17th International Conference on Environmental Science and Technology

Athens, Greece, 1 to 4 September 2021

Environmental attitudes in times of a pandemic

MENIKI D.[1], MENIKI C.[2], PAPADONTA L.[3] and ANTONOPOULOU E.[4,*]

[1]Aristotle University of Thessaloniki, 54124 Thessaloniki
[2]Aristotle University of Thessaloniki, 54124 Thessaloniki
[3]Aristotle University of Thessaloniki, 54124 Thessaloniki
[4]Aristotle University of Thessaloniki, 54124 Thessaloniki

*corresponding author:
e-mail: eantonop@auth.gr

Abstract. The COVID-19 pandemic has undoubtedly had severe impacts on health care and economies everywhere in the world. This disaster, however, provided us with a unique opportunity: the privilege to watch nature healing due to the restriction measures applied on a global scale. Even though the positive environmental effects proved temporary, could this period serve as an example of what sustainable human behavior is? Has this disaster brought people closer to understanding the effects of their choices? Do people realize the connection between natural processes and the pandemic? Can people actually learn and adapt to a new normal? The present study aims to test the hypothesis that individual environmental beliefs and COVID-19 perceptions influence environmental attitudes and behavior. For this purpose, an on-line questionnaire survey was conducted, within the academic community of the Aristotle University of Thessaloniki, Greece, investigating the relationship between the effect of the pandemic on individual environmental behavior and attitudes. The results of this study hope to contribute to the efforts of the global community to effectively answer these questions, in order to gain a clear view on how to respond to future climate and other environmental challenges, which are, in a broader sense, pandemics as well.

Keywords: COVID-19, environmental behavior, environmental attitudes, sustainability

1. Introduction

The outset of COVID-19 pandemic and the restrictive measures that followed came with an unexpected surprise. Due to the global lockdown, Earth systems started to show signs of healing: bluer skies, clearer water bodies, animals marching into towns (DeAngelis, 2020; Chakraborty & Maity, 2020). This rejuvenation, while temporary, made people, even in the largest of cities, realize what nature would look like without their current lifestyle choices (Rupani, et al., 2020; Zellmer, et al., 2020). These outcomes, together with all the reports which suggested that the COVID-19 pandemic is partly a result of climate change (El Zowalaty, Young, & Jaerhult, 2020; Wu, Lu, Zhou, Chen, & Xu, 2016; Verma & Prakash, 2020), somewhat made it obvious that there is indeed a connection between the COVID-19 pandemic and human impact on the environment (Cheval, et al., 2020). Or did it? During lockdowns most people complied to the restrictive measures because they felt their lives and the lives of others were being directly threatened. As do the numerous environmental problems of today (Howard & Huston, 2019). However, it hasbeen argued that there is a psychological distance between environmental problems, such as climate change, and one's own immediate surroundings (Lucarelli, Mazzoli, & Severini, 2020; Reese, et al., 2020; Malella, et al., 2020). Hence, people do not feel the need for immediate change in their lifestyles. The purpose of this study is to examine whether the COVID-19 pandemic actually had an effect on people's environmental attitudes and behavior and, if so, in which direction. For this purpose, we test the hypothesis that the COVID-19 pandemic experience has prompted a newly found environmental awareness among young individuals, i.e. university students, who are the generation that will be most affected by any environmental change in the future, and, is the one that is going to shape the future (Lucarelli, Mazzoli, & Severini, 2020; Severo, Ferro De Guimaraes, & Dellarmelin, 2021).

2. The survey

For the purpose of the study an on-line survey was conducted among students of all levels at the Aristotle University of Thessaloniki (A.U.Th.), the largest university of Greece. On-line questionnaires were the only available option, due to the prohibition measures. LimeSurvey open source on-line survey web app was used to create the questionnaire.

The survey questionnaire was divided into four parts:

A. Introduction: participants were asked to write down the first three words that came into their minds when hearing the word COVID-19. These words would record the general sentiment of each participant towards the pandemic. This section was separate from the rest, and the responded had to first

complete this section, in order to proceed. This was designed in this manner in order to ensure that responses would not be influenced by the wording of the rest of the questions.

B. Environmental behavior during the COVID-19 pandemic: respondents were asked to answer a set of multiple choice and Likert scale questions regarding their environmental behavior during the pandemic.

C. Environmental attitudes and ethics: respondents were asked to answered a set of multiple choice and Likert scale questions regarding their general environmental attitudes and how these relate to the COVID-19 pandemic.

D. Demographics.

At the end of the questionnaire, participants were asked to state how easy it was to understand the questions in order to establish the reliability of the responses.

A pre-test of the questionnaire was administered among scientists and survey experts, in order to ensure that no important factor was omitted, and that the questions were structured in a clear, non-leading manner, addressing the issues in a correct way. Following that, a pilot survey was performed among students of other universities, as well as recent graduates of the A.U.Th in order to ensure the functionality of the survey. Participants' comments were recorded and adjustments were made accordingly.

The actual survey took place in December 2020, at a time when a new lockdown had just started to apply in the city of Thessaloniki, after the relaxation of measures during summer and autumn. The link to the on-line survey was sent via e-mailing lists to the whole student population of the Aristotle University of Thessaloniki, which numbers around 90,700 people. The questionnaire was accompanied by a brief note explaining the purpose of the study, stressing the importance of their participation, and assuring participants about the anonymity and confidentiality of their responses. 1821 questionnaires were returned, of which the 1411 were fully and correctly completed, which is a satisfactory sample given the size of the total population. Below we present part of the results that are related to the effect of the COVID-19 pandemic on individual pro-environmental behavior and attitudes.

3. Results

3.1. Words

In the first section of the questionnaire, participants were asked to write the first three words that came into their minds when they heard the term 'COVID-19'. Almost all of the words were related to coronavirus, hospitals, sickness, death, fear, masks, lockdown, social distancing, economy and pandemic. It has to be noted, given the purpose of this study, that only 5 out of the 3,423 words (0.15%) were directly related to nature or the environment.

3.2. Pro-environmental behavior

Pro-environmental behavior is depicted by a variety of actions (Lucarelli, Mazzoli, & Severini, 2020). In our survey, we used four factors to identify this behavior in participants: type of groceries bag, food packaging, type of face masks and recycling frequency. For three of these factors (groceries bag, food packaging, and recycling) a before-after the pandemic dimension was added, so as to identify the impact of the pandemic itself on environmental behavior. Face masks did not need this dimension, as it is clearly a product of the pandemic.

Results show that the amount of each one of the various types of bags used to carry groceries has not significantly changed after the start of the pandemic. Single use bags showed a slight rise, mainly due to fear of contamination. Out of the people that decided to use a different type of bag during the pandemic, a 18.78% reported that they changed the type of bag they use from single use to multiple use for environmental reasons. An interesting fact, however, that may require further investigation on an information dissemination level, is that among those who changed the type of bag they use, 21.83 % moved from reusable bags to single use bags to reduce the spread of the coronavirus and another 10.92% changed from single use bags to multiple use bags for the exact same reason.

Regarding the amount of packaged food purchases, most of the respondents say that it remained the same (77.39%). 18.93% report an increase on the amount of packaged food they purchase. Among the people that consume more packaged food, 40% mention that it is because they consider to be a safer choice and 37.87% attribute this increase to the fact that by buying packaged food they avoid crowded lines and finish their shopping more quickly. The third most popular reason (10.21%) given for this increase was that the total amount of purchases increased during the pandemic due to time availability and boredom.

As for face masks, most people (58.47%) use washable fabric masks. About half of them (49.45%) choose this type of mask mainly because it does less harm to the environment. Other reasons include aesthetic criteria, price, and easiness of breathing. Perceived safety is an issue, here, as well, since some respondents consider single use masks safer and other consider fabric masks to be safer. Since the use of face masks is a crucial element in the struggle against COVID-19, this aspect probably highlights a lack of appropriate and effective information communication to the public.

As far as recycling is concerned, the pandemic had almost no effect on the recycling frequency of the participants. 75.97% stated that the amount of recycling remained unchanged, 10.35% recycle more, for reasons that do not involve the pandemic, and 6.24% recycle less.

3.3. Environmental attitudes

In our survey, we used three parameters to identify whether the COVID-19 pandemic affected participants' attitudes regarding the natural environment:

- the effect of the pandemic on individual environmental risk perception,
- the level of agreement with the phrase "The lock down restrictive measures have rejuvenated the natural environment",
- the answer to the question: 'In your opinion which is the most important lesson the COVID-19 pandemic taught us?',

in order to test whether the pandemic had a positive effect on how participants view their relationship with the natural environment. In other words, did the current pandemic made them re-evaluate their views on the whole Man-Nature schema?

Results indicate that participants agree (71.65%) that initial lockdowns and prohibitions boosted environmental quality. Another 9,07% that disagree and 19.28% that neither agree, nor disagree.

For almost half of the participants (45.22%) the pandemic experience has not changed the level of worrying about environmental degradation, whereas concern has risen for 36.43% and fallen for 15.02%. There is also a 2.57% that have no concerns about environmental problems, either because they have faith in technology, or because they do not believe environmental problems exist.

Further exploring the above-mentioned results, we notice that even though almost 3 out of 4 people agree that their environment has improved due to the change of their everyday lifestyle, this is not translated into a change in pro-environmental attitudes, as only 1 out of 3 participants has begun to worry more about the environment. This could probably be attributed to the fact that, according to literature, there is a 'finite pool of worry' and worrying about one issue may reduce the level of worrying about other issues (Botzen, Duijndam, & van Beukering, 2021). Another possible explanation could be that their level of environmental concern was already high enough before the pandemic.

Finally, when asked what is the most important lesson learned from the pandemic experience in their opinion, participants expressed a variety of opinions. The results of this question can be seen in table 1.

Table 1. Responses to the question 'In your opinion, what did he COVID-19 pandemic teach us?'

Response	**%**
1. Humans are not the masters of the planet	37.28
2. It is a warning from nature: we have to stop destroying it	13.04
3. It is a God-sent punishment: people have lost their way	2.62
4. Nothing - People are incorrigible	14.60
5. There is nothing to learn - Pandemics is just another physical phenomenon	18.63
6. Other (eg. life is short, nothing is granted, freedom was underestimated, a combination of the above answers)	13.81

Replies 1 and 2, as well as some of the replies within the 'Other' category, are connected to pro-environmental attitudes, which means that a little over half of the participants made a definite connection of the pandemic to the natural environment.

4. Conclusions

The results of the present study indicate that the effect of the pandemic on the environmental behavior of participants cannot be conclusively described as positive. Recycling habits have not improved significantly. Food packaging purchases have increased for safety concerns. Use of single use masks is not negligible. Most of these materials are non-recyclable (yet necessary, up to a point) and their accumulation is expected to create significant problems in the near future, which is another side effect of the pandemic, apart from the economic recession.

However, results suggest that there is a definite positive shift of respondents' pro-environmental awareness due to the whole COVID-19 pandemic experience. Numbers imply that people have begun to, at least, contemplate on how their actions effect the environment. These results seem to confirm the findings of other studies which show that the pro-behavior has not been significantly affected (Rousseau & Deschacht, 2020), but environmental attitudes have been somewhat enhanced (Ramkissoon, 2020; Jribi, Ben Ismail, Doggui, & Debbabi, 2020).

Hopefully, some of these changes, however small, will become permanently incorporated into everyday lives. Habits can change in the face of grave danger (Cohen, 2020). This is not a utopic dream. As indicated in Google Trends, 'how to change the world' was searched twice as much as 'how to go back to normal' in 2020.

In any case, all these aspects need further investigation, and it will be a while until we have a clear view of the consequences of the pandemic. The present study aims to add to the research that attempts to explain if and how pandemics such as this affect environmental attitudes and behaviors, in order to help future decision making to be more informed. Especially, since, according to calculations, zoonotic pandemics might become a regular phenomenon in the near future due to climate change (Lucarelli, Mazzoli, & Severini, 2020; Howard & Huston, 2019; Reese, et al., 2020). As DeAngelis states, COVID-19 pandemic is 'one of the greatest natural experiments of our lives' (DeAngelis, 2020). It's our job to interpret the data correctly and respond accordingly, in order for this pandemic to be a milestone rather than a parenthesis.

References

Botzen, W., Duijndam, S. and van Beukering, P. (2021), Lessons for climate policy from behavioral biases

towards COVID-19 and climate change risks. *World Development,* **137**, 105214.

Chakraborty, I. and Maity, P. (2020), COVID-19 outbreak: Migration, effects on society, global environment and prevention. *Science of the Total Environment*, 138882.

Cheval, S., Adamescu, C.M., Georgiadis, T., Herrnegger, M., Piticar, A. and Legates, D.R. (2020), Observed and Potential Impacts of the COVID-19 Pandemic on the Environment. *Environmental Research and Public Health*, **17**, 4140.

Cohen, M.J. (2020), Does the COVID-19 outbreak mark the onset of a sustainable consumption transition? *Sustainability: Science, Practice and Policy*, **16**, 1-3.

DeAngelis, T. (2020, July 1), *Could COVID-19 change our environmental behaviors?* Retrieved from American Psychological Association: https://www.apa.org/monitor/2020/07/environmental-behaviors

El Zowalaty, M., Young, S.G. and Jaerhult, J.D. (2020), Environmental impact of the COVID-19 pandemic – a lesson for the future. *Infection ecology & Epidemiology,* **10**, 1768023.

Howard, C. and Huston, P. (2019), The health effects of climate change: Know the risks and become part of the solutions. *Canada Communicable Disease Report*, 114-118.

Jribi, S., Ben Ismail, H., Doggui, D. and Debbabi, H. (2020), COVID-19 virus outbreak lockdown: What impacts on household food wastage? *Environment, Development and Sustainability*.

Lucarelli, C., Mazzoli, C. and Severini, S. (2020), Applying the theory of planned behavior to examine pro-environmental behavior: The moderating effect of COVID-19 beliefs. *Sustainability,* **12**, 10556.

Malella, R., La Malva, P., Marchetti, D., Pomarico, E., Di Crosta, A., Palumbo, R., Cetara, L., Di Domenico, A. and Verocchio, M.C. (2020), The Psychological Distance and Climate Change: A Systematic Review on the Mitigation and Adaptation Behaviors. *Frontiers in Psychology,* **11**, 568899.

Ramkissoon, H. (2020), COVID-19 Place Confinement, Pro-Social, Pro-environmental Behaviors, and Residents' Wellbeing: A New Conceptual Framework. *Frontiers in Psychology*, **11**, 2248.

Reese, G., Hamann, K.R., Heidbreder, L. M., Loy, L.S., Menzel, C., Neubert, S., Troeger, J. and Wullenkord, M.C. (2020), SARS-Cov-2 and environmental protection: A collective psychology agenda for environmental psychology research. *Journal of Environmental Psychology*, **70**, 101444.

Rousseau, S. and Deschacht, N. (2020), Public Awareness of Nature and the Environment During the COVID-19 Crisis. *Environmental and Resource Economics,* **76**, 1149-1159.

Rupani, P.F., Nilashi, M., Abumalloh, R.A., Asadi, S., Samad, S. and Wang, S. (2020), Coronavirus pandemic (COVID-19) and its natural environmental impacts. *International Journal of Environmental Science and Technology*, 4655-4666.

Severo, E.A., Ferro De Guimaraes, J.C. and Dellarmelin, M.L. (2021), Impact of the COVID-19 pandemic on environmental awareness, sustainable consumption and social responsibility: Evidence from generations in Brazil and Portugal. *Journal of Cleaner Production,* **286**, 124947.

Verma, A.K. and Prakash, S. (2020), Impact of COVID-19 on environment and society. *Journal of Global Biosciences*, **9**(5), 7352-7363.

Wu, X., Lu, Y., Zhou, S., Chen, L. and Xu, B. (2016), Impact of climate change on human infectious diseases: Empirical evidence and human adaptation. *Environment International,* **86**, 14-23.

Zellmer, A.J., Wood, E. M., Surasinghe, T., Putman, B. J., Pauly, G.B., Magle, S.B., Lewis, J.S., Kay, C.A.M. and Fidino, M. (2020), What can we learn from wildlife sightings during the COVID-19 global shutdown? *Ecosphere*, **11**, 03215.