup>1</sup>, ALFONSO PISCITELLI<sup>2</sup> and IDA GALLI<sup>1</sup>

<sup>1</sup>Department of Social Sciences – University of Naples “Federico II”

<sup>2</sup>Departement of Agricultural Sciences – University of Naples “Federico II”

Social representations theory offers a useful framework to analyse the construction of lay explanations of social risks. The current study used this theoretical framework to investigate lay explanations of the COVID-19 outbreak. Risk psychology generally focuses on individual perceptions and cognitive errors or the notion of the fallibility of human information processing. According to Moscovici, society is not a source of information, but of meanings. People, on topics of interest, construct questions and look for answers, rather than merely perceiving and processing obtained information. Social psychologists, therefore, cannot be interested in risk responses as erroneous or correct, nor as false, deficient, or biased. Instead, they must be concerned with how social awareness of risk is built, in other words, how and why people need to co-construct social representations of such a risk. To identify the structure and content of COVID-19 SRs, we used a non-probabilistic sample composed by social sciences and humanities and life sciences students (N = 124). To access the structure of COVID-19 SRs, we employed the method of hierarchical evocation. The free association task was completed by participants' justification of their association choices to avoid the lexical ambiguity that could come from this kind of data. To access the content of COVID-19 SRs, we utilized both open and closed questions made up starting from the following dimensions: informative sources and participants' networks of interaction; anchoring and objectivation processes; expectations and emotions related to the object.

**Keywords:** social representations; COVID-19; risk psychology; mixed methods

This paper is inscribed in the strand of studies of the social psychology of risk, inspired by the social constructivist paradigm, and takes as its foundation the point of view of ordinary people about the probability that a risky event could cause damage to their own and others' health. The line of investigation adopted underlines the social and collective nature of people's knowledge of themselves and their world, focusing on shared conceptions, the way they develop, circulate and change (Jodelet, 2006). In this type of analysis, authors generally pay attention only to the ways of thinking, feeling and communicating of laypeople, which are not mistake-makers, i.e., they are not strategic users of schemes or heuristics that distort perception, nor to a subject capable of using only naive thought or unscientific thought. In the chosen psychosocial perspective, rather, the subject is seen as a user of a different logic, *sui generis*, which does not reference the abstract categories of true/false but which operates in a "natural", "consensual", or "other" than the scientific one, "reified".

This study aimed to explore the coronavirus pandemic (COVID-19) social representations, which, from January 2020 to date, has overwhelmed Italy and the rest of the world. The outbreak forced populations, social, health and economic systems into a total lockdown, as never experienced before.

The disciplinary field within which we performed the research described below is that of risk psychology/risk perception, traditionally focused on individual perceptions and cognitive errors, or centered on the notion of the fallibility of human information processing. In general, we can define risk as the likelihood of experiencing harm that involves both the nature of an option and the probability of its consequences (Ayres, França Júnior, Calazans & Saletti Filho, 2003). Psychology has been broadly involved with the analysis of the individual/social connection to risks, defining the development of so-called risk psychology (Breakwell, 2014). This field of psychology takes its origin from the principles of decision theory, based on theories of probability and mathematical calculations. In this framework, taking a risk depends on choosing between different options with the same probability of success or failure. The effort of the discipline is to understand psychological mechanisms at the base of the interaction between individuals and risks in the ambiguous and diffuse condition of uncertainty (Marván & López-Vázquez, 2018). Since its inception, risk psychology, has sought to identify the underlying dimensions that explain the organization of

the characteristics attributed to risk. The primary argument was that any hazard could be located in a two-dimensional matrix, one dimension reflecting the degree of fear and controllability of the hazard and the other reflecting the degree of uncertainty associated with the properties of the hazard. From this original trajectory, various patterns were developed. The models that describe how people judge uncertain events claim that when faced with uncertainty in results, intuitive inferences, predictions, evaluations and diagnoses of likelihood, people do not conform to the laws of probability theory. An approach focused on decision making in the absence of certainty about its implications plays an essential role in the understanding of economic behavior. Research in this area has shown that judgments tend to reveal consistent biases that some heuristics can partly predict (Kahneman, 2011). Experimental research data mostly characterized this set of models. Within this range of studies, the Optimistic Bias (OB) approach occupies a privileged position, central in several socio-cognitive models that aim at predicting risk-taking factors, such as the Health Belief Model (Rosenstock, 1974), the Protection Motivation Theory (Rogers, 1975) and the Health Action Process Approach (Schwartz, 1992).

Further models describe how people characterize the attributes of hazards or explore how people estimate the extent of harm that a hazard can cause and the probability that such harm will occur. In this case, the estimation of the perceived risk determines the focus (Slovic, 2000). The third group of models aims to explain how one person may differ from another in the perception of specific risk and the response to that risk. These studies aimed to identify personal factors that can be influential in determining an individual's reaction to risk. Authors considered socio-demographic criteria as significant predictors. Great attention has been paid to the links between risk perception and personality using the "Big Five" factors proposed by Zuckerman (2005). The fourth group of models develops on the growing awareness that emotions or feelings play a significant role in explaining how people react to risks. Equally important is the conceptual framework used to describe how communication within complex networks of people and institutions serve to amplify or mitigate the risk associated with a hazard. This model is known as the Social Amplification of Risk Framework (SARF).

Moreover, interaction, also channeled by the mass media, has transformed novelty into something that can be understood and incorporated into something already known and interpreted. These processes of symbolic social interaction are complex and are the object of investigation in Social Representations Theory's research. Social Representations Theory

researchers have frequently become interested in how new dangers and risks are understood by ordinary people, giving rise to the last of the clusters of approaches identified by Glynis Breackwell (2014) in her crucial book on risk psychology.

The importance of the Social Representations Theory approach to the study of risks lies in Moscovici's (1989) conviction that society cannot be simplistically reduced to a source of information but must be considered as a source of meaning. On issues of their interest, people construct questions and search for answers, rather than merely perceiving and processing information derived from the social context (Moscovici, 1984). Social psychology, therefore, cannot concern itself with how much a response to a risk is wrong or correct, whether it is true or false, but must deal with how ordinary people construct social knowledge of risk, in other words, how they represent it (Fasanelli & Galli, 2009). As underlined by Smith, O'Connor, and Joffe (2015, p. 1.3), "Risks, or the potential dangers that sit on the horizon of people's awareness, need to be assimilated, taken in, by the individuals and communities confronted with them".

The Social Representations Theory may be uniquely appropriate in explaining why particular perceptions or reasoning patterns of risks emerge. Ordinary people commonly develop these forms of knowledge to explain what occurs when they are obliged to make sense, or give meaning, to ideas or data that are unusual to them, under conditions of uncertainty or social dispute. These are attributes that delineate the initial interface between people and information about risks. Indeed, according to Breakwell (2014, p. 284) "it may be argued that encountering a newly identified hazard inevitably triggers social representations processes".

Starting from these considerations and adopting the theoretical perspective of social representations, we investigated to verify the existence of differences between the social representations of COVID-19 elaborated by university students belonging both to the area of social sciences and humanities and to that of life sciences.

## **METHODOLOGY**

According to Abric (2003), all representations, being organized sets, have two components, a content and a structure. To study a social representation in this perspective, means, first of all, to trace the constituent elements of this structure. Knowledge of the content alone is not enough; it is the organization of this content that gives meaning to the whole representation. Two identical contents can correspond to two different symbolic universes and, consequently,

subtend two distinct social representations (Fasanelli, Galli, Rivero & Piscitelli, 2020; Galli & Fasanelli, 1995, 2000, 2020; Galli, Liguori, Lorenzi-Cioldi & Fasanelli, 2019; Tuselli, Schember, Fasanelli & Galli, 2015). For this reason, we hypothesized the existence of two different representations of COVID-19 in two distinct groups of participants composed of university students at the University of Naples "Federico II". Specifically, the first group included students from the department of social sciences and the department of humanities (n = 63; mean age = 22.9; Mdn = 23.0; Mo = 19.0; SD = 3.7). The second group consist of students attending various departments: molecular medicine and medical biotechnologies; public health; clinical medicine and surgery (n = 61; average age = 22.5; Mdn = 23.00; Mo = 24.00; SD = 2.73).

The choice of this sampling strategy of opposing students from different scientific areas was based on the assumption that, as a result of their academic membership, different groups may exhibit different degrees of proximity to the object, COVID-19. Different technical choices in enrollment in courses in the University of Naples also means different social and environmental contexts of academic life. These students are physically distant. Social sciences and humanities occupy several ancient buildings in the historic center, while the life sciences are located within modern facilities situated inside a circumscribed and fenced-in area (the polyclinic park) located on the northern outskirts of the city. Miguel, Valentim, and Carugati (2012) showed how the closeness to the object modulates the content of representations. People who have some scientific/technical knowledge about an object probably feel more involved with it and change more practices related to it. Knowledge is a complex variable because it continuously evolves in parallel with the time passing. For example, each subject can modify or change his/her own level of knowledge about COVID-19 by learning information about contagion processes or illness characteristics, by changing or evolving his/her lifestyle and by adapting his/her habits to his/her social relations or new life conditions (Dany, Apostolidis & Harabi, 2014). Mouret, Lo Monaco, Urdapilleta, and Parr (2013) emphasized that the degree of knowledge of a given object influences the level of competence about the object itself and, on the contrary, it influences the distance from the object. Conceptualized by Abric (2001) and then tested in an interesting study (Dany & Abric, 2007), that notion is constituted by 3 components (Dany et al., 2014): knowledge (more or less adequate identification of the social object); involvement (the degrees of concern, through social participation, toward the social object); and level of practice (behavior regarding the social object). For this exploratory study, we decided that it was sufficient to

use scientific areas, social sciences and humanities/life sciences as a simple dichotomous proxy variable for the distance from the object. Both groups of participants were convenience samples. Students were reached during online university classes and asked to fill out an online form at the end of the lesson. We collected data from the 20th to the 30th of May 2020. Participants provided their informed consent verbally, following The European Code of Conduct for Research Integrity (ALLEA, 2017).

### **Data Collection Strategies**

Within the methodological scenario characterized by the dualism quality-quantity, positions bearing different ontological, epistemological, and methodological assumptions, the pragmatist approach is a path that rejects the paradigmatic dichotomy and advocates the efficient and integrated use of both approaches. A sort of third paradigm, not yet able to solve all the metaphysical, epistemological and methodological issues, identifies a contingent approach based on the needs that guide "concepts and methods of research and not vice versa; an approach that unfolds in a methodological pluralism made of actions, needs, and research procedures appropriate to the reality studied". (Amaturo & Punziano, 2016, p. 67). Considering Social Representations Theory methodologically pluralistic by definition, we chose a mixed-methods approach to identify the structure and the content of COVID-19's social representations, using the structural approach (Abric, 1994, Flament, 1994; Vergès, 1994, 1995). To reach the structuring elements of the social representation of COVID-19 and to reconstruct their organization, we chose the method of hierarchical evocation (Abric, 2003; Vergès & Bastounis, 2001). In particular, we asked participants to answer a free association and hierarchical task, which has the double advantage of joining the frequency dimension of the terms and the importance given to them by the subjects. The intersection between these two criteria makes possible the identification of constituent, or significant elements. We completed the association/hierarchization task with open-ended questions about the respondent's justification linked to each of the associated terms. The aim was to avoid lexical ambiguity, misuse, *et similia*, typical of this kind of data (Galli, Fasanelli & Schember, 2017, 2018; Schember, Tuselli, Fasanelli & Galli, 2015). In the second part of the questionnaire, we asked participants to answer to both semi-structured and structured questions made up of the following dimensions: informative sources and participants interaction networks; anchoring and objectivation processes; expectations and emotions related to the object. According to Van Bavel, Baicker, Boggio, Capraro, Cichocka, Cikara et al. (2020, p. 461), "Emotions often

drive risk perceptions, sometimes more so than factual information. An emotional response to a risky situation can influence thinking". Beyond the medical risk, the pandemic has had enormous psychological and social impacts. Various lines of research had previously focused on understanding how societies define the origin and impact of epidemics and how they deal with them, with emotional coping as a key to the process (Idoiaga Mondragon, Gil de Montes & Valencia, 2017a; Ozamiz-Etxebarria, Dosil-Santamaria, Picaza-Gorrochategui & Idoiaga-Mondragon, 2020). For these reasons, we chose to ask interviewees about which emotions they feel thinking about COVID-19 using the Italian version of the Medical Emotion Scale (Duffy, Lajoie, Pekrun & Lachapelle, 2018; Amato, Fasanelli & Riverso, 2019).

### Data Analysis Strategies

We treated the terms evoked by the participants first with lexical and categorical analysis. In the lexical phase, we aggregated all lemmas based on the synonymy criterion to obtain clusters of terms substantially coincidental with the manifest meaning (Bardin, 2003). Therefore, using a semantic criterion, terms were further aggregated starting from their justifications. Each of the obtained clusters was associated with a new label. We identified every label using, as a selection criterion, the great semantic proximity and frequency of occurrence of every term aggregated inside of it. Three independent judges completed the entire analytical process. Each judge worked first individually; then, afterwards, all of them discussed their analysis and agreed on a shared position. We chose an inclusion threshold for the obtained categories, which allowed us to process only those that contained words provided by at least 5% of participants. In this way, we obtained 19 different categories for both groups of interviewees. For these categories, we calculated the Cognitive Saliency Index to identify elements with the best correlation between the frequency of apparition and the rank of importance (Table 1).

Table 1  
*Frequency, Importance Rank and Cognitive Saliency Index*

Structural elements	SH			LS		
	Freq	IR*	CSI**	Freq	IR*	CSI**
Anxiety	21	3.2	1.07	5	2.6	0.21
Change	5	2.6	0.21			
China	7	3.7	0.41			
Contagion	8	2.8	0.36			
Death	10	2.2	0.35	11	3.0	0.54

Family				5	3.2	0.26
Fear	20	2.8	0.89	12	2.8	0.55
Home				10	3.3	0.54
Isolation				5	3.0	0.25
Lockdown	6	2.8	0.27	6	2.7	0.27
Loneliness	5	3.0	0.24	6	2.8	0.28
Pandemic	12	2.4	0.46	22	2.6	0.94
PPE	15	3.5	0.83	12	3.9	0.77
Quarantine	22	3.8	1.33	20	3.7	1.21
Sadness	12	3.1	0.59			
Social distancing	10	2.2	0.35			
Study				5	3.4	0.28
Symptomatology				11	3.2	0.58
Virus	11	2.7	0.47	6	4.8	0.47

Note. \* Importance Rank

\*\* Cognitive Salience Index

The obtained data were then processed by the software IRaMuTeQ and treated with a similarity analysis, which enabled us to hypothesize the central core and the correspondent periphery configuration of the social representation of the COVID-19 disease, for each group of participants. The procedure consists of an elaborate matrix of similarity starting from the selected index, which depends on the nature of the relationship among the considered variables. In this case, we selected the Russel and Rao (1940) index, which is a distance measure (Chay, Lee, Lee et al., 2010; Hwang, Yang, Fitzgerald et al., 2001) used, in this study, because it excludes negative co-occurrences (Meyer, Garcia, Souza et al., 2004).

Answers to the open-ended questions were treated with categorical-frequency content analysis, using the "paper and pencil" method. Both the answers to the closed and scalar questions were processed by univariate statistical analysis to explore the distribution of the variables. The Chi-square statistical test was used to show significant connections between students' groups and the observed variables. The significance level for all variables was set *a priori* at  $p < =0.05$ . Emotions were investigated by using a classification tree. All statistical analyses were performed using IBM-SPSS 25 software.

## RESULTS

### Internal Structure

In the analysis of rank-frequency relationships, we chose not to use the traditional four-quadrant representation (see Abric, 2003) but to use a synthesis index of these two indicators,



which, in our opinion, offers a more reliable hierarchy of the knowledge associated with the object of analysis. From a general descriptive point of view, the data obtained through hierarchical evocations can be summarized as follows. Social sciences and humanities students associated 152 different words to the inductor. One hundred ten of these words, corresponding to 72.4% of the entire semantic universe, recorded a single frequency of appearance. Life sciences students, for their part, freely associated 140 different words, 92 (65.7%) of which were with a single frequency. We subjected these materials to lemmatization and, subsequently, to a semantic analysis using the justifications provided by each participant for each freely associated term. We also abolished all apices. Finally, we processed the results of this preliminary treatment using the Sutrop (2001) Cognitive Saliency Index (CSI), a procedure that returns a decreasing hierarchical classification of the terms shared by at least 5% of the respondents<sup>1</sup> in each subgroup (see Table 1). That index was calculated by the ratio of the following algorithm:  $CSI_j = F_j / (N \times A_{pj})$ . In the formula,  $F_j$  corresponds to the number of respondents who mentioned the item  $j$ ,  $N$  to the total number of respondents and  $A_{pj}$  the average rank of appearance of each  $j$ . It is also a useful index for the comparison between distinct surveys and, above all, independent from the length of the lists subjected to analysis, obtaining a definitive hierarchy of priority, useful for analytical decisions purified from the randomness that has always characterized traditional prototypical analysis.

Specifically, for students of social sciences and humanities, the constituent elements of the representation with the most significant cognitive saliency were *quarantine* (CSI 1.33), which for participant SH-F\_4<sup>2</sup> "was a preventive measure that had a big impact on my life". *Anxiety* (CSI 1.07) was associated by participant SH-F\_9 with "everything that was happening in our days in front of our eyes and not knowing how to get out and face this situation". *Fear* (CSI 0.89) was identified, as student SH-F\_23 says, because, "we are experiencing a situation that we have never experienced, and we do not know the remedy". Respondents assigned great importance to personal protective equipment (PPE) (CSI 0.83), as interviewee SH-F\_12 says, "I feel protected from the virus". Finally, social sciences and

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<sup>1</sup> In the studies conducted using the technique of hierarchical evocations, from the pioneering one of Grize, Verges, and Silem (1987) onwards, the minimum threshold of inclusion of terms to be treated with prototype analysis and similarities has always been two frequencies. In this study, it was decided to raise this threshold to the minimum sharing of 5% of the participants. That to reduce the cognemes included in the analytical outputs to those with a better level of sharing.

<sup>2</sup> Participants alphanumeric identifier: SH/LS = Social Sciences and Humanities/Life Sciences; F/M = respondents' gender; the number identifies the row in the dataset matrix.

humanities students experienced a strong sense of sadness (CSI 0.59) because, as SH-F\_28 says, they feel they are "losing a little piece of life". Furthermore, for life sciences students, the term that most identified cognitions related to COVID-19 was *quarantine* (CSI 1.21), which, as LS-M\_30 states, "It is a word that was not part of everyday life". Participants in this subgroup frequently associated the word *pandemic* (CSI 0.94) with the inductor. For example, LS-M\_6 justifies his choice by saying that "this virus has spread rapidly across several territories and continents, directly and indirectly involving the entire world population". "The mask has become everyday use for everyone, and you can no longer go out without it." (LS-F\_22) was one of the most frequent reasons for references to *PPE* (CSI 0.77) represented as needed and deserved by future doctors, in agreement with previous studies (Jaspal & Nerlich, 2016). Participant LS-M\_10's statement summarized the constant references to COVID-19 related symptomatology (CSI 0.58): "Most clinical cases manifest as interstitial pneumonia". In addition, for this subgroup the reference to *fear* (CSI 0.55) was very frequent, which was well summarized by subject LS-M\_3, who says, "I am afraid of being infected or infecting the people I deal with". Like many other medical students, interviewee LS-F\_43 talks about *death* (CSI 0.54) because "It has been a disturbing reality in the last two months to see all these deaths and not be able to do anything concrete". Finally, many medical students refer to their *home* (CSI 0.54) because, as interviewee LS-F\_4 says, "It is where I am living 24 hours a day".

The configurations presented in the following graphs (see Figures 1 and 2) were useful to identify the existing interrelationships between the constitutive elements of the structure of the social representation of COVID-19. In fact, as mentioned previously, it is the articulation of structural elements, not only the hierarchy, that gives meaning to the entire representation. To weigh the strength of the semantic link among each structural component of the representation, we chose the aforementioned RR (Russel and Rao, 1940) coefficient. A parenthesis containing the value assumed by the link it has with the other concepts of the cluster, expressed in terms of Russel and Rao coefficient, will follow each concept belonging to a cluster.

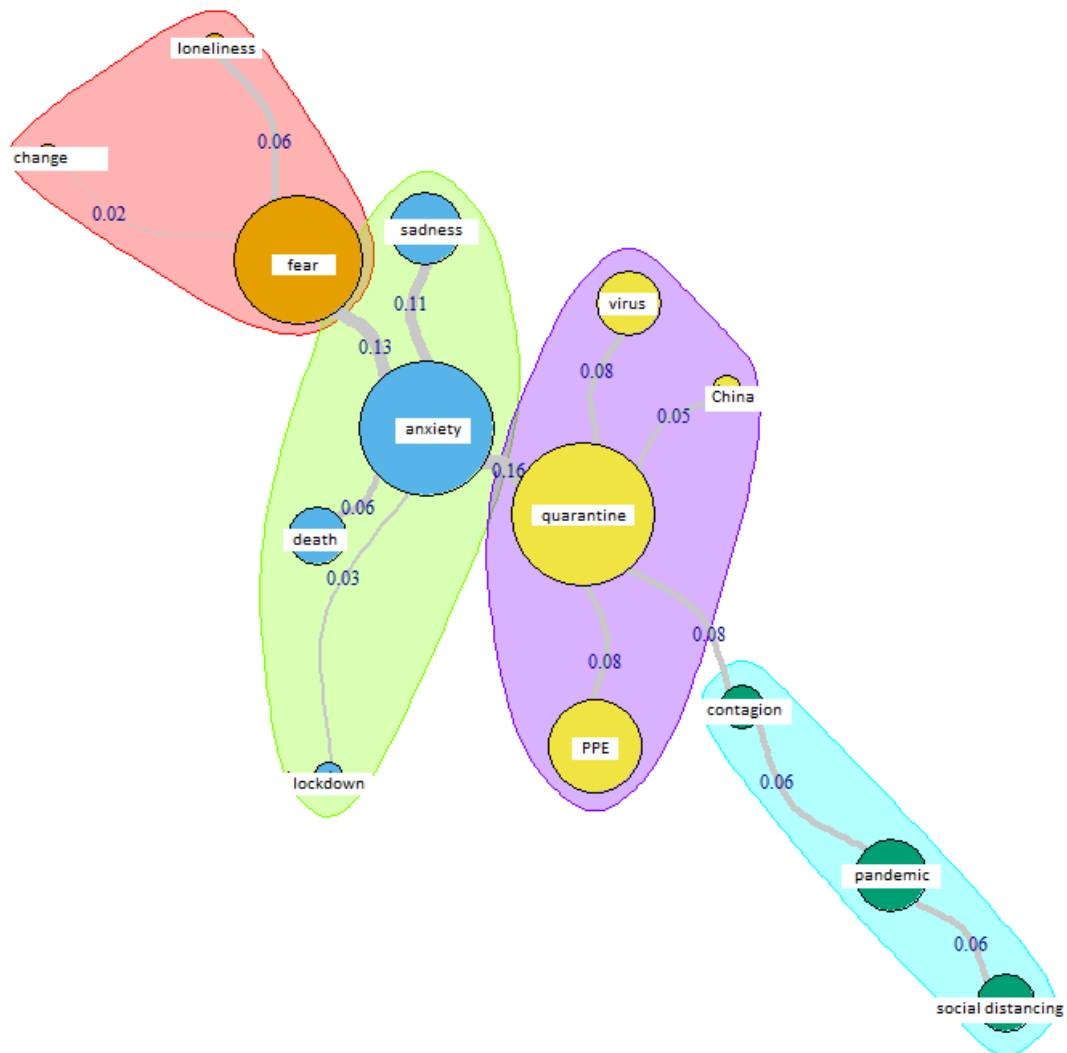


Figure 1. SH Social Representation - Internal configuration

The first configuration (Figure 1) concerns social sciences and humanities students' representation of the COVID-19. As shown in the graph, and coherent with previous results, the elements with the highest link between them (RR: 0.16) and the most significant degree of relatedness were *quarantine* and *anxiety*, both showing five links with other terms. Interconnections existing between the distinct justifications that respondents provided to explain their free associations indicate the centrality of these categories in the social representation structure. For example, student SH-F\_14 argues that "Ever since they let us go

out, I have been anxious to get the virus everywhere and I see the enemy everywhere". Quarantine, therefore, is also linked to the *virus* (RR: 0.08), *PPE* (RR: 0.08) and *China* (RR: 0.05). The category labeled PPE refers to all equipment that will protect the user against health risks (masks, gloves, hand sanitizer, et similia). The reference to China identifies the geographical origin of the pandemic, as pointed out by respondent SH-F\_13: "The first cases of COVID-19 occurred in Wuhan, China." The cluster dominated by the category *quarantine* presented an autonomous branch through the link with *contagion* (RR: 0.08). The latter was connected to *pandemic* (RR: 0.06), which, in turn, was linked to *social distancing* (RR: 0.06). The explanation offered by the student SH-M\_21 allows us to understand this associative trajectory: "The consequence of quarantine is social distancing, which increases individualism. In this case, thanks to our digital means, it has also created virtual cohesion. Perhaps in another era, this wouldn't have happened."

Moving on to the constellation of concepts gravitating around *anxiety*, it was connected to *lockdown* (RR: 0.03), *death* (RR: 0.06) and *sadness* (RR: 0.11). The links between these concepts are well explained by participant SH-F\_22, who says, "This virus leads to death, but not only because it attacks the immune system; it attacks above all the mental state of a person and, in this period, suicide rates have increased all over the world". The most crucial link within this aggregate was that between *anxiety* and *fear* (RR: 0.13), which in turn was significantly linked to *loneliness* (RR: 0.06). Respondent SH-F\_37 clarifies this connection: "Day by day, one lives with the fear of surviving. Furthermore, fear leads us to involuntarily exclude and reject those around us". Interestingly, though weak, the existing link between *fear* and *change* (RR: 0.02), which for the SH-F\_9 student, coincides with "Personal changes, environmental changes, economic changes" resulting from the COVID-19 pandemic.

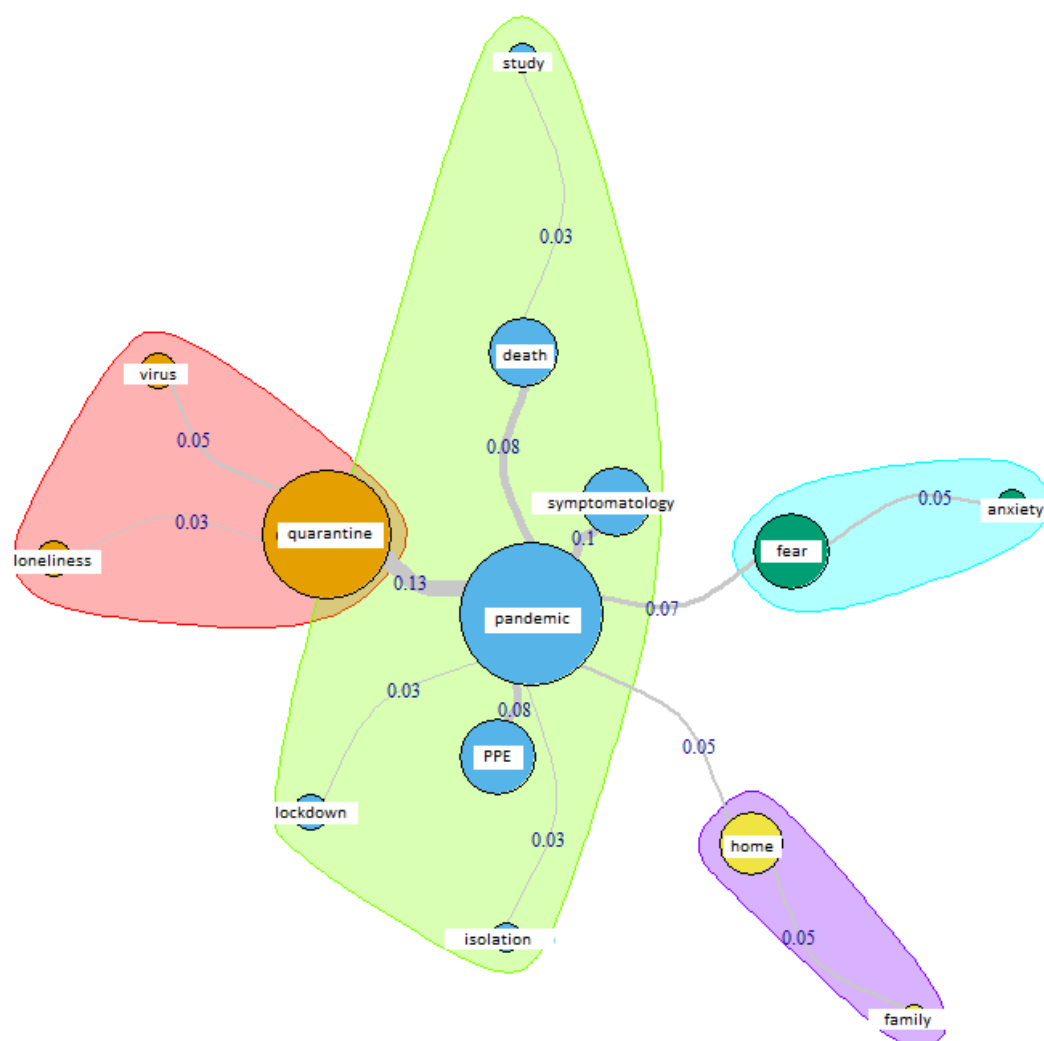


Figure 2. LS Social Representation - Internal configuration

The second graph (Figure 2) concerns life sciences students. Additionally, in this case, the hierarchies outlined thanks to the Sutrop (2001) index were confirmed. Cognitively, the more salient terms are also those that exhibit the most reliable interconnectivity. Specifically, the words of student LS-F\_33 explain the relationship between *pandemic* and *quarantine* well (RR: 0.13): "Quarantine is the aspect of the pandemic that has most affected people". The *quarantine* is linked to the COVID-19 *virus* (RR: 0.05) because, as interviewee LS-F\_16 recalls, some medical students have "studied it at length during the quarantine". This cluster

closes with the relationship between *quarantine* and *solitude* (RR: 0.03) clarified by the statement of student LS-F\_57: "it has cleared the possibility to see each other, to embrace each other. My parents, doctors, tried to keep us as far away from them as possible".

Although the *pandemic* was not at the top of the ranking using the Cognitive Saliency Index, it identifies the node with the highest clustering coefficient (Watts & Stogatz, 1998) of the entire representational structure because it is possible to observe as many as 8 of the 13 arcs (61.5%) present in the graph branch out from this concept. Specifically, on the one hand, we find three measures useful to contain the *pandemic*, linked to *lockdown* (RR: 0.03), *isolation* (RR: 0.03) and *PPE* (RR: 0.08). On the opposite side, we find the category that collects all references to *symptomatology* (RR: 0.1) of COVID-19, such as "pneumonia", "dyspnea", "cough" and "infections". The *pandemic*, for these future doctors, refers to the idea of *death* (RR: 0.08), considering that, as LS-M\_58 recalls, "caused many victims". This category, therefore, is linked to that of the *study* (RR: 0.03) probably because, as reported by the student LS-F\_43, everyone "tried to determine as much as possible about COVID-19". The cluster just described had two distinct branches. The first one originated from the link among *pandemic*, *fear* (RR: 0.07) and *anxiety* (RR: 0.05), well summarized by participant LS-M\_36: "The anxiety of returning to "normal", of being able to accomplish goals at home after three months, having at the same time, fear that everything could start again". The second one derived from the path among *pandemic*, *home* (RR: 0.05) and *family* (RR: 0.05), justified by the explanations given by interviewees LS-M\_58: "The time spent in the household has increased" and LS-M\_40: "I was at home for two months in a row".

## Representational Content

To the first item on the questionnaire, concerning the knowledge of the object of analysis, all interviewees answered that they knew what COVID-19 was and talked about it frequently. 79.4% of social sciences and humanities students and 72.1% of life sciences students stated that they talk about COVID-19, if not every day, at least 4 or 5 times a week (Table 2).

Table 2  
*How often do you talk about COVID-19?*

Response category labels	SH students		LS students	
	Freq.	%	Freq.	%

Every day	35	55.6	30	49.1
4 or 5 times a week	15	23.8	14	23.0
2 or 3 times a week	10	15.9	15	24.6
Once a week	2	3.2	1	1.6
Less than once a week	1	1.6	1	1.6
Total	63	100	61	100

When asked to specify who the main interlocutors were, all students involved in the study answered family (SH 61.9%; LS 59.0%) and friends (SH 33.3%; LS 39.3%) (Table 3).

Table 3  
*Who do you talk to most frequently about COVID-19?*

Response category labels	SH students		LS students	
	Freq.	%	Freq.	%
Family	39	61.9	36	59.0
Friends	21	33.3	24	39.3
Acquaintances	1	1.6	1	1.6
Others	2	3.2	0	0.0
Total	63	100	61	100

*Note. Chi-square: 2.288 p-value: 0.51482 Yates' Chi-square: 1.11 Yates' p-value: 0.77466*

The circumstances in which they discuss COVID-19 with others are "At home during television broadcasts and news coverage on the topic" (SH 39.7%; LS 47.5%), "At home during meals" and "Online with my contacts" (SH 19.0%; LS 16.4%) (Table 4). As shown by previous studies (Domínguez-Salas, Gómez-Salgado, Andrés-Villas, Díaz-Milanés, Romero-Martín & Ruiz-Frutos, 2020), the time spent on information on COVID-19, as well as the amount of time thinking about it, contributed to psychological distress and increased negative feelings. This emotional condition also characterized the interviewees, as described below.

Table 4  
*Under what circumstances do you most frequently discuss COVID-19 with others?*

Response category labels	SH students		LS students	
	Freq.	%	Freq.	%
At home during meals	12	19.0	10	16.4
At home if the topic is on television broadcasts, news...	25	39.7	29	47.5
At work/university/school, during breaks	4	6.3	2	3.3
Online with my contacts	12	19.0	10	16.4
When I go out and chat with friends...	7	11.1	9	14.8
Other	3	4.8	1	1.6

Total	63	100	61	100
<i>Note.</i> Chi-square: 2.545 <i>p-value:</i> 0.76970    Yates' Chi-square: 0.769    Yates' <i>p-value:</i> 0.97897				

The sources from which participants in the two subgroups draw their information about COVID-19 were television (SH 60.3%; LS 31.1%) and web (SH 38.1; LS 62.3%). Data in the next tables (Tables 5 and 6) show an interesting difference between the two subgroups of participants concerning the use of the sources. Specifically, life sciences students preferred internet to television and were almost the only ones to use the following sources of information: journals, scientific blogs and specialized or institutional sites.

Table 5

*Which of the following sources do you use most frequently to obtain information about COVID-19?*

Response category labels	SH students		LS students	
	Freq.	%	Freq.	%
Television	38	60.3	19	31.1
Web	24	38.1	38	62.3
Press	0	0.0	3	4.9
Other	1	1.6	1	1.6

*Note.* Chi-square: 12.466    *p-value:* 0.00595    Yates' Chi-square: 10.149    Yates' *p-value:* 0.01734

Table 6

*Detailed sources most frequently used to obtain information about COVID-19*

Response category labels	SH students	LS students
	Freq	Freq
Television		
<i>news</i>	34	17
<i>infotainment</i>	4	2
Web		
<i>social network</i>	3	2
<i>on-line newspapers and news</i>	11	9
<i>journals, scientific blog and specialized sites</i>	2	8
<i>institutional sites</i>	5	17
<i>google (news)</i>	3	2
Press		
---		3
Other		
<i>I do not have a privileged source</i>	1	
<i>I like to compare more references</i>		1

Concerning respondents' beliefs about COVID-19, it is interesting to note that social sciences and humanities' students thought that the virus arose out of "Natural genetic



mutation" (17.5%), "Experiments/Laboratory error" (15.9%) or "Lack of hygiene in Chinese markets" (14.3%). In contrast, medical students believe that the current pandemic derives from "Spillover/Zoonosis" (29.5%), "Natural genetic mutation" (27.9%), "Lack of hygiene in Chinese markets" (11.5%) and "Human irresponsibility" (11.5%). Life sciences students exhibited greater technical competence, as expected, but surprisingly, also exhibited more considerable attention to human responsibility in determining the pandemic. Social sciences and humanities students were the only ones who thought that COVID-19 may have been born from a laboratory error and made direct reference to conspiracy theories (Table 7). These students also declared themselves to be primarily anti-political and non-partisan (see Table 16). In Italy, the movements in which candidates represent these requests are also those that in the period considered, referred to these models of explanation in their public speeches.

Table 7  
*What are the origins of COVID-19?*

Response category labels	SH students		LS students	
	Freq.	%	Freq.	%
Experiments/Laboratory error	10	15.9	3	4.9
Lack of hygiene in Chinese markets	9	14.3	7	11.5
Natural genetic mutation	11	17.5	17	27.9
Human irresponsibility	3	4.8	7	11.5
Spillover/Zoonosis	6	9.5	18	29.5
The Chinese eat bats and every kind of animals.	3	4.8	3	4.9
Conspiracy theories	6	9.5	0	0.0
Pollution/Ecosystem destruction	4	6.3	0	0.0
Its origin is still unclear	6	9.5	0	0.0
No answer	5	7.9	6	9.8
<b>Total</b>	<b>63</b>	<b>100</b>	<b>61</b>	<b>100</b>

Note. Chi-square: 28.971 p-value: 0.00065 Yates' Chi-square: 20.389 Yates' p-value: 0.01566

Concerning anchoring processes, the two subgroups of participants did not seem to show significant differences. Basically, all respondents associated COVID-19 with the same disturbing events: Spanish flu (SH 33.3%; LS 45.9%), plague (SH 25.4%; LS 9.8%) and severe acute respiratory syndrome (SARS) (SH 14.3%; LS 18.0%) (Table 8).

Table 8  
*To what disturbing event, to which you are already familiar, can COVID-19 be compared to?*

Response category labels	SH students	LS students
--------------------------	-------------	-------------

	Freq.	%	Freq.	%
Spanish flu	21	33.3	28	45.9
Plague	16	25.4	6	9.8
SARS	9	14.3	11	18.0
It is comparable to nothing	5	7.9	2	3.3
War	4	6.3	4	6.6
Cholera	3	4.8	4	6.6
Earthquake	3	4.8	0	0.0
Ebola	0	0.0	3	4.9
H1N1	1	1.6	3	4.9
AIDS	1	1.6	0	0.0
Total	63	100	61	100

*Note.* Chi-square: 15.146    *p*-value: 0.08701    Yates' Chi-square: 7.985    Yates' *p*-value: 0.53566

Concerning the other generative process, social sciences and humanities students objectified COVID-19 by ontologizing it in bats (41.3%) and other animal species (12.7%), such as lion, fish, insects, leeches, snakes, mosquitoes and hyenas. Even life sciences students used the bat (47.5%) to lend materiality to something as abstract as COVID-19. Unlike social sciences and humanities students, they ontologize the disease by using subjects involved in the front line in an attempt to combat it and with whom they identify: doctors, medical staff (13.1%) (Table 9).

Table 9  
*Which person, object, animal, etc. does COVID-19 make you think of?*

Response category labels	SH students		LS students	
	Freq.	%	Freq.	%
Bat	26	41.3	29	47.5
Different animals	8	12.7	2	3.3
Doctors, medical staff	4	6.3	8	13.1
Viruses, bacteria	3	4.8	2	3.3
China/Chinese people	2	3.2	4	6.6
Politicians	2	3.2	4	6.6
Shadow	2	3.2	1	1.6
Other	8	12.7	9	14.8
No answer	8	12.7	2	3.3
Total	63	100	61	100

*Note.* Chi-square: 10.593    *p*-value: 0.22584    Yates' Chi-square: 6.093    Yates' *p*-value: 0.63681

As far as the perception of risk is concerned, both subgroups of respondents seemed to have little concern about either contracting COVID-19 personally or about the disease affecting those closest to them. When explicitly asked about these issues, students argued that

they consider the risk that their friends or family members might contract the virus as considerably low (SH 79.4%; LS 88.5%). In addition, for the personal risk of contracting Sars-Cov2 disease, all respondents were somewhat optimistic, using primarily the response modalities that constitute a positive pole of the attitudinal continuum (SH 82.5%; LS 93.4%) (Tables 10 and 11).

Table 10

*Among the people you know/meet, the risk of contracting COVID-19 is:*

	SH			LS		
	Freq.	%	Cum.%	Freq.	%	Cum.%
Very low	10	15.9	15.9	1	1.6	1.6
Moderately low	10	15.9	31.7	20	32.8	34.4
Slightly low	30	47.6	79.4	33	54.1	88.5
Slightly high	9	14.3	93.7	5	8.3	96.7
Moderately high	3	4.8	98.4	2	3.3	100
Very high	1	1.6	100	0	0.0	
Total	63	100		61	100	

*Note.* Chi-square: 13.154 *p-value:* 0.02198 Yates' Chi-square: 9.259 Yates' *p-value:* 0.09917

Table 11

*Your personal risk of contracting COVID-19 is:*

	SH			LS		
	Freq.	%	Cum.%	Freq.	%	Cum.%
Very low	10	15.9	15.9	7	11.5	11.5
Moderately low	14	22.2	38.1	16	26.2	37.7
Slightly low	28	44.4	82.5	34	55.7	93.4
Slightly high	9	14.3	96.8	3	4.9	98.4
Moderately high	1	1.6	98.4	1	1.6	100
Very high	1	1.6	100	0	0.0	
Total	63	100		61	100	

*Note.* Chi-square: 5.212 *p-value:* 0.39056 Yates' Chi-square: 3.224 Yates' *p-value:* 0.66549

With respect to expectations for the future, participants exhibited a great sense of trust considering that, again, they preferred the positive modalities of scales submitted to them. In particular, 76.2% of social sciences and humanities students and 83.6% of life sciences students believe that at the current state of medical knowledge, the COVID-19 is preferably and quite curable, while it will undoubtedly be in the near future (SH 100%; LS 100%) (Tables 12 and 13).

Table 12

*At the current state of medical knowledge, COVID-19 is:*

	SH			LS		
	Freq.	%	Cum.%	Freq.	%	Cum.%
Not at all curable	1	1.6	1.6	1	1.6	1.6
Very little curable	2	3.2	4.8	2	3.3	4.9
Not very curable	12	19.0	23.8	7	11.5	16.4
Rather curable	27	42.9	66.7	27	44.3	60.7
Quite curable	14	22.2	88.9	18	29.5	90.2
Curable	7	11.1	100	6	9.8	100
<b>Total</b>	<b>63</b>	<b>100</b>		<b>61</b>	<b>100</b>	

*Note.* Chi-square: 1.861 *p-value:* 0.86803 Yates' Chi-square: 1.796 Yates' *p-value:* 0.87659

Table 13

*In the future, COVID-19 will be:*

	SH			LS		
	Freq.	%	Cum.%	Freq.	%	Cum.%
Not at all curable	0	0.0	0.0	0	0.0	0.0
Very little curable	0	0.0	0.0	0	0.0	0.0
Not very curable	0	0.0	0.0	0	0.0	0.0
Rather curable	6	9.5	9.5	5	8.2	8.2
Quite curable	18	28.6	38.1	21	34.4	42.6
Curable	39	61.9	100	35	57.4	100
<b>Total</b>	<b>63</b>	<b>100</b>		<b>61</b>	<b>100</b>	

*Note.* Chi-square: 0.506 *p-value:* 0.99190 Yates' Chi-square: 0.224 Yates' *p-value:* 0.99883

Finally, we analyzed the emotions experienced by participants as a result of the COVID-19 pandemic (see Figure 3 and Table 14). We considered the scientific area of study as a response variable (with 2 modalities: SH students; LS students) and considered 11 possible predictors coming from the factor's matrix. We built a classification tree to explain the relationship between group appurtenance and COVID-19-related emotions. Therefore, we defined the importance of each predictor (single emotion) concerning the dependency structure of the response variable (group appurtenance). The classification tree was made with IBM-SPSS 25 and built using the generalized Gini splitting function based on scores' absolute differences. In particular, the cost of misclassification depends on the absolute differences in scores assigned to categories within the response. We obtained a selection of the optimal tree size with a procedure based on the cost-complexity metric. We selected the final tree via 10-fold cross-validation and used 1 – SE rule for the tree pruning procedure, identifying a final tree with ten terminal nodes. The misclassification error rate was equal to

0.298. The selected tree had L=6 terminal nodes. Figure 3 shows the classification tree obtained and Table 14 its reliability. We focused the analysis primarily on the differentiation between the two groups of students involved in the study.

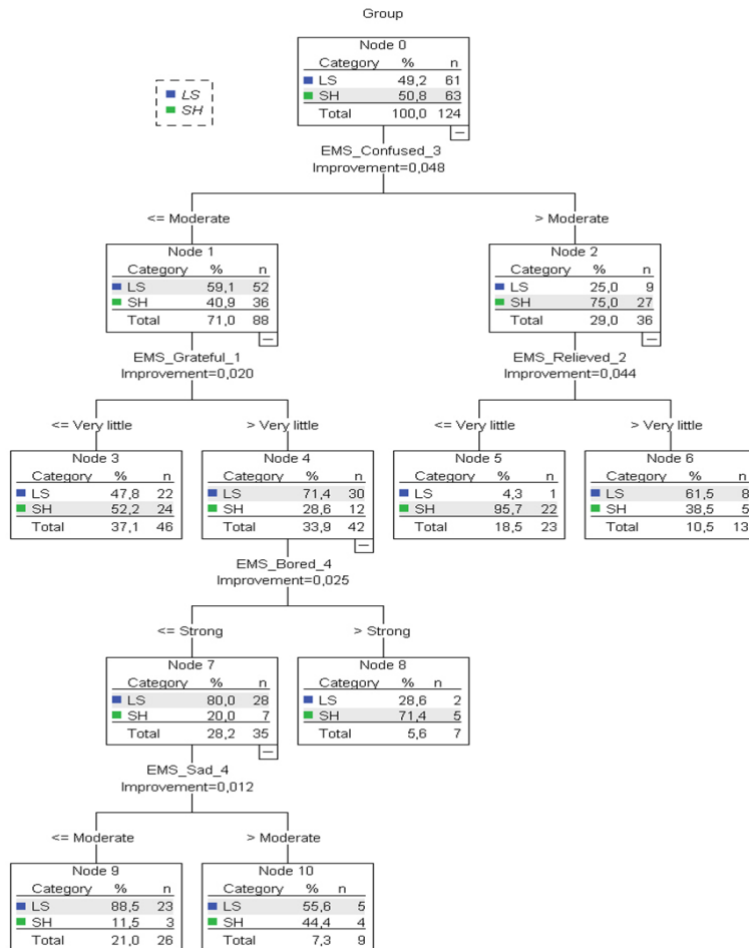


Figure 3. Emotions' classifications tree

Table 14

Classifications' reliability

	LS students	SH students	Percent Correct
LS students	36	25	59.0%
SH students	12	51	81.0%
Overall percentage	38.7%	61.3%	70.2%

Note. Growing Method: CRT – Dependent variable: Group

The most important node (terminal node 1) represents 71.0% of the interviewees and corresponds to the lowest number of *confused* by the situation. Respondents belonging to this

node (LS 59.1%; SH 40.9%) were characterized by low ratings (“not at all/very little/moderate”) concerning this emotion ( $\leq$  Moderate). Looking to node 2, it is possible to see that *confused* obtained higher ratings ( $>$  Moderate) in 36 of the 124 interviewees, which were essentially social sciences and humanities students (75.0%). This node is divided by the *relieved* emotion. In this case, 23 of the 36 students who belonged to the node utilized "not at all" or "very little" to describe the intensity of this emotion (SH 95.7%; LS 4.3). Among others who used higher ratings ( $>$  Very little), life sciences students are more representatives (61.5%). Returning to node 1, it is divided by the *grateful* emotion. In particular, 46 of the 88 students who experienced this emotion "very little" or "not at all" (37.1%) were mostly social sciences and humanities students (52.2%). On the other hand, 42 of the 88 who felt *grateful* (from "moderate" to "very strong") were essentially life sciences students (71.4%). The *bored* emotion split this node into two different sub-nodes. The first (node 7) was characterized by 28.2% (LS 80.0%) of respondents who considered themselves less *bored* ( $\leq$  Strong). The second (node 8) was characterized by 5.6% of the sample who were very strongly affected by this emotion ( $>$  Strong). Finally, the last two nodes were generated by the emotion *sad*. Respondents belonging to node 9 (21.0%) were mostly life sciences students (88.5%) and suffered little sadness due to COVID-19. Furthermore, those (7.3%) who experienced higher levels of this emotion ( $>$  Moderate) and belonged to node 10 were fundamentally life sciences students (55.6%).

At this point, we compared the results obtained to the taxonomy of three recurrent common sense explanatory patterns proposed by Eicher and Van Gerter (2015, p. 386): "Divine punishment, immoral or unhygienic actions of out-groups, and malevolent actions of powerful groups". Social sciences and humanities students seemed to use the pattern of malicious actions carried out by power groups, as they are the only ones who referred to conspiracy theories. In both subgroups of respondents, the pandemic pattern was absent as divine punishment, likely because about half of participants declared themselves non-believers (Table 15). In contrast, all students involved in the study used the pattern related to the unhygienic or sharable practices of the Chinese, summarized among others by categories of explanations, such as "Lack of hygiene in Chinese markets" (SH 14.3%; LS 11.5%) and "The Chinese eat bats and every kind of animals (SH 4.8%; LS 4.9%). The cited patterns, in line with those described by Eicher and Van Gerter (2015), interacted with patterns of expert scientific knowledge, which was the dominant explanation model for both social sciences and humanities and life sciences students.

Table 15  
*Religious orientation*

Response category labels	SH students		LS students	
	Freq.	%	Freq.	%
Agnostic	2	3.2	3	4.9
Non-practising believer	19	30.2	21	34.4
Practicing believer	7	11.1	11	18.0
Non-believer	31	49.2	22	36.1
No answer	4	6.3	4	6.6
Total	63	100	61	100

*Note.* Chi-square: 2.686 *p-value:* 0.61167 Yates' Chi-square: 1.729 Yates' *p-value:* 0.78544

Table 16  
*Political orientation*

Response category labels	SH students		LS students	
	Freq.	%	Freq.	%
Anarchist	2	3.2	0	0.0
Antipolitical	9	14.3	0	0.0
Non-partisan	20	31.7	16	26.2
Center	3	4.8	1	1.6
Center right	1	1.6	2	3.3
Center left	5	7.9	19	31.1
Right	2	3.2	0	0.0
Left	17	27.0	20	32.8
No answer	4	6.3	3	4.9
Total	63	100	61	100

*Note.* Chi-square: 23.304 *p-value:* 0.0030 Yates' Chi-square: 15.83 Yates' *p-value:* 0.04488

## DISCUSSION AND CONCLUSIONS

The Theory of Social Representations was created by Serge Moscovici (1961) as a system of knowledge elaborated and socially shared, orienting behaviors and intervening in the definition of individual and social identity, as well as in the construction of objects. It is transmitted through communication and language and has a practical purpose, guiding conduct and communication, being embodied in practices and participating in the construction of the social reality of a given group. Consensual within the group, these ideas may differ from those of other groups and are, therefore, "subject to dilemmas and conflicts. They are inseparable from social memory and are formed in deposits, some of which remain as traditional knowledge and some of which can be updated to give meaning to new situations that individuals face" (Jodelet, 2013, p. 41). As well illustrated in recent meta-analysis (Sousa,

Moura, Moura, Lago, Matos, Monte et al., 2017), the Social Representations Theory is applied in studies of different areas of knowledge, especially in psychology, and anthropology, collaborating in the elaboration of new images and conceptions about social reality, especially in the field of health and illness, whether old or new (Cañón Rodríguez, Marín & Fasanelli, 2018; Fasanelli, Galli, Grassia, Marino, et al., 2020).

In this framework, we designed and conducted this study in order to identify the social representation of COVID-19. More specifically, we tried to answer questions about the existence of differences between the social representations of COVID-19 elaborated by social sciences and humanities students and life sciences students. As is well known, talking about differences between social representations of the same object, it is necessary to address different representational structures. To verify this assumption, it is necessary to refer to data relating to the explicit content of the representation studied, in other words, to those data coming from the analysis of structures, as well as those derived from the analysis of generative processes, emotions, expectations and explanation models used by participants in the study.

Starting from the core and peripheral elements, the universe of the cognitions possessed by the interviewees about COVID-19 seemed to delineate two distinct articulations, despite the two subgroups sharing 65% of the constituent elements of the social representation's internal structure: *quarantine, anxiety, pandemic, PPE, fear, death, virus, lockdown, and loneliness*. These data appear to be consistent with previous studies that have highlighted that "outbreaks of emerging infectious diseases can be associated with considerable anxiety and fear in the general public or in specific communities, especially when the infection rate and deaths are substantial" (Lin, Hu, Alias, & Wong, 2020, p. 2). Mass fear of COVID-19 originates a neologism, "coronaphobia", and generates a plethora of psychological manifestations across the different strata of society on the whole planet (Asmundson & Taylor, 2020 cit. in Dubey et al., 2020).

The differences in COVID-19 conceptions between the two subgroups seem particularly interesting. While social sciences and humanities students frequently referred to *sadness, China, contagion, social distancing, and change*, life sciences students often talk about the *symptomatology* of COVID-19, as well as *home, study, family, and isolation*.

"To be different, two representations must be organized around two different central cores. It is the organization of this content that is essential here. Two representations defined



by the same content may be radically different if the organization of this content, and thus the centrality of certain elements, is different" (Abric, 2001, p. 44).

As shown by the analysis of similarities, the internal configuration of the representations of COVID-19 allows us to speak of two completely different central cores. The first identifies the social sciences and humanities students and shows the emotional evaluation aspects of the situation. For these students, the quarantine invokes all negative feelings, such as anxiety and fear, as reported in some studies previously interviewed on the subject (Idoiaga Mondragon, et al., 2017b; Lee, Jobe, Mathis, & Gibbons, 2020). The second distinguishes the life sciences students and is strongly focused on the descriptive aspects of the situation: a pandemic that has determined the need to lock themselves in for a long period of quarantine. This good tolerance of the confinement measure, despite its brutal and constraining nature, undoubtedly has several explanations. One factor, as underlined by Ingold (2020), seems to have played a decisive role: shared anxiety in the face of the epidemic threat.

The two subgroups exhibited greater convergence when comparing the products of the generative processes of COVID-19's social representation. In line with what Paez and Pérez (2020) assert, the anchoring processes of our interviewees also referred to the "big" epidemics, from the oldest ones, such as the plague or the Spanish flu, to the most recent ones, such as SARS, H1N1 and Ebola. Unlike anchoring, participants' objectification takes different trajectories from those foreshadowed by the mentioned authors. Most students in both groups ontologized the Sars-Cov2 disease in a bat capable of giving reality to an unfamiliar concept. What previously resided in a very distant universe now appears physical, accessible, and at hand. Objectifying, after all, means discovering the iconic aspect of an idea or a poorly defined being, reproducing a concept in an object, in this case, an animal.

Interviewees also seemed to differentiate themselves from the emotions they experienced concerning the pandemic. At an overall glance, the feeling of *confusion* turns out to be the discriminating emotion. The most confused students were those from social sciences and humanities who also felt the least relieved in this dramatic situation (95.7%). Life sciences students also felt confused (49.2%); however, among them (59.2%), some students claimed to be more "grateful" (71.4%), less "bored" (80.0%) and less "sad" (88.5%) than their social sciences and humanities colleagues (Figure 3). In our opinion, the assigned importance to the emotion "confused" could be explained by the "unofficial and sometimes conflicting data circulating in the media. Of the multitude of people tested for COVID-19 in Italy, as well

as in other countries, it is unclear how many were asymptomatic versus symptomatic, and it is unclear whether a homogeneous criterion for testing was applied. Data are lacking on the prevalence of the disease among asymptomatic populations, so the real prevalence of COVID-19, its spectrum of presentation, and the real mortality rate all remain unknown" (Lazzerini & Putoto, 2020, p. e641).

The beliefs relating to COVID-19 also confirmed differences between the two groups. Participants in the social sciences and humanities group were the most inclined to adopt conspiracy explanation models (SH 25.4%; LS 4.9%), while those in the life sciences group exhibited their scientific competence with more considerable attention to the human responsibility in determining the situation. This difference was likely also explained by the types of sources used by respondents to learn about COVID-19. Future social scientists will make more use of traditional media, sharing a more consensual and emotional knowledge. In fact, according to Olagoke, Olagoke & Hughes (2020), frequent exposure to coronavirus disease news on mainstream media is associated with adverse psychological outcomes. In contrast, future physicians will use new media more consciously, considering that they are the only respondents who claim to use specific scientific literature on Sars-Cov2, as well as institutional sites, as evidenced by the correctness of their knowledge on the pandemic, overlapping with that of specialists in the field (Ruffell, 2020). As is well known "media is a relevant information source in construction of the social representation of the threat. Thus, it can be stated that the media form part of both the container of the information and the information content of the communication process" (Idoiaga Mondragon, Gil de Montes & Valencia, 2017a, p. 327).

Considering what we described so far, it seems legitimate to state that the two subsamples present two different social representations of the studied phenomenon. While social sciences and humanities students shared a representation dominated by emotional aspects of anxiety, life sciences students seemed to feel less threatened by the spread of the epidemic, sharing a social representation dominated by cognitive implications and possession of specific skills on the subject.

An interesting finding is represented by the fact that all interviewees were characterized by having entertained a high number of verbal interactions of informal type (family and friends) on the topic. According to Moscovici (1961), interpersonal communication is the privileged place of approximation, and within it, people exchange unverifiable information and improbable hypotheses. Within this kind of communication, all transformations,

interpretations and shifts of meaning, due to the absence of any kind of institutional and epistemic control, take place (Moliner, 2001). The only element that differentiates the choice of information sources between the two students' groups is related to the use, by life sciences participants only, of specialized sources. Therefore, it seems that interviewees who showed greater control of their negative emotions did so because they were better able to search and select legitimate sources with accurate information (Joffe & Lee, 2004).

"Moscovici distinguishes two types of social representations: wet and dry. The former shape our social and individual reality directly, while the latter do so indirectly. Wet representations are more related to consciousness, therefore existence, and dry representations to science, therefore matter" (Kalampalikis, 2019, p.178, our translation).

The social representation of COVID-19 would have all the characteristics to be classified as a dry representation. It is an object inscribed within the technical knowledge of specific science, already starting from the acronym that identifies it. Not all people who use it in their daily talk know its real meaning (Co=corona, Vi=virus, D=disease, 19= 2019), precisely as most scientific concepts used in common language. The power to modify social behavior, which experienced COVID-19, pushes to include this representation among those defined as moist. It has been able, in a short time, to wedge itself into the collective consciousness, modifying the relationships of self and hetero perception (think about the alteration of the body scheme induced by the use of PPE) and even reshaping our lives.

To return to the broader theoretical-epistemological discourse from which we started, the results obtained lead us to reconsider the usefulness of applying the Theory of Social Representations within the strand of risk psychology. Unlike more traditional approaches to the perception of risk, Social Representations Theory does not limit its horizon to the correctness of the responses to risk. Whether they are false, weak, biased or deficient, Social Representations Theory deals with "why and how" societies create both social representations and the common sense that generates them (Joffe, 2002; 2003; Joffe & Lee, 2004).

By differentiating itself from the dominant approaches in the field of social cognition, the approach to social representations aims at overcoming, on the one hand, rationality as an epistemological model for thinking about man and, on the other hand, the "rational/irrational" opposition for studying beliefs in the field of health and disease (Apostolidis & Dany, 2012).

In other words and to conclude, according to this perspective, people look at risk through the filter of their group and historical/cultural belonging. Therefore, both from the contemporary imaginary to which they are exposed and from the adversities of the past and

these elements, far from "distorting" the real risk, represent "reality" in the minds of the people who relate to it.

This study is not without limitations. The sample consisted of university students and was therefore not representative; hence, these results may not be generalizable to the Italian population (Montella, et al., 2019). The use of a mixed-methods design makes it challenging to establish causality and licenses a careful interpretation of the results. A media content analysis did not support our analysis of respondents' exposure to mass and social media. Nevertheless, the results are consistent with other studies, as shown in the Discussion and Conclusions section. The authors intend to extend the analysis to a larger population and, above all, to consider not only subjective perceptions and self-reports but also data related to social practices affected by the pandemic (i.e., doctors' professional practices) and other analytical dimensions. Projects along these lines are underway (Fasanelli, D'Alterio, De Angelis, Piscitelli & Aria, 2017).

We hope this study serves as a point of departure in an unprecedented situation and at a critical historical moment. We believe that these data provide useful information for comparison to other social groups or countries, especially in case of future epidemics.

Finally, such as our results may also be useful to a broader, non-expert audience, hoping that they may open up spaces for reflection on the theme of personal responsibility in the propagation and, therefore, in the prevention of phenomena, such as pandemics, apparently disconnected from the role of individual social actors. After all, as David Quammen pointed out, already in 2014, we humans dominate this planet such as no other species has ever done before. However, this has consequences, and some of them take the form of a pandemic. This is not something that has happened to us before and is the result of the things we do, and the choices we make. We are all responsible for the consequences (Quammen, 2014).

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ROBERTO FASANELLI (Ph.D. in Health Psychology, individual and social risk prevention) is an Assistant Professor of Social Psychology and Risk Psychology at the Department of Social Sciences of the University of Naples “Federico II”. He was visiting professor at the "A.I. Cuza" University of Iasi (Romania) and at the National University of Colombia, Bogotá. His research interests are mainly in the epistemo-methodological framework of Social Representations, but he is also devoted to: Social Psychology of Health, Environmental Psychology, Risk Psychology and Evaluative Research. He is also a consultant to ONGs/Public Administrations, Team Building trainer for startupper and a social worker trainer on gender gap issues.

E-mail: roberto.fasanelli@unina.it

ALFONSO PISCITELLI (Ph.D. in Statistics) is an Assistant Professor of Social Statistics at the Department of Agricultural Sciences of the University of Naples “Federico II”. He was visiting researcher at the Division of Methodology and Statistics in the Institute of

Psychology of Leiden University (NL). His research interests include Data Mining; Missing Data Theory; Data Fusion; Performance and Satisfaction Analysis. He participated in several research projects and also in several evaluation programs of public policies in the European Social Fund. He has published in books and technical journals, including Social Indicators Research, Quality & Quantity and Italian Journal of Applied Statistics.

E-mail: [alfonso.piscitelli@unina.it](mailto:alfonso.piscitelli@unina.it)

IDA GALLI is a Full Professor of Social Psychology at the Department of Social Sciences of the University of Naples “Federico II”. She was Directeur d'Etudes Associée at the Maison des Sciences de l'Homme in Paris. Currently she is the Director of the Mediterranean Centre for the Study of Social Representations associated to the REMOSCO (Reseau Mondial Serge Moscovici). She authored scientific books and over a hundred papers published on specialized journals. Her research interests are mainly in the theoretical framework of Social Representations. She is also interested in psychological androgyny and correlational studies on gender and Machiavellianism, anxiety, locus of control and interindividual power strategies.

E-mail: [idagalli@unina.it](mailto:idagalli@unina.it)