Do people adapt their pro-environmental behavior according to their environment? An experimental investigation

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Introduction

The shortage of energy resources, climate change, the increase in household and industrial waste are today unavoidable constraints to take into account when thinking about the organisation of current societies. For many years, governments in most countries have implemented environmental policies to make our development more sustainable. Until now, these policies have been based on strict regulations, adapted infrastructures or awareness campaigns. In France, for example we remember the advertising campaign aimed at encouraging households to recycle their used light bulbs precisely in devices designed for this purpose in supermarkets. It should be said, however, that these policies alone cannot achieve their goal and only very partially succeed in changing citizens' behaviour. To make policies more effective, internal factors (habits and cognitive processes), external factors (instruments based on market mechanisms) and social factors (social conventions) should be considered simultaneously. One of the current directions is to look at how economic agents take their decisions in reality, not how they should take them.

Thaler et Sunstein (2009) invent a new economic concept they call "libertarian paternalism". Based on the idea that human beings do not make rational choices based solely on the economic value of things, this theory proposes to set up decision-making aids called nudges. The nudge is defined as a simple, inexpensive, and non-binding action whose purpose is to guide individuals in making decisions that improve their well-being, or more generally, that of society. This action may reveal the use of psychological biases, may rely on emotions, or take the form of information given to individuals to trigger awareness. Our article will rely on the concept of nudge, based on the influence of the environment and visual cues surrounding us on our emotions, on the pro-social behaviors of individuals in terms of donation as well as a sorting behavior.

In the laboratory, we expose participants to nature, or to an urban environment via videos, and observe their behavior; an economic decision (dictator game where the recipient is an Non-Governmental Organization), and an effective pro-environmental behavior (selective sorting). We show that people who are exposed to nature feel happier, are more generous and recycle more than those exposed to urban visual cues.

Current issues

Over the past decades, the conception of new technologies to mitigate the environmental impacts of economic activities has been a worldwide challenge. However, technology innovation only is insufficient, because its efficiency depends strongly on the users' behavior. Consequently, behavioral changes have a role as worthy as technology progress in achieving environmental improvements.

Furthermore, modern lifestyles contribute to environmental destruction not only via excessive consumption, but also by disconnecting people from nature. Indeed, 54% of the world population live in urban area, spend a large part of their time indoors due to their jobs, and even personal activities may take place away from nature (MacKerron and Mourato, 2013). This physical disconnection may also foster a psychological disconnection. As a matter of fact, when humans do not feel like they are part of larger ecosystems, they may be less inclined to protect the natural environment (Schultz, 2000). As a consequence, individuals' subjective connectedness with and exposure to nature consistently predict pro-environmental attitudes and behaviors, as well as happiness.

In the literature, recent contributions in behavioral economics and environmental psychology have tried to better understand pro-environmental behaviors in connection with nature representation. For example, Wu et al. (2016) set up an experiment within an "atmospheric" building, namely a sustainable building with several visible indexes reminding it (e.g. collection and purification of water, intensive use of wood in the building construction, ...). In this experiment, they show that atmospheric buildings can enhance individuals' motivations and then increase recycling behavior. Besides, Zelenski et al. (2015) found consistent evidence that exposure to nature (through video viewing) can foster cooperative behavior.

In this paper, our aim is then to assess how being exposed to a natural environment can raise pro-environmental behaviors. Our primary objective is then to show how this kind of exposure could successfully be operationalized for better technology use.

Materials and methods

In this paper, we implement an experimental protocol to assess pro-environmental behaviors through both a monetary donation to a Non-Governmental Organization (NGO) and an effective behavior of selective sorting. We rely on the dictator game with participants exposed to different environments.

We investigate three hypotheses regarding behavioral insights. Our first hypothesis (Hypothesis 1) is that being exposed to a natural (respectively urban) environment, operationalized by viewing a Planet Earth (respectively architecture) video, would alter individual emotional states differently. Our second hypothesis (Hypothesis 2) is that being exposed to a natural environment would incentivize participants to donate (as a trigger effect and on the amount donated). Last, our third hypothesis

(Hypothesis 3) is that being exposed to a natural environment would incentivize effective pro-environmental behavior (selective sorting).

To test our hypotheses, we conduct the following experimental protocol. In a first step, we measured stated pro-environmental preferences via the French version of New Environmental Paradigm (NEP) Scale (Dunlap et al., 2000; Schleyer-Lindenmann et al., 2016). In a second step, we randomly assigned participants to view a video being either a documentary of Yellowstone Park ("nature" environment) or a documentary on the architecture of New-York City ("urban" environment). In a third step, participants were then asked to play a dictator game with a monetary donation to an environmental NGO. And finally, we observed a direct measure of selective sorting (throw in the recycle bin the earphone protection provided for the experiment). The emotional states of the participants were checked twice during the experience. A first assessment was made upon their arrival; the second one was made after the video viewing to estimate the evolution of valence and arousal. The measures were made by the “Affective Slider” scale (Betella & Verschure, 2016).

Results

With regards to our three hypotheses, we obtain the following results from our experiment.

First, participants who watched the Planet Earth video ("nature" environment) felt happier than participants who watched a documentary on the architecture of New-York City ("urban" environment), the difference between the two treatments being statistically significant (Hypothesis 1).

Second, in our sample, we found that 21.9% of the participants don’t transfer any money to the NGO, which is lower to figures found in the literature (Engel, 2010). Even so, the amount of donations should increase because the recipient is an NGO (Eckel and Grossman, 1996). We found that participant gave more when being exposed to the effect to a type of environment on donation. We also noticed that the effect of exposure on donation is only existing on participants who don’t have a pro-environnemental profile. The difference on amount of donation between the two groups is not significant when subjects has a Nep score higher than 4 (pro-NEPs participants). Furthermore, pro-NEP participants did not give more to an environmental NGO than the others.

Third, we observe nearly the same results regarding selective sorting (Hypothesis 3). Participants recycled more after watching the Planet Earth video ("nature" environment), this result is only significant at the 10% level $\chi2(1) = 2.831$, $p = 0.0925$. Nevertheless, this effect is much more visible for participants who do not have a pro-environmental profile. In addition, we noticed that pro-NEP participants’ behavior are consistent to their beliefs because they statistically recycled more than those with a lower NEP score.

Moreover, a Probit regression shows that the probability of recycling increases the nature environment treatment as well as age, feeling financially comfortable, and the “Limits of growth” and “ecocrisis” dimensions of the NEP scale.

Discussion and conclusion

Finally, our results indicate that people who are exposed to nature are more generous towards ENGOs and recycle more than those exposed to urban visual cues. Research on short-term consequences of nature exposure also suggests that nature could promote sustainability, particularly when sustainable behaviors are associated to cooperative behaviors (Mayer et al., 2009; Nisbet and Zelenski, 2011). We found that being exposed to a natural environment promotes sustainability through simple prosocial behavior, without any interaction between individuals? We find evidence both for an economic decision (donation to an environmental NGO) as for a behavioral decision (earphone protection thrown in the waste bin) which is consistent with the literature (Capaldi A., Dopko L., and Zelenski, 2014; Corral-Verdugo et al., 2011; Grinde and Patil, 2009).

The main limit of our experiment is that we are unable to disangle between the effect of exposure to nature and the effect of happiness. Indeed, Drouvelis and Grosskopf (2016) have shown clear evidence that measures of social preferences are sensitive to subjects' current emotional states. Specifically, angry subjects contribute on average less than happy subjects, and the overall welfare measured by average net earnings is lower when subjects are in an angry mood. As being exposed to nature generates a positive emotional state, we will implement a third treatment (video inducing a positive emotion without showing natural and environment cues).

To conclude, recent messaging around climate change often prefers economic or security arguments, which generate negative emotions. Nature imagery could produce better reminders or more persuasive appeals to behave sustainably. Our research is part of a large corpus that praises the benefits of nature not only for personal well-being, such as health benefits (Reddon & Durante, 2018) but also for society as a whole, by reducing aggression and crime. To go further, we aim to carry out a field experiment where people would be exposed continuously to a "nature" environment at their work place. A one-shot exposure to nature will probably not permanently change people's behavior (except combined with transient emotion, which can become the basis for future decisions and hence outlive the original cause for the behavior (Andrade & Ariely, 2009)), and it is possible that momentary feelings of connectedness with nature do not cause sustainable choices in the same way that a more stable exposure.

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