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SUSTAINABILITY AND ECOLOGICAL TRANSITION IN THE POST-COVID ERA

Challenges and Opportunities
in the Face of Climate Change
and Energy Transition

Ricardo García-Mira
Petra Schweizer-Ries
Cristina García-Fontán
(Editors)



In recent years we have seen the need for changes emerge in the global context from both the social and ecological point of view. More recently, over the last three years, the Covid19 crisis and the climate change with which it is related, through the breakdown of the natural barriers that separate us from other species, is an example that we can go further from this return point and placing ourselves in a context of maximum interest. What is happening with this, therefore, does not take us by surprise, considering that we can clearly identify its anthropocentric origin and how it is related to climate change, from the alterations that human beings have caused in the cycle of ecosystems that maintain equilibrium at the planetary level.

Psychology has taught us that there is no single point of view, and that different theories explain the paralysis of society in the face of the urgency of undertaking effective and efficient climate action. On the other hand, different interests coexist in interaction within a social system. Manufacturers and producers observe nature with different perspectives than users, conservers and consumers, who, in turn, differ in different identities and ideologies, some oriented to act on the improvement of clean production, while others are more focused on reducing the impact by transforming consumption. Some organizations and social movements are oriented towards green production, while others call attention to the need to reduce demand, to go with de-growth. Development and growth, therefore, have occupied different positions in the public debate.

Meanwhile, whoever one has to define the policies that mark the trajectory to follow, in one direction or another, define guardrails to build a regulatory system with sustainability governance and broad participation. The development model has to be sustainable, regenerative and healthy and generate global ideas and values that permeate education and the social system with ethics, convictions and common objectives, which are authentic reference points of respect for planetary boundaries. In this context, the energy transition must begin by understanding what a transition is and why the way in which energy is managed is important within that transition. Generating interdisciplinary knowledge about this is important to be able to design a de-coupling plan to the different economic, technological, ecological, cultural and social ingredients of this transition of the whole system.

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Xoan Vicente Viqueira

Institute for Psychosocial Studies and Research

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13 / THE COVID-19 PANDEMIC'S IMPACT ON ENVIRONMENTAL ATTITUDES

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ABSTRACT

Although COVID-19 has illustrated the human impact on the environment, it is also true that immediate needs (such as the ones provoked by the economic crisis that paralleled the COVID-19 health crisis) may endanger the importance people gives to sustainability. Generally, attitudes towards the environment are high, and several studies have proven that people are concerned about climate change and seem willing to take steps to stop it. Nevertheless, it is also true that the frame or the accessible information at different moments can affect the attitudes towards several issues. This paper examines the following question: has the pandemic provided an opportunity to strengthen pro-environmental attitudes or will it put environmentalism at risk?

We designed an experimental study to explore whether thinking about the COVID-19 pandemic affects people's environmental attitudes. A total of 411 people participated in our research (60% women; mean age of 42.03; SD = 14.06). The experimental design was a 2 (priming the pandemic vs. non-priming the pandemic) × 2 (valence of the priming: positive consequences vs. negative consequences). After asking participants to answer the open question mentioned above and elaborate on their responses, they answered several questions about their environmental attitudes, including towards climate change and the public policies to mitigate it.

Our results show that there were no differences in the priming factor (priming vs. non-priming the pandemic). However, the valence of the prime (positive or negative) had an effect on attitudes towards public policies to mitigate climate change. The results also show an interaction effect between the two conditions for the attitudes towards climate change. Those who expressed positive consequences in the non-priming

pandemic condition scored higher in attitudes towards climate change than those who expressed negative consequences. However, this valence effect did not occur when participants expressed their thoughts about the pandemic.

These results show that the information that is given to people before asking them about their environmental attitudes may influence the attitudes they express towards environmentalism. Contrary to what was expected, negative thoughts about the pandemic (e.g., about its economic or health negative impacts) had no effect on climate change attitudes. However, the valence (positive or negative) of the priming exerts an effect that needs to be considered when designing campaigns to implement climate change public policies

Keywords: COVID-19 pandemic, environmental attitudes, accessibility, climate change, experiment.

1. INTRODUCTION

The health impact of the COVID-19 pandemic is well-known: the disease has infected millions of people, claimed thousands of lives and sent most of the world's population into lockdowns at various times. However, as countries around the world implemented these lockdowns due to the terrible threat of the coronavirus crisis, the environment breathed a sigh of relief. The COVID-19 pandemic had some direct, short-term and positive effects on our environment, especially in reducing emissions and improving air quality. According to a global survey conducted by experts, which was published in Nature Climate Change, daily CO₂ emissions have dropped by 17% worldwide. This report also anticipates that 2020's annual emissions could be the lowest since the Second World War.

However, the UN's Framework for the Immediate Socio-Economic Response to the COVID-19 Crisis warns that the COVID-19 pandemic is far more than a health crisis: it is affecting societies and economies at their core. According to the International Monetary Fund, the global economy shrunk by 3.5% in 2020, representing the deepest global recession since the Second World War.

Given this scenario, the question now is whether the promises made to combat climate change will be kept now the health crisis appears to be nearing its end with the widespread distribution of vaccines, but the economic regression threatens to interfere with the next steps.

Since the coronavirus disease (COVID-19) outbreak originated in Wuhan, Hubei Province, China, in December 2019, it has become a threat to the health and lives of the world's population. By July 8, 2020, COVID-19 had spread to more than 210 countries worldwide, infecting over 11 million people and causing 539,026 mortalities (World Health Organization, 2020). As COVID-19 is highly transmissible and has a high mortality rate (Hu *et al.*, 2020), countries have taken various precautionary measures, such as large scale COVID-19 screening tests, social distancing, mask-wearing, handwashing and sanitisation (Chen *et al.*, 2020). Moreover, governments worldwide have implemented lockdowns to limit the spread of the virus, which have restricted activities around the world. The COVID-19 pandemic forced people to stay indoors, turning some of the world's busiest places into empty spaces.

Lockdown measures varied in timing and intensity according to the onset of the epidemiological crisis and the evolution of infections in each country. However, on a global scale, it was possible to observe shifts in human mobility patterns resulting from the enforced confinement associated with COVID-19 pandemic lockdowns (Chakraborty & Maity, 2020). The unprecedented reduction in global economic and transport activity resulted in a decrease in the emissions of greenhouse gases and other pollutants, evidencing the anthropogenic impact on air quality (Querol *et al.*, 2021). According to Venter *et al.* (2020), lockdown events reduced the population-weighted concentration of nitrogen dioxide and particulate matter levels by about 60% and 31%, respectively, in 34 countries. Across Europe, average emission reductions were estimated to be about 33% for NO_x, 8% for non-methane volatile organic compounds (NMVOCs), 7% for SO_x and 7% for PM_{2.5} during the most intense period of lockdowns (March 23 to April 26, 2020), with a reduction in road transportation being the largest contributor to total reductions (85% or more) (Guevara, *et al.*, 2021). In countries where the lockdown restrictions were more severe, such as Italy, France and Spain, reductions were even larger (Querol *et al.*, 2021).

These data show that the COVID-19 pandemic had some direct, short-term and positive impacts on the environment. However, this reduction in activity also had an economic effect. The COVID-19 pandemic caused extensive economic upheaval. The world's economies, including stable ones, went into a state of shock (Park *et al.*, 2020). Several reports have analysed how the COVID-19 pandemic has created a widespread economic slowdown and has affected a wide variety of sectors, reflecting the severe and generalised economic and financial downturn caused by the pandemic (Baker *et al.*, 2020; Gopinath, 2020; Nicola *et al.*, 2020). Many people have lost their jobs or seen their incomes cut (Baker *et al.*, 2020; Gopinath, 2020; Nicola *et al.*, 2020). Unemployment rates have increased across major economies (Jones *et al.*, 2021). Millions of workers have also been put on government-supported job retention schemes as parts of the economy, such as tourism and hospitality, have come to a near standstill. Businesses have faced reductions in sales and falling profits. The International

Monetary Fund described the decline as the worst since the Great Depression of the 1930s (Gopinath, 2020).

The COVID-19 pandemic has triggered a global economic recession, but it is uncertain how long the recession will last (United Nations, 2020). Economic recovery will require the collaborative action of governments, policymakers and citizens. However, it is unclear whether these efforts will consider the proven anthropogenic impact on pollution (as the reductions in the lockdowns illustrate) or whether economic recovery will be prioritised over all other factors, including environmental sustainability. The choices countries make now and public support for those choices will have long-term consequences. One must ask whether the COVID-19 crisis will act as an impediment or a catalyst towards increased public support of policies that put the environment, rather than economic growth, at the core of the recovery efforts.

Generally, levels of public concern about environmental issues are high, and several studies have shown that people are concerned about climate change and seem willing to stop it (Portinga *et al.*, 2019). There are, as of yet, few studies on the association between environmental concerns and COVID-19. Still, those that have already been published have found that after the pandemic began, concern about climate change has not diminished, but it has continued to grow (Severo *et al.*, 2020). These studies have found that the COVID-19 pandemic has helped raise awareness about climate change, opening a window of opportunity for action. Further, they have claimed that the pandemic will be a catalyst in the fight against climate change through the introduction of more ambitious public environmental policies.

However, although COVID-19 illustrated the magnitude of the human impact on the environment (Daryanto *et al.*, 2022), it is also true that immediate needs (such as needs related to the economic crisis that has run parallel to the COVID-19 health crisis) may affect the importance citizens place on sustainability and acceptance of public policies in climate change mitigation (Clayton *et al.*, 2015). Climate change mitigation policies are inherently in temporal conflict, as in most cases, protecting long-term interests through environmental action requires the sacrifice of short-term interests (Carni, 2013). Leiserowitz (2005) notes that while a large majority of people consider climate change to be a serious problem, they perceive it as being only a moderate risk that is more likely to affect people and places that are distant in space and time, viewing it as a low priority relative to other immediate issues. In other words, citizens do not prioritise action on climate change, especially when other issues seem more immediately urgent. Although Leiserowitz's (2005) work is somewhat dated, this trend has continued to appear in more recent studies (Ballew *et al.*, 2019). Thus, paradoxically, people seem concerned about climate change, yet view it as less important than more immediate issues.

Finding a possible explanation for this paradox, as recent studies have posited (Langenbach *et al.*, 2020), could be assisted by better understanding the cognitive processes involved in processing policy campaigns in climate change mitigation (Clayton *et al.*, 2015). One possible cognitive mechanism that could assist in understanding this phenomenon is the availability heuristic, which posits that the most accessible information in a judgment situation can affect one's attitudes towards several issues (Kay *et al.*, 2004; Tversky & Kahneman, 1973). The accessibility of the attitude from memory is postulated as a critical determinant of whether the attitude-to-behaviour process is initiated. Accessible attitudes function as psychological frames through which individuals interpret and appraise information (Shen *et al.*, 2004). The more accessible one's attitude is, the more predictive it will be of their subsequent behaviour (Fazio *et al.*, 1989). According to Bruner (1957), accessibility involves 'perceptual readiness' that can produce relevant changes in social perceptions and behavioural choices. Thus, the information that is accessible to a person may affect their subsequent decisions. In this study, our goal is to find out if making accessible COVID-19's positive (e.g., environmental or social cohesion) or the negative outcomes (e.g., economic or health negative impact) would affect public attitudes towards climate change and also those attitudes closer to action as attitudes towards public policies directed at mitigating climate change.

Accessibility can be accomplished through a variety of procedures, such as priming. Priming has been shown to have effects on one's perceptions and behavioural choices by increasing accessibility and influencing relevant choices and perceptions (Kay *et al.*, 2004). Several studies have shown that subtle, even subliminal stimuli can influence social perceptions, decision processes and, to at least some extent, behaviour (e.g., see (Baldwin *et al.*, 1990; Bargh *et al.*, 1996; Bargh *et al.*, 2001; Higgins *et al.*, 1977). To prime manipulations in these sorts of studies, participants are first exposed to certain information (words or images, for example) that appear in various sources (a text, a movie, a song, etc.). In the second step, participants are exposed to another, unrelated task, where reactions (attitudes, behaviours, etc.) to subsequent information are measured and the implicit memory of exposure to the previous task is expected to influence a participant's answer given in the task presented later (Bargh *et al.*, 2001). Although there are different approaches to applying priming, we focus on what is called 'mindset priming' in this work. This type of priming implies active and intentional participation rather than a passive presentation of stimuli (Bargh & Chartrand, 1999). In mindset priming, participants are asked to respond to a task where they have to consciously assess, think and make judgments. According to previous studies, the 'mindsets' that are actively developed in the first task continue to be active and influential in the second task, even though the participants are not aware of this (Gollwitzer *et al.*, 1990).

However, when asking people thinking about a topic, trying to make it more accessible, the valence of the information may also affect their subsequent

decisions. How information is labelled or framed may significantly influence people's judgments and decisions (for a review, see Levin *et al.*, 1998). When a prime is presented to a person, it can profoundly influence their later judgments without their conscious awareness (McElroy & Conrad, 2009; Chen & Bargh, 1999; McConnell & Leibold, 2001). The prime automatically exerts its valence on the later decision process by automatically activating either positive or negative valences, serving as a cue for many important judgments (Slovic *et al.*, 2007) and affecting the opinions a person construct (Druckman, 2001).

Further evidence for the influence of automatic valance information can be found in research examining the selective accessibility model (Mussweiler, 2003). According to this model, one can access knowledge through positive or negative influences on individuals' decisions (Mussweiler & Englich, 2005). Some previous studies have suggested that, compared with information presented neutrally, both positive and negative frames will enhance one's evaluation of an issue; however, the results are mixed in this regard. Some studies have found that participants in a positive framing condition tended to express greater support for the following choices presented than participants in the negative framing condition, like supporting voluntary HPV vaccination (Gesser-Edelsburg *et al.*, 2015), while others have found the opposite (Banks *et al.*, 1995; Homer & Yoon, 1992). Previous research has shown that increasing mortality salience (reminder of their individual mortality) enhances pro-environmental attitudes (Fritsche *et al.*, 2010), so making the negative impact accessible may activate people to respond against it.

Therefore, both how the type of information is primed and also how the valence of the information is framed are important. This can have a heuristic effect on the later decisions that need to be considered.

1.1. Study aims and hypotheses

In this research, we propose an experimental study to test whether the pandemic may offer an opportunity to strengthen or weaken pro-environmental attitudes, depending on how the positive or negative outcomes of the COVID-19 are more or less accessible to citizens. We hypothesise that making information about COVID-19 accessible will affect citizens' environmental attitudes more than making any other information accessible. As a non-priming pandemic condition, we asked participants to thinking about the positive and negative aspects of Twitter to keep the participants as cognitively active as those in the priming pandemic condition. The hypotheses under study are the following:

H0: No changes will be observed between groups in the topic or the valence condition.

H1: Pro-environmental attitudes will be higher among participants in the

COVID-19 priming condition compared to those in the non-priming condition (Twitter).

H2: Pro-environmental attitudes will be higher among participants in the positive valence condition compared to those in the negative valence condition.

H3: There is an interaction effect between the priming and valence conditions. The valence condition will cause scores on environmental attitudes to significantly increase, but only among participants in the COVID-19 priming condition and not those in the non-priming condition.

2. METHODS

2.1. Participants and design

We used a non-probability snowball sampling procedure to select participants. The process generated a final sample of 411 people from Spain (60% women; mean age 42.03; $SD = 14.06$). Following Giner-Sorolla et al.'s (2018) recommendations, we applied the effect-size-sensitivity approach to calculate power, whereby the maximum power obtainable with the available resources is calculated. This analysis was carried out with G*Power software (v.3.1.9.4). We conclude that for our design, this will allow us to detect an effect of $f = .13$ at .80 power and $f = .16$ at .90 power. The experimental design was a 2 (experimental vs control condition: writing about the pandemic vs writing about Twitter) \times 2 (valence of information: positive outcomes vs negative).

2.2. Procedure

Participants were recruited online, as they were required to fill out a questionnaire using the Qualtrics platform on their mobile device or laptop. Participants were randomly assigned to one of the four cells of the study. The study questionnaire consisted of four parts: an introduction, a priming section, a section with a series of questions about environmental attitudes and a final section relating to a manipulation and control questions check and sociodemographic information. Participants took an average of 12 min 30 sec to complete the task.

The present study was performed in accordance with the 1964 Helsinki Declaration and its later amendments as well as the 2016 APA Ethical Principles of Psychologists and Code of Conduct.

The priming section consisted of an open question where participants were randomly assigned to one of the four priming conditions. In the no pandemic priming condition, people had to express their opinions towards the impact of Twitter (one group was asked to express positive effects, while the other was asked to discuss negative ones). Furthermore, in the pandemic priming

conditions, participants had to express their opinions towards the positive (one group) or the negative (another group) outcomes of the COVID-19 pandemic. The open questions shown that participants in the positive priming pandemic condition referred to the positive outcomes of the pandemic (e.g., environmental and social cohesion impacts and the resignification of the meaning of life) while participants in the negative priming pandemic condition referred to negative outcomes (e.g., deaths, economic turmoil and lockdown-related mental health problems). In the non-priming positive condition, people referred to the positive effects Twitter has had (e.g., spreading information and facilitating more transversal communication). In the non-priming negative condition, participants referred to the negative consequences of this social media site (e.g. anonymity, disrespectful interactions and polarisation).

After answering this open question, where people had to elaborate their responses, participants then answered several questions about their environmental attitudes. One question related to their attitudes towards specific policies related to climate change, while another asked about their attitudes towards climate change. Finally, people had to answer a manipulation check question (to test if the priming had an effect), a question about the personal impact COVID-19 had had on them (to control for the fact that different personal effects from the pandemic could affect the accessibility of the information independently from the priming) and a question about sociodemographic information.

Following the 2x2 design proposed in this study, this study includes 2 priming conditions (priming the pandemic versus non-priming the pandemic) and 2 valence conditions (positive versus negative). These are discussed below.

Priming Conditions

Half of the participants were randomly assigned to one of two conditions: the pandemic priming group or the non-priming pandemic group (Twitter). In the pandemic priming group, participants were required to consider the consequences of the COVID-19 pandemic. In the non-priming pandemic condition group, participants were required to think about consequences stemming from the use of Twitter.

Valence Conditions

Half of the participants were randomly assigned to consider the consequences of the priming (pandemic or Twitter), in positive, and the other half had to discuss the negative consequences.

2.3. Measures

Attitudes towards climate change: Participants were required to answer on a 7-point semantic differential scale to what extent they thought that the

measures to mitigate climate change were: 'very unnecessary-very necessary', 'unimportant-very important', 'non-priority-priority', 'absurd-reasonable', 'idealistic-realistic' ($\alpha = .91$).

Attitudes towards policies: Participants indicated the extent to which they were in favour of or against certain policies in their country (1 = 'totally against' and 7 = 'totally in favour'). The question about the policies was as follows: 'In two years government should: Increase taxes on petroleum products, Subsidize the purchase of electric cars, Increase the road tax on cars that use gasoline or diesel, Prohibit the purchase of less energy-efficient appliances, use public money to subsidize renewable energies, Prioritize European subsidies on measures focused on climate change' ($\alpha = .78$).

Manipulation check: To find out to what point the priming had an effect on the participants' answers to the environmental attitudes questions, we asked participants to answer the following question: 'To what extent have you thought about the crisis caused by COVID-19 to answer the above question on policy measures?' Participants had to answer on a 7-point scale (1 = nothing, 7 = a lot).

Personal effects of COVID-19: To control the degree to which participants' personal experiences with the pandemic may have influenced the accessibility of the information by interacting with the priming effect, we also asked participants to answer questions on a 7-point scale (1 = nothing, 7 = a lot). We asked to what extent did they consider the COVID-19 crisis to have affected them personally, considering five statements: 'COVID-19 has affected me personally', 'COVID-19 has affected a family member or [a person I am close with]', 'The health crisis has had an effect on my mental and/or physical health', 'The health crisis has had consequences on my work situation', and 'The health crisis has had a negative impact on my income level' ($\alpha = .74$).

3. RESULTS

In examining the results, we first needed to confirm that the priming had had the expected accessibility effect on the participants. The results of the manipulation check showed that there were differences between the priming and non-priming conditions. Those who were asked to think about the pandemic during the priming phase expressed that this had influenced their attitudes towards public policies; this is in contrast to the non-priming group, who had considered a more neutral topic ($t = 5.96, p < 0.01$).

We also needed to control for the possibility that the responses in environmental attitudes were influenced by the priming manipulation and not because of the personal effects of the pandemic. There were no differences among the participants in the four condition groups based on the personal effects of the crisis ($F = 0.19, p = 0.902$).

Once we completed these checks, we continued analysing differences in environmental attitudes between the conditions. First, it is important to note the high scores registered in all the groups. The MANOVA results showed that the priming factor had no main effects on the participants' attitudes towards climate change ($F = 0.01$, $p = 0.923$, $\eta^2 = \mathbf{0.001}$) nor on their attitudes towards public policies ($F = 2.29$, $p = 0.131$, $\eta^2 = \mathbf{0.006}$). In the case of the valence factor, there was a main effect on the participants' attitudes towards public policies, being higher for the positive valence factor ($F = 8.042$, $p = 0.005$, $\eta^2 = \mathbf{.022}$). However, no differences were found in participants' attitudes towards climate change ($F = 0.585$, $p = 0.445$, $\eta^2 = \mathbf{.002}$). There was a significant interaction effect with respect to the participants' attitudes towards climate change ($F = 4.30$, $p = 0.039$, $\eta^2 = \mathbf{.012}$) but not for their attitudes towards public policies ($F = 0.740$, $p = 0.390$, $\eta^2 = \mathbf{.002}$). This interaction is illustrated in *Figure 1*. The participants in the negative valence non-priming pandemic condition scored lowest (i.e., expressed the most negative) attitudes towards climate change, while participants in the positive non-priming pandemic condition scored the highest in their attitudes towards climate change. Contrary to our hypothesis, in the pandemic priming condition, those who expressed more positive attitudes towards climate change were those participants in the negative valence condition.

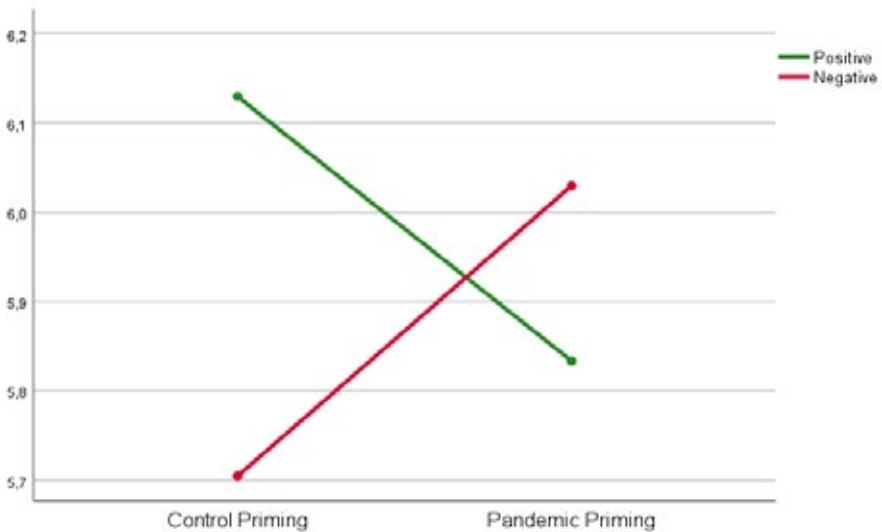


Figure 1. Interaction effect with respect to attitudes towards climate change.

4. DISCUSSION

This study aimed to find out if considering the consequences of the COVID-19 pandemic would have a positive or negative effect on one's attitudes towards climate change. To do so, we tested whether making information about the consequences (either positive or negative) of COVID-19 accessible to

participants would affect their environmental attitudes and compared that to situations where we made other information accessible instead. We expected that considering the positive consequences of the pandemic (e.g., providing clear evidence of the anthropogenic impact on the environment) would boost the participants' environmental attitudes. In addition, we expected that the economic impact of the pandemic (the negative consequence) would weaken participants' environmental attitudes.

Contrary to expectations, thinking about the pandemic had no effect on environmental attitudes (nor attitudes about climate change or public policies to address it). It appears that both participants in the non-priming pandemic condition (Twitter) and the priming pandemic condition had similarly high scores. Therefore, although the manipulation was successful in making participants think about the pandemic while answering questions about environmental attitudes, this had no differential effect when compared to those who thought about other topics. There was, however, an effect when considering the valence regarding the topics. According to our results, thinking positive or negative affects one's later decisions, at least when considering public policy. Participants who were asked to discuss the topics' positive consequences expressed more positive attitudes towards public policy to address climate change than those who were asked to think about the negative aspects in both topic conditions. However, while this is the case for public policy, the results for the attitudes towards climate change are slightly different. In this particular scenario, there is a significant interaction. Those in the positive non-priming condition expressed more positive attitudes towards climate change, while those who examined the negative aspects of Twitter (non-priming condition) scored the lowest. However, for participants in both the positive and negative COVID-19 priming condition (participants who thought about the consequences of the pandemic), the results were similar. In other words, when participants considered the pandemic, valence did not appear to have an effect.

This research confirms what has previously been found about environmental attitudes during the pandemic (Severo *et al.*, 2020). Citizens have positive attitudes towards taking actions to mitigate climate change, even considering the immediate necessity of confronting the pandemic. The sustainability discourse has become commonplace in many areas of society and it appears the population is open to these discussions (Portinga *et al.*, 2019). Our results also show that the valence of priming affects one's attitudes. At least with respect to attitudes towards public policies, thinking positively promotes better attitudes towards and greater acceptance of these policies.

However, the interaction results suggest the need to consider this affirmation carefully in applying these results to attitudes about climate change. In keeping with the results of previous studies (Yao & Wang, 2013), the results in our study also depended on the topic that was primed. When participants were asked to

think about the positive aspects of Twitter, this appeared to have a positive effect on their attitudes towards climate change responses. However, when thinking of the negative consequences of the pandemic, this appeared to increase concern about climate change attitudes when considering the pandemic.

This effect needs to be explored in the future. In this study, those in the non-priming pandemic condition tended to express greater support, which is consistent with other studies that have found this effect in other contexts like supporting voluntary HPV vaccination (Gesser-Edelsburg *et al.*, 2015). However, the negative priming pandemic condition reversed the valence effect, increasing concern about climate change. Previous research has shown that increasing the accessibility of negative impacts (for instance, mortality salience) enhances pro-environmental attitudes (Fritsche *et al.*, 2010). This may help explain why participants who were asked to consider the negative consequences of COVID-19 expressed more pro-environmental attitudes, especially among those who attributed the spread of COVID-19 – at least in part – to environmental misbehaviour, as many have argued (Ali *et al.*, 2021; Daryanto *et al.*, 2022; Severo *et al.*, 2020).

Finally, we need to recognise certain limitations of this study. Considering that this is a preliminary study, these results need to be considered cautiously, and they offer only an initial approximation on the topic. First, the high levels of environmentalism we discovered among participants may lead us towards the well-known social desirability bias (Crowne & Marlowe, 1960), which is very common among studies of attitudes about environmentalism (Vesely & Klöckner, 2020). Second, the study relied on snowball sampling to test this exploratory hypothesis. There is a need to replicate these results in a more representative sample and in different contexts. In addition, the evolution of the pandemic in Spain (where the data were collected) may have influenced the results. For example, the deaths' numbers, figures regarding active COVID-19 cases at the time of our study or even the specific responses the Spanish government was taking against the virus could have influenced responses. The results could be different in other countries depending on the local impact of the pandemic. Third, because the significant effects we identified were relatively small, future studies should replicate these findings. This would allow researchers to make more definitive statements about the trends identified in this study. Although the significant effects we found were modest, our research offers encouraging evidence and a model to use as an explanatory mechanism to launch communication campaigns and encourage further studies with larger samples in different contexts. In light of these results, which are contrary to what we hypothesised, we need also to consider the lack of control over the factors that participants felt were the causes of the pandemic. Knowing the participants' causal attribution of the COVID-19 would have helped us to confirm our explanations of the interaction effect we found between the priming and valence conditions.

5. CONCLUSIONS

The COVID-19 pandemic has had a profound global impact. It has been one of the most far-reaching and tragic public health crises in a century. In addition, although many of its consequences have already occurred, many others are likely to occur in the future in the coming months and years (Sarkis *et al.*, 2020). The implications of the COVID-19 pandemic on sustainability have not yet been seen. However, some studies, including this one, have attempted to figure out what impact the pandemic may have on sustainability efforts (Cohen & Kupferschmidt, 2020; Jribi *et al.*, 2020; Severo *et al.*, 2020).

This research confirms what has already been found about the evolution of environmental attitudes during the pandemic. It shows that people are still highly concerned about and committed to mitigating climate change (Severo *et al.*, 2020). Although we can be relatively optimistic about this, it is still necessary to be very cautious when proposing public policies to mitigate climate change. According to the results of our study, the type of information that is accessible, along with the valence (whether positive or negative) of such information, may have an effect on citizens' attitudes and their willingness to accept public policies to fight climate change. This research contributes to knowledge about how the different frames and valences affect citizens' attitudes and how this information can be used to promote pro-environmental attitudes. Policymakers may use the findings to neutralise the impact of this cognitive process of accessibility to frame those needs in the best possible way to overcome citizens' reluctance to support and implement public policies to mitigate climate change.

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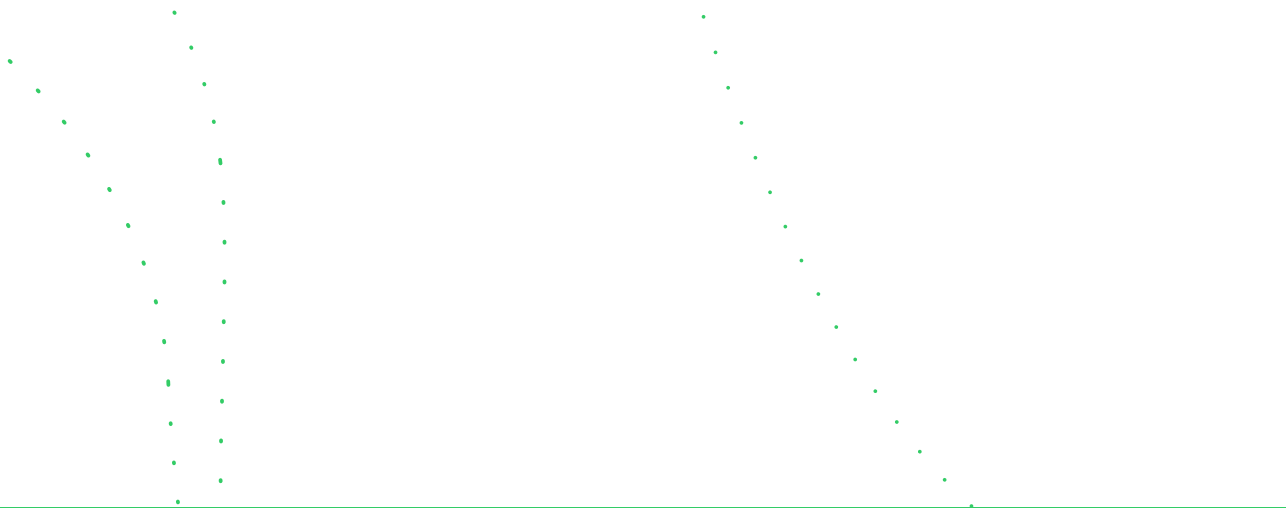
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