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COVID-19 and Cause-Seeking. An Exploratory Study in Italy

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Abstract: In 2020, over 2 million Italian people contracted the SARS-CoV-2 virus. A pandemic of this magnitude and the very stringent countermeasures that have been adopted had a disruptive effect on people's lives, at a psychological, social, and economic levels. The exploratory study illustrated in this article focuses on the search for causes carried out by people and prompted by the climate of great uncertainty that has characterized the situation so far. In particular, the causal attributions for a possible contagion are examined, which play a key role to improve the effectiveness of the prevention and the management of the contagion. The study has involved 575 participants, who were selected through a snowball sampling technique. Given the exploratory nature of this study, descriptive and chi-square analyses were conducted to ascertain whether respondents' characteristics, such as their socio-demographics, were related to the causal attributions made. The main results highlight a strong overall preference for external causes and significant correlations between the controllability and stability of the causes and the respondents' age and educational level. The results suggest the importance of encouraging cooperation between community agencies and social media, exploiting the latter's ability to spread information, to better manage communication, and improve the quality of information. This intervention may be helpful in that allowing people to better handle information can enhance the people's regular course of information processing and the subsequent attribution of causes to the events, thus reducing fear and anxiety.

Keywords: Causal Attributions, Causal Dimensions, COVID-19, Cause-Seeking

Introduction

Pandemic and Cause-Seeking

In December 2019, a highly contagious atypical viral pneumonia appeared in Wuhan, China. The pathogen was proved to be a novel coronavirus which was named SARS-CoV-2 afterward. In the following weeks, the outbreak rapidly spread to 28 other countries, making an increasing number of countries more and more aware of the gravity of the situation and letting them try to identify effective intervention strategies. Italian institutions, after the first moment of uncertainty, opted for the lockdown, a drastic containment measure that remained in force in its most restrictive form for about 2 months (from 9 March to 4 May 2020). Lockdown suspended social, educational, commercial, and productive activities and compelled people to stay at home, profoundly limiting social relations.

Along with the relevant social and economic effects, this situation has had a deep impact on the psychological well-being of individuals: In addition to the obvious fear of being infected, people have experienced the negative effects of social isolation, the inevitable rethinking of individual or family projects and extreme uncertainty (Colì *et al.*, 2020).

Uncertainty, mostly due to incomplete and unsatisfactory knowledge, is certainly one of the main aspects that have characterized the experience of people in this situation: Messages from politicians (at a national and local level) and experts, sometimes conflicting, have described a disease of which an in-depth knowledge and truly decisive therapy is lacking to date.

The situation that has just been described contains the main factors capable of triggering a cause-seeking process (Weiner, 2001; Roesch and Weiner, 2001; Graham, 2020) and this is especially true if considering both the human aspiration to control one's environment and to increase knowledge and the disruption of a tragic and unexpected event such as the one described. It would therefore be extremely interesting to investigate this process and its results, both to know the explanations identified by people concerning the phenomenon and because of the influence

that these explanations may have on emotions that people experience and, on the way, they behave ("Why?", "So what?") (Kelley, 1973; Weiner and Graham, 1990).

Causal Attributions

Causal attributions can be defined as opinions on the causes of behaviors or events and constitute essential elements in the individual's relationship with the world around him since they satisfy his innate, peculiar motivation for knowledge and mastery of the environment (Weiner, 2001).

According to Heider (1958), the analytical commitment activated by the individual is comparable to that of a real experiment in social psychology and the accuracy of the analysis is proportional to the amount of collected information. This analytical commitment will be also aimed at evaluating three aspects, the *causal dimensions*, which are fundamental in the definition of the attribution and whose impact on the consequences of the attribution is even greater than that of the attribution itself (Weiner, 1985; Roesch and Weiner, 2001). These dimensions represent the underlying properties of causes and refer to the location/Locus of the cause (internal or external) to the agent, whether the cause is stable over time (Stability) or whether the cause is or is not subject to volitional change (Controllability) (Weiner, 1979). For example, a person may wonder what is causing a stomach ache (event) that a friend of hers has. The person will try to understand if the cause that produced the friend's stomach ache is an element internal or external to her/him if it is a cause that acts stably over time and if her friend can influence this cause. The person will then consider if, for example, the friend has eaten too many sweets or if, after eating, she/he has caught a cold. The person will also reflect on whether or not a virus can cause such symptoms. At this stage, the observer is wondering if the cause of the event is internal (the friend's behavior) or external to her/him (the virus). Let us suppose that the person decides to ascribe the responsibility for her friend's stomach aches to her/his sweet tooth. The "investigation" will also consider the stability over time of the action exercised by the supposed cause: The observer may wonder if her/his friend is one who never pays attention to what she/he eats or if he is unable to resist the appeal of sweets. In the first case, the attribution will be of substantial stability, as it will repeat over time. Otherwise, the cause of the event will be considered unstable: E.g., the friend stuffed herself/himself with sweets during a party, but it is unusual for her/him. Another issue that can be raised by the observer concerns whether or not the friend (the agent) can control the event. The answer is possibly positive, assuming that her/his friend can choose to be more or less careful to moderate in eating: That is, the friend can control the number of sweets she/he eats and, therefore, whether or not to expose herself/himself to the risk of stomach ache.

Although the result of the attribution process is far from perfect, due to its complexity and some recurring biases specific to the field of social cognition (Ross *et al.*, 1977; Jones and Nisbett, 1987), the importance of the study of causal attributions and, especially, causal dimensions, mostly emerges considering the direct or indirect consequences on behavior.

Causal Dimensions and Behavior

Weiner's seminal work (1985) aimed at emphasizing the role played by causal dimensions in contributing to defining and modulating the emotions and the behaviors resulting from attribution (Harvey and Martinko, 2009). Weiner mainly focuses on the significance of the dimension Locus of causality in shaping emotions and behaviors. Self-attributing the cause of an unpleasant event (for example, getting infected, as in the case of the present study) easily arouses self-directed negative emotions, such as feelings of guilt and shame; on the other hand, attributing the cause of the negative event to outside the individual provokes anger and resentment towards the supposed agent (Weiner, 1985; Overwalle *et al.*, 1995; Gundlach *et al.*, 2003). The impact of the Stability dimension seems to influence more the expectations for the future and the power to change the direction of things. Attributing a failure to a cause perceived as unstable affects future expectancies less than perceiving the cause as stable: A failure due to unstable causes such as lack of effort or bad luck is reasonably viewed as easier to overcome. When a cause is perceived as stable, on the other hand, the emotions aroused range from hope (motivated by the expectation of future success) in the case of a positive event to the feeling of helplessness, in the case of a negative event (Overwalle *et al.*, 1995).

Finally, Controllability appears to be related to *responsibility*: Recognizing that an agent could have chosen to behave differently is equivalent to holding him responsible for the event (Weiner, 1995). The affective and behavioral outcomes are various because they are influenced both by the nature of the event (positive or negative) and by the perception of the agent's ability to control the event. They range from a sense of gratitude (positive event and inability to control), to an increase of self-confidence (positive event and ability to control), to compassion (negative event and inability to control), to anger (negative event and ability to control). A key shared aspect of controllable events, pleasant or unpleasant, is the individual's feeling of being able to intervene in similar situations to modify their outcome (or maximize the probability of a similar outcome if it is positive) (Overwalle *et al.*, 1995; Ingledew *et al.*, 1996; Murray *et al.*, 2021).

Naturally, the attribution made by an observer in front of an event should be considered as a collage of as many characteristics as the attributive levels involved in this phase of the inference process; these characteristics,

blending, increase the number and complexity of possible emotional and behavioral outcomes. Locus, Stability, and Controllability seem to elicit very different emotions and reactions, depending on the overall attribution made by the observer: On an interpersonal level and in the case of unpleasant events, causes considered external to the agent and/or uncontrollable inspire more frequent feelings of closeness and sympathy (therefore, collaborative/help behaviors); on the contrary, causes perceived as internal to the agent and/or controllable by him support the idea of his responsibility in the situation and arouse anger and aggressive/avoiding behaviors. Focusing on the link between the attribution of responsibility and helping behaviors, Weiner noted that people are less likely to help a person in difficulty if she is judged to be responsible for the situation she is in (see Attribution-Responsibility-Support Model. Weiner, 1995; Jeong, 2010). Weiner's model is appropriate in many contexts: In the case of attitudes towards poverty, for example, believing that a poor person is not to be held responsible for her condition but, say, attributing her that to situational aspects (external and uncontrollable, such as scarce employment opportunities), will elicit a much greater inclination to support than if the individual is blamed for his condition (Bradshaw, 2007; Norcia *et al.*, 2015).

At an intrapersonal level, that is, when the observer and the agent are the same people, if the attribution of an unpleasant event is to internal but uncontrollable causes ("It is my fault and I cannot do anything to avoid it.") most frequently feelings of shame are triggered. In addition, if the cause of the event is perceived as stable ("What happened is my fault and I cannot do anything to avoid it, now or in the future."), the sense of helplessness and resignation becomes even greater and, consequently, withdrawal is more likely to occur (Coffee *et al.*, 2009). As in a vicious circle, personal self-efficacy will suffer, while the future expectation of uncontrollability will increase the sense of helplessness (Abramson *et al.*, 1978). The behavioral outcome, on the other hand, seems to be the opposite if the underlying cause of the failure is always perceived as internal but controllable: In this case, the sense of guilt for an outcome that "should" and "could" be avoided, associated with the desire to remedy, fosters an increased commitment toward the result (Hareli and Hess, 2008; Graham, 2020).

The relevance of studying causal explanations, especially considering their behavioral implications, strongly emerges when it comes to health. Numerous studies show that health issues, characterized by threat and uncertainty, inevitably stimulate in people a search for the cause that shapes their behavior in the health-disease continuum, that is, from a preventive or treatment point of view (Taylor *et al.*, 1984; Michela and Wood, 1986; Roesch and Weiner, 2001). For example, the perceived level of control over the causes of disease appears to influence the patient's compliance with preventive behaviors (like vaccination or wearing face masks), therapeutic regimens, and the

number of relapses (Cooper *et al.*, 1999; Weinman *et al.*, 2000; Niederdeppe, 2007; Mo and Lau, 2015). Several studies have found that precautionary behaviors, such as not smoking, regular physical exercise, and dental health, are more common among individuals with strong internal beliefs (Strickland, 1978; Norman *et al.*, 1997; Macgregor *et al.*, 1997). On the contrary, attributing illness to chance (fate but also genetic factors and environmental determinants beyond an individual's control) is often associated with health-related behaviors such as exercise, alcohol consumption, breakfast, fruit intake, fiber intake, and fat avoidance (Callaghan, 1998; Duffy, 1997; Steptoe and Wardle, 2001). The attributive dimensions on the onset of the disease even seem to condition the attitude of healthcare personnel towards patients. Similarly to what happens in the case of helping behaviors in general, the perception of the individual's responsibility regarding the onset and management of the disease can influence the assistance given by doctors and nurses (Meyer and Mulherin, 1980; Marteau and Riordan, 1992; Weiner, 1995; Ogden and Knight, 1995).

When specifically talking about globally widespread health threats, literature has highlighted significant relations between causal explanations for the etiology of the illness and subsequent affective or behavioral outcomes. In broad terms, the framework seems to be quite the same as for other topics, being internal attributions associated with healthy behaviors more frequently than external attributions. Internal explanations indeed have been found to be related to greater use of preventive behaviors, like vaccinating, wearing face masks, or washing hands, but mainly when fear of infection is extensively present (Karademas *et al.*, 2013; Lau *et al.*, 2010). Also, in the case of other threats to health, such as Invasive Pneumococcal Diseases (IPD), considering that they can be controlled by existing treatments is significantly associated with the uptake of vaccination (Wang *et al.*, 2021). Conversely, Mo and Lau (2015), reporting the results of their study on causal attributions and the H1N1 pandemic, suggested that when internal causations involve emotions like anger or depressive mood, people are less likely to adopt preventive behaviors.

On the other hand, when a health crisis is considered as outside the individuals' control (because, for instance, it is attributed to an already-written fate), non-control attributions frequently occur, which have been found to be negatively associated with preventive health behaviors (such as vaccinating) (Olagoke *et al.*, 2021).

It is interesting to note that, in some African societies, people's classification of the cause of the pandemic illness (such as malaria, flu, or diabetes) may lead to different courses of treatment. 'Normal illness or 'illness of God' (which are considered part of normal human life) are mostly treated through 'biomedical medicine' or 'white man's medicine'. For 'out of order illness' or 'abnormal illness', on

the other hand, which are believed to be caused by witchcraft and spirits, people often turn to traditional healers (Tshabalala and Gill, 1997; Muela *et al.*, 2000; Nguma, 2010).

In view of the impact of attributive dimensions on behavior in general and on health behaviors in particular, also considering pandemic threats, the study presented in this article has the objective of collecting causal attribution made by people for possible infection by Coronavirus SARS-CoV-2, placing special emphasis on the causal dimension of the attribution made, i.e., Locus, Controllability, and Stability. The study aims to preliminarily explore if people favor specific attributions to the detriment of other ones and to ascertain possible relations between the socio-demographic characteristics of the respondents and the causes they chose. These aims possibly affect both theoretical advancements and applicative implications, since they also intend to provide some suggestions for the design and implementation of interventions.

Materials and Methods

Research Tool

An *ad hoc*, semi-structured questionnaire was prepared for data collection. It consisted of sixteen questions placed in the following areas.

Socio-demographic area.

The area on social representations of a pandemic: Moving from the concept of representation proposed by Moscovici (1981), the respondent was asked to indicate the first three words that came to mind when thinking of the term "Coronavirus" and to briefly explain their meaning.

The area of causal attributions: Data presented in this study come from this area. Thirteen possible causes of contagion were randomly presented to the participants. Causes were defined based on attributive dimensionality and hence were distinguished in terms of internality/externality, controllability/uncontrollability, and stability/instability. This area was built starting from a review of the literature on attributions and according to the results of a short Preliminary qualitative Study (PS) in which the participants (about 100) were asked to identify the possible causes of contagion, in their opinion, for a generic person. The responses were then categorized independently by two researchers (psychologists) and differentiated according to the causal dimensions. Subsequently, the researchers discussed upon their respective categorization, reaching a shared list of 13 causes.

The multiple-choice introductory question was: Why today, in Italy, does a person run the risk of becoming infected with the SARS-CoV-2 Coronavirus? Respondents were then asked to choose which attribution best fitted their perception.

The 13 possible causes of contagion presented to the participants were:

- Because she did not comply with the preventive behaviors (PERSBEH)
- Because other people did not comply with the preventive behaviors (OTHBEH)
- Because our decision-makers (at the national or local level) have approached the issue with superficiality (DMBEH)
- Because the information that comes from our decision-makers (at a national or local level) is unreliable because it is approximate or conflicting (BADINFO)
- It's a matter of destiny (DEST)
- Because she is sickly (PERSHEA)
- It's because God loves her (GLOVE)
- It's a matter of bad luck (BADLUCK)
- It's God's plan (GPLAN)
- Because it is a very aggressive, contagious virus (VIRCAR)
- The issue has been badly handled by the countries where the epidemic originated (CORIG)
- Our health system is not adequate (BHCSYS)
- God is punishing this person for her sins (GPUN)

Sample and Administration

The sample consisted of 575 participants which were contacted via email and social media. Participants were recruited by using snowball sampling. This sampling technique was chosen due to the exploratory nature of this study and the possibility of reaching participants with certain characteristics of interest for the overall study. Based on this type of sampling, the selection of the first group of participants was based both on the researchers' knowledge of key respondents, according to the main objectives of the study, (physicians, religious ministers, etc.), and on their network of acquaintances. Initial seed respondents recruited additional participants from their networks of acquaintances, thereby forming further referral chains.

The administration of the questionnaire took place between 13 and 27 April 2020. The researchers presented the questionnaire to the respondents using the CASI technique and the Google Forms platform. The questionnaire was anonymous and completing it took an average of 10 min.

Data Preparation and Data Analysis

Based on the suggestions from the literature (for a comprehensive dimension taxonomy see e.g., Roesch and Weiner, 2001) and on the attributions made by participants in the Preliminary qualitative Study (PS), the following clustering of different causal explanations into dimensional categories has been adopted. The first demarcation line across our set of causal explanations is

between a person's behavior (PERSBEH) and characteristics (PERSHEA), which are always considered internal and everything else (e.g., others' actions, social circumstances or supernatural causalities) which is fundamentally external (Lunt, 1991). In terms of stability, specific behaviors, either person's or others, can be reasonably considered unstable (Weiner, 2010). As for this study, this could refer to the actions adopted concerning the pandemic that is personal or other's preventive behaviors (PERSBEH and OTHBEH, respectively) and management of the situation at the political or media-level (DMBEH, CORIG, BADINFO). Personal permanent or long-lasting characteristics (such as ability or being sickly - PERSHEA), on the contrary, can be properly placed in the stable explanations' cluster (ivi). Similarly, characteristics of the SARS-CoV2 virus (such as its aggressiveness or contagiousness) (VIRCAR), being its permanent genetic traits, can be deemed external, stable, and uncontrollable (as if viruses were ever capable of controlling their actions). When bad luck (BADLUCK) is considered episodic (and not as a kind of stable quality, such as being a "lucky person"), it can be considered an external, unstable, and uncontrollable factor (Lunt, 1991; Weiner, 2010; Smith and Worth, 2019). Coming to examine transcendent attributions, they were mainly identified with God by the PS participants. Mallery *et al.* (2000) observes that in the case of "pure" transcendent explanations (i.e., excluding mixed causes such as ones perceived as controllable by a divine entity even if located in the environment) they can be included in the group of external and controllable attributions: Reasonably, if the cause is perceived to be located in the divine entity, she is supposed to have control over it. As for stability, Hovemyr (1998) found that God's intervention-also when it is in response to an individual's action (i.e., prayers) - is considered stable, mostly from those who are high in intrinsic religiousness. In this circumstance, perception of stability could originate from perceived coherence of behavior across time and situations displayed by God, also when it is elicited by an individual's acts (such as his prayers or his sins).

Accordingly, the following dimension taxonomy was adopted (Table 1).

Two cells of Table 1 (internal/uncontrollable/unstable causes and internal/controllable/stable ones) are empty. This is because the PS participants have not mentioned the attributions which were expected to be included in both the empty cells and taking into account suggestions from the PS was of primary importance, also considering the purposely "grounded" basis of the list of attributions proposed in the final questionnaire. Also considering suggestions from the literature, it could be speculated that the reason why PS participants didn't choose those kinds of attributions is that such explanations were perceived as not fitting properly with the very nature of an event such as a possible contagion. In fact, in the first group of attributions causes can be encompassed such as mood or personal interests (Weiner, 1979; Anderson, 1983; Vakani *et al.*, 2012) both causes having conceptually no relevance for an event like becoming infected. Then, internal/controllable/stable causes – the attributions to be included in the second empty cell - mostly refer to successful performances, either in academics, in sports, or health behaviors (Russell *et al.*, 1987; Brière and Vallerand, 1990; Pedersen and Manning, 2004; Schoeneman and Curry, 2010; Mkumbo and Amani, 2012). Also, in this case, the nature of the cue event (contagion) makes unfitting this kind of attributions, being these most related to positive experiences.

As a preliminary data pre-processing step, respondents were grouped according to their ages and their education level. Five age groups have been defined: Up to 28 years, 29-39 years, 40-50 years, 51-61 years, and 62+ years. Age groups were defined post-hoc to maximize significance for between-group comparisons while also maintaining a meaningful separation between groups. Also, for education level, people were grouped into classes. The elementary and lower secondary school qualifications (age 6-13 years) constituted the first group; the high school qualification (age 14-19) constituted the second group; the degree and post-degree were inserted in the third group.

As for the statistical analysis, descriptive statistics (e.g., frequency counts and percentages) were calculated for each item for the total sample. The authors then conducted chi-square analyses to explore possible differences in attribution made among the various subgroups. An alpha level of 0.05 was set for each series of chi-square analyses. Some respondents did not answer all questions. To avoid the risk of biasing the dataset and to better ensure a sufficient quality of the analyses, the incomplete answers were deleted using listwise deletion. Data were analyzed using IBM SPSS.

Table 1: Clustering of the items into causal dimensions

	Internal locus		External locus	
	Stable	Unstable	Stable	Unstable
Controllable		PERSBEH	BHCSYS GPLAN GLOVE GPUN	OTHBEH BADINFO DMBEH CORIG
Uncontrollable	PERSHEA		VIRCAR DEST	BADLUCK

Results

The sample was composed of 61% women and the average age was 46 years (M = 46 years, range = 18-78 years, SD = 12.5 years). As for education, the most represented groups of respondents were degree and post-degree (43.3%) and high school qualification (31.5%). 79.7% of the interviewees feel attached to a religion.

Table 2 shows the causes chosen by the respondents. Respondents mostly attribute the responsibility for a possible infection to the virus and its characteristics (VIRCAR), such as, for example, its contagiousness. The second most chosen cause refers to the behavior of the individual (PERSBEH), but the percentage resulted to be far lower than the first attribution.

Taken together, these two causal explanations have been chosen almost 7 times out of 10 and, also considering that other presented causes have been chosen around 1 time over 20 each, this sharp result further stands out. In the first case, the cause identified is external to the person (external locus), it cannot be voluntarily controlled and produces its effects stably over time. In the second case, on the contrary, the cause is internal to the person (her behavior), the agent can directly influence the event and the cause can change from one situation to another (variant, unstable over time).

As regards the causal dimensions (see Table 3), external causes were chosen to the greatest extent (over 80% of preferences). Among these, chosen causes were stable and uncontrollable in 56,7% of cases and unstable and controllable in 20,8% of cases. In the first case, the attributions relating to the virus and its characteristics (VIRCAR) and Destiny (DEST) are included. The second group of attributions includes the non-prudent behavior of other people (OTHBEH), the perceived reliability of the information about the pandemic (from experts, politicians, media. BADINFO), the counter actions taken by politicians and technicians in Italy (at the national or local level. DMBEH) and in the countries where the epidemic originated (CORIG).

Socio-Demographic Characteristics of the Sample and Causal Dimensions

Gender of the Respondents

There seems to be no relationship between the respondent's gender and causal dimensions. The responses of males and females do not differ significantly either for locus (n=561. χ^2=,026; p=,482) for stability (n=561. χ^2=,428; p=,289) or for controllability (n=561. χ^2=,644; p=,240). Also considering the attributive dimensions as a whole, results show a substantial absence of difference.

Age of the Respondents

As for age, the results revealed significant differences in the case of all three causal dimensions. The younger respondents (up to 28 years of age) mostly chose internal, unstable, and controllable attributions. Older respondents, on the contrary, seem to prefer external, stable, and uncontrollable causes (n=561; χ^2=30.328; p<,001 for Locus. χ^2=24.373; p<,001 for Stability. χ^2=16.084; p=,003 for Controllability). As for the attributive dimensions as a whole, they seem to significantly diversify the different age groups (n=561. χ^2=50.616; p<.001). The most frequent attributions (over 80%) differentiate the younger group (under 28 years), who seem to prefer unstable and controllable causes, both internal and external (PERSBEH, GPUN, and OTHBEH, DMBEH, BADINFO, and CORIG). Older respondents seem to prefer external, stable, and uncontrollable causes (VIRCAR and DEST).

Table 2: Sars-Cov-2 infection and causal attributions

	Frequency	Valid percentage
VIRCAR | Virus' characteristics	316	56,3
PERSBEH | Behavior of the agent	72	12,8
CORIG | Choices made by the country in which the outbreak began	39	7,0
DMBEH | Decision makers' choices	34	6,1
OTHBEH | Others' behavior	32	5,7
BHCSYS | Inadequate health system	31	5,5
PERSHEA | Agent's health condition	14	2,5
BADINFO | Bad quality information	11	2,0
BADLUCK | Bad Luck	7	1,2
DEST | Destiny	2	0,4
GPLAN | God's plan	2	0,4
GPUN | God's punishment	1	0,2
GLOVE | God's love	0	0
Total	561	100
Missing	14	
Total	575	

Table 3: Sars-Cov-2 infection and causal dimensions

		Frequency	Valid percentage
	External - Stable - Uncontrollable	318	56,7
	External - Unstable - Controllable	116	20,8
	Internal - Unstable - Controllable	72	12,8
	External – Stable - Controllable	34	6,1
	Internal - Stable - Uncontrollable	14	2,5
	External - Unstable - Uncontrollable	7	1,2
	Total	561	100
Missing	999	14	
Total	575		

Education Level of the Respondents

As regards education level, analyses showed that people belonging to the first two groups more frequently chose internal unstable and uncontrollable, unlike respondents with a degree or higher qualification (n=542. χ^2=9,432; p=,009 for locus; χ^2=13.039; p<,001 for stability; χ^2=14.405; p<,001 for controllability). As regards the attributive dimensions considered as a whole, also in this case significant differences emerged (n=542. χ^2=30.126; p<,001). The only exception emerges for people belonging to the first group who, as for Locus, do not differ substantially between those who chose internal or external causes. People with a high school qualification or less seem to prefer external, unstable, and controllable causes (OTHBEH, DMBEH, BADINFO, and CORIG). Most educated respondents, on the other hand, seem to endorse still external causes but stable and uncontrollable ones (VIRCAR and DEST). Finally, medium-educated people seem to show a preference for internal, unstable but controllable causes (PERSBEH, GPUN).

Discussion

Results show that external causes which are also stable over time and uncontrollable are the most frequent choices for a possible contagion, mainly for older and more educated respondents. The second option, in order of frequency, concerns external, unstable, and controllable causes and it was mostly chosen by young people (up to almost 30 years old) whose maximum level of education is a high school qualification. Nevertheless, this option was selected by less than half the number of people who chose the first category of attributions, further highlighting the huge gap between this category and the others.

The strong preference for external causes could suggest some explanatory hypotheses.

The first hypothesis deals with the self-protective function carried out by externalization of the cause of a negative event, which reassures the person about the (im-)possibility of intervening and thereby relieves her from the burden of responsibility. In a situation such as the worldwide COVID-19 pandemic, such a mechanism can be functional to mitigate the effects of the strong uncertainty for one's fate and that of other people subject to a possible infection (See the "Collective angst", Wohl *et al.*, 2012; Tabri *et al.*, 2020). In this regard-and here we come to the second hypothesis - it should be considered how much, presumably, the state of deep apprehension was also fueled by the strong presence of the "pandemic" theme on the media (both "new" and traditional) and had, in turn, exponentially increased the request for related contents: In the weeks immediately preceding the data collection of this study, the use of 24-h news channels almost tripled and the word "coronavirus" was found to be the most searched on Google (GFK, 2020; Google, 2020). The strong interest in the issues related to this pandemic seems to have embraced these different aspects: In addition to focusing people's attention on the "virus" theme-as, a content-it certainly had the effect of increasing feelings of uncertainty and anxiety (Van den Broucke, 2020). A sort of vicious circle that could have prompted a reassuring departure from the "contagion" issue and its causes.

Additional interesting aspects concern instability and uncontrollability, that is the two further dimensions that characterize the attribution most chosen by the respondents. Considering the practical objectives of this study, it appears important to focus attention on the impact of these dimensions on aspects that can affect behavior toward contagion (prevention, treatment). One of the main aspects concerns learned helplessness, which is the psychological state that results when an individual who perceives himself as unable to exercise effective mastery in one situation, consequently assumes that he is then unable to exercise effective control in other similar situations. As for health, individuals may assume that no preventive behavior or treatment intervention can be of assistance. In the case of the subject of this study, learned helplessness could be prompted by the perception of the impossibility of intervening in such a significant threat, such as being infected, because it is out of individual control and protracted over time (because it is stable) (Munton, 1985).

Scientific literature shows how the perception of a little impact on reality, especially if repeated, influences behaviors, including health behaviors, at cognitive, affective, and motivational levels (Overmier and Seligman, 1967): At a cognitive level, for example, a gap

may appear between an individual's confidence in a piece of information and its real accuracy (Knowledge Miscalibration see Alba and Hutchinson, 2000; Hansen and Thomsen, 2013), as well as anxiety and depression at the affective level (Underwood, 1992); on a motivational level, the perception of impotence can instead shape health behaviors by determining, for example, a lower conviction in adopting prevention, such as screening behaviors (Perez-Stable *et al*., 1992; Michielutte *et al*., 1996; Powe, 1995). On the contrary, the motivation of people to adopt virtuous health behaviors inevitably passes through the perception of their own ability to successfully put them into practice and from the certainty of their real effectiveness, as also confirmed by various theoretical models (see Champion and Skinner's Health Belief Model and Prentice-Dunn and Rogers' Protection Motivation Theory. Van den Broucke, 2020).

Conclusion

Despite the exploratory nature of this study, some findings may be potentially useful both for theoretical advancement and for their possible practical implications: Reflecting on the emotional and behavioral consequences related to causal explanations regarding a significant event such as the SARS-Cov-2 pandemic can indeed improve the effectiveness of interventions to reduce contagion (Sanders *et al*., 2020).

The most problematic issue seems to be related to the level of perceived control over this health threat that, in and of itself, elicited a big amount of fear and anxiety. The main cause of the pandemic chosen by respondents is perceived as external, people don't think to be able to control it and they think it is stable over time: "*I don't have any chance to cope with this nightmarish and long-lasting thing!*". It seems reasonable that, to reduce feelings of anxiety, it would be useful to set interventions focused on enhancing the perception of being able to properly manage this threat. A broad reflection on the quality of the information provided to citizens may constitute a relevant cut of this issue and is related to the frequent ambiguity, vagueness, and discordance of messages (explicit or implicit) which are spread, often due to the excessive plurality of voices to which space is given. It pays to remember that, initially, even several Italian politicians portrayed COVID-19 as the normal flu, hence not adequately warning against contagious behaviors. Also, the huge amount of information ("Tsunami of information". Zarocostas, 2020, p. 676; Krawczyk *et al*., 2021) may have hindered people's regular course of information processing and the subsequent attribution of causes to the events. Putting effort into providing fair-quantity communication could help in that it would allow people to better understand, classify, and therefore master available information then lowering fear and anxiety.

To deal with these types of issues, some suggestions could be provided. As a first, quick suggestion, sharing

success stories reveals an effective twofold tool to increase people's perception of control over this health threat. Success stories potentially increase indeed people's motivation by allowing a kind of upward comparison which may help them to perceive the light at the end of a long tunnel, that is the possibility of reaching that same goal (Day, 2022). However, a caveat that must be kept in mind using his technique is that upward comparison could lead to envy and negatively impact self-esteem. On the other hand, they help people reduce misperception of the reliability of official information and the overweight of private ones and thus allowing a more coherent perception of what they can and cannot control better by a better balance between reality and expectation.

Then, a more comprehensive strategy is suggested in which trusted community agents such as politicians, technicians, and healthcare providers strictly cooperate with social media managers and media technicians. This strategy should focus on sharing advice, guidelines, and information, quickly conveying urgent information, and accurately selecting essential ones, while simultaneously tempering untoward media overexposure. In particular, three possible intervention pathways, described below, could arise within this background.

First, an accurate and timely information demand analysis may be suggested, possibly using AI, to properly intercept changeable people's need for information. Customized demand satisfaction would favor noticeable benefits such as enhancing people's trust in community agencies as reliable sources of crisis information. A greater effort in this task would carry some significant benefits, while necessarily being aware of the risk of the spread of *mis*information (Koulolias *et al*., 2018), with the pejorative prefix "mis" to indicate bad quality information, contradictory information, or overabundant information. Indeed - and we come to the second point - adopting measures to effectively stem the wave of misinformation, that is ambiguous and incoherent information which widely spread through media, would help to reduce feelings of uncontrollability and anxiety which could presumably undermine the information processing (Garfin *et al*., 2020). This is undoubtedly more so when facing an invisible threat, such as a virus.

Last, information management which promotes and enhances the dialogic loop (Seltzer and Mitrook, 2007) shared decision-making and mutual understanding will improve people's engagement and their willingness to actively share and respond to content posted by community agencies. Also, empowerment is improved both by promoting participation and by allowing people to solve problems collaboratively due to the formidable capacity of the inter-connectivity of social media.

Social media could play a unique role in this framework since their impact on the population's health knowledge and behavior. As emerged in various health

emergencies and other natural catastrophes, social media widen people's access to information on a wide range of health issues, regardless of their education, age, race, or ethnicity (Velasco *et al.*, 2014; Giustini *et al.*, 2018; Freberg *et al.* 2013). Although many health regulatory agencies already use social media platforms individually to achieve monitoring, protect, and improve the health of people, often they tend to consider this kind of media just as a complementary channel for e-disclosure (Neely and Collins, 2018), rather than a tool to promote citizen-government collaboration and engagement. It seems important then to further strengthen cooperation between community agencies and social media, to exploit their ability to often outperform official channels in spreading information, particularly in promptness (Al-Dmour, 2020; Carter, 2014), and to allow people to share their experiences and peer-to-peer discuss in a way not enabled by traditional websites.

Study Limitations

This exploratory study intended to offer insight into the causal explanations regarding the possible infection from SARS-CoV-2. The adopted theoretical perspective represents a well-defined field of interest but this also poses some intrinsic limitations. Enriching the study from a conceptual point of view, for example including a reflection on attributive styles, would lead to a more complex analysis, hence positively affecting the accuracy of the conclusions. For example, considering attributions to God, the divine entity's love is unconditional whereas her plan is already established. The only exception could be when a divine entity's acts are perceived in response to people's behavior, such as their sins: People could consequently consider sharing control of the cause. Further limitations concern the sampling method-snowball-and the composition of the sample. In addition to the intrinsic limitations in terms of representativeness, the sample often results to be fairly homogeneous because initially recruited subjects tend to refer to demographically similar people (Sadler *et al.*, 2010). In this study it concerned, for example, with the qualification of the participants. Similarly, it would be appropriate to reflect on other characteristics of the sample, due to a possible over-representation of those participants who have numerous social contacts (also considering the most used channels for recruitment, i.e., emails, messaging services, and the main social networks).

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Author's Contributions

All authors equally contributed to this study.

Ethics

This article is original and contains unpublished material. All of the other authors have read and approved the manuscript. This article contains study with human participants. All procedures performed in this study were in accordance with APA's ethical standards since participants were informed about the purposes of the research, expected duration and procedures of answering the questionnaire. All the participants were also informed about the right to stop the compilation at any time at will and about guarantees for confidentiality. Participants were also allowed to contact authors for any questions.

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