Projection bias in environmental attitudes and behavioral intentions

Sophie Clot, Gilles Grolleau, Lisette Ibanez

CEE-M
CENTER FOR ENVIRONMENTAL ECONOMICS – MONTPELLIER

Projection bias in environmental attitudes and behavioral intentions

Sophie Clot
Gilles Grolleau
&
Lisette Ibanez

CEE-M Working Paper 2020-08

CEE-M

INRAE

cnrs

SupAgro Montpellier

Projection bias in environmental attitudes and behavioral intentions

S. Clot[1], G. Grolleau[2,3], L. Ibanez[3]

Abstract: The projection bias corresponds to the human tendency to project current preferences into the future as if present tastes remained unchanged. We apply the projection bias to the environmental domain and design a survey experiment to investigate its relevance on two environmentally friendly initiatives, namely solar panels and eco-friendly transport. We found that some attitudes and behavioral intentions are subject to positive change when individuals are solicited a day when the weather is congruent with the proposed changes. We draw several policy and managerial implications for ecological issues.

Key-words: environment, experimental survey, projection bias, solar panels, transport.

JEL numbers: C 91; D12, D91, Q59.

[1] Department of Economics, University of Reading, United Kingdom

[2] CEREN EA 7477, Burgundy School of Business, Université Bourgogne Franche-Comté, Dijon, France

[3] CEE-M, Univ. Montpellier, CNRS, INRAE, Institut Agro, Montpellier, France

Projection bias in environmental attitudes and behavioral intentions

1. Introduction

It is now well established that people frequently exhibit biases that make their decisions appearing as irrational but predictable. Interestingly, an important but often neglected bias, especially in the ecological economics literature, is the fact that people may think that their current preferences will remain the same in the future, albeit their current preferences are influenced by incidental or even irrelevant information. For instance, going to the grocery store and being very hungry frequently results in higher purchases of junk food and higher willingness to pay, even if the consumption is scheduled later (Loewenstein et al., 2003; Briz et al., 2015; de-Magistris and Gracia, 2016). In other words, people's predictions are frequently shaped by their current emotional states. This tendency to project the present into the future leads to predictions that are too present-biased. Gilbert et al. (2002) coined a term for this kind of behavior, that is, presentism and defined it as a "tendency to over-estimate the extent to which [people's] future experience of an event will resemble their current experience of an event." Even in the cases of very important economic decisions such as buying houses and cars, anecdotal and rigorous empirical evidence supports that people succumb to the projection bias (Colin et al., 2007; Busse et al., 2013; Busse et al., 2015; Acland and Levy, 2015).

In this paper, we test the projection bias in the environmental domain by examining whether it is likely to influence environment-related attitudes and decisions. For instance, a survey on people's opinions about the reality of climate change revealed that public support to undertake ambitious efforts can be over-influenced by the weather at the administration time (Egan and Mullin, 2012). The same sample can respond very differently on days with extreme weather (e.g., a very rainy and cold day or a very sunny and hot one) compared to usual weather. This bias is likely to be exacerbated in case of floods or other extreme events. Concretely, this bias can be exploited strategically by various influencers (e.g., weather-based marketing) in order to get what they want. Evaluating the willingness to pay for natural amenities such as quietness and calm can be overly influenced by days where noise pollution is high even if this situation is non-recurring (e.g. road works). Similarly, a temporary power interruption can unduly influence willingness-to-pay or adoption of individual solar energy production systems. Water-

saving devices can be more attractive for consumers on a drought period, even if this period does not reflect the objective circumstances of the considered location. If empirically supported, this bias can help influencers to shape outcomes in favor of their agenda. For instance, sales forces or pollsters can be organized to exploit certain opportunity windows. The relevance of the projection bias in the environmental realm is considerable, especially if one considers the large range of attitudes and behaviors that can be influenced and the likely ratchet effect. Indeed, once some decisions are implemented, expectedly environmentally-friendly ones, such as solar panels, there is a ratchet effect that restrains the likelihood of going back.

In order to go beyond asserting this likely effect, we performed a survey experiment to examine if the weather at the administration time would influence the responses of participants to a questionnaire addressing two ecological actions, *i.e.,* the attitude and purchase intention of solar panels and the attitude and willingness to use more environmentally-friendly transport. The survey instruments are perfectly identical, except that they are administered either on a rainy or sunny day as reported by the local weather bulletin and also reported by research assistants. As a preview, we found that attitudes towards solar panels (i.e. beliefs that solar panels are financially profitable) and intentions to adopt environmentally friendly transport are around 10% higher on sunny days, compared to rainy ones.

The remainder of this note is organized as follows. The next part introduces the conceptual framework, overviews relevant literature, considers its application to environmental issues and draws the main hypotheses. Section 3 is devoted to the empirical strategy. Section 4 provides the main results, discusses them and suggests several policy and managerial implications. Section 5 concludes.

2. Conceptual framework and main hypotheses

Even if the insight was more or less cursorily mentioned in some papers, a path-breaking contribution on projection bias was written by Loewenstein et al. (2003). They defined and characterized the projection bias, explained why it occurs and showed its applicability to a wide range of economic relevant situations such as purchases of durable goods, saving decisions over

the lifecycle and addictive behaviors. A possible explanation of projection bias is the false assumption that one's own current beliefs, behaviors, and feelings are accurate, shared by all and will be also shared by his/her future self (Loewenstein et al., 2003). For example, people frequently under-appreciate habit formation and hedonic adaptation in case of traumatic events (Loewenstein et al., 2003). This bias may also occur because one's current emotional states serve as an anchoring point and basis for his/her beliefs, feelings and behaviors. When making decisions about the future, this anchoring point serves as a reference.

A sizeable literature found convincing empirical support for the projection bias in a variety of domains. Using data on catalog orders of cold-weather items, Conlin et al (2007) found evidence that people's decisions are over influenced by the current weather. In the same line, Busse et al. (2013, 2015) showed that a warm weather led people to buy a disproportionate number of convertibles and homes with swimming pools. Further, this literature also brings support to the existence of a projection bias in various high stake investment decisions, such as housing or college enrollment (Simonsohn, 2010). In the environmental realm, Chang et al. (2018) found that daily air pollution levels have a significant effect on the decision to purchase or cancel health insurance in a manner inconsistent with rational choice theory but consistent with projection bias and salience. More precisely, a one standard deviation increase in daily air pollution leads to a 7.2% increase in the number of insurance contracts sold that particular day. Lamp (2018) tested for the effect of weather on solar technology adoption and showed that a one standard deviation increase in monthly sunshine hours above the long-term average leads to an approximate 6.2 % growth in the residential solar market over a six-month period. He considered a range of potential mechanisms to explain these results and found strong support for the projection bias explanation.

In line with the preceding literature on the projection bias, we hypothesize that weather conditions influence individuals' attitudes and behavioral intentions in the environmental realm. More precisely, we predict that people are more likely to express favorable beliefs regarding the ecological efficiency, as well as higher behavioral intentions of adopting environmentally friendly alternatives, *i.e.*, solar panel and environmentally friendly forms of transport (e.g., walking, bicycle, public transit) if they are approached on a congruent day, precisely a sunny day compared to a rainy one. From a rational perspective, the day's weather at the time of the survey administration should not have any impact on attitudes and behavioral

intentions for decisions that have long term consequences. Based on the previous discussion, we formulate the two following hypotheses:

- ✓ *H1: People will express more favorable beliefs on the ecological efficiency when the weather at the survey administration day is congruent with the suggested environmentally friendly propositions.*

- ✓ *H2: People will express higher behavioral intention of adopting environmentally friendly alternatives when the weather at the survey administration day is congruent with the suggested environmentally friendly propositions.*

3. Empirical strategy

In order to test these two hypotheses, we designed an experimental survey with a simple between-subjects design (Weber, 1992; Croson et al., 2007) involving an identical survey being administrated during different weather conditions (Table 1), *i.e.*, either during sunny days (T1) or during rainy days (T2) as indicated in the local weather bulletin[4]. We take precautions to administer the survey at similar days, times and places to avoid the introduction of potentially confounding factors.

Table 1. A simple experimental design

T1	T2
Sunny day	Rainy day

The survey instrument (see Appendix 1) focusses on two domains where environmental improvements can be made, precisely solar energy as an alternative to fossil energy and eco-friendly transport such as walking, biking or public transport. These two domains have been selected first, for their high level of realism. For instance, French authorities encourage

[4] Even if we use a binary distinction (sunny versus rainy days), we are conscious that this operationalization is simplistic and recommends to use more nuanced distinctions regarding the characterization of weather (e.g., temperature, luminosity, clouds). Moreover, all sunny days or rainy days are not created equal. For instance, a sunny day out of season compared to a similar sunny day in the season can impact differently the results. Nevertheless, these issues are beyond the scope of our paper and constitute interesting extensions.

individuals to set up solar panels thanks to financial incentives[5]. Similarly, in France, private companies and some public employers encourage their employees to bike by paying them a kilometric allowance, with tax advantages[6]. Financial incentives also exist to push people to use public transport to commute. A second reason for selecting these two domains is related to the different types of effort necessary to induce a behavioral change. Purchasing solar panels is financially costly, whereas adopting eco-friendly transport modes requires more time and physical efforts. Finally, both domains are intimately connected to the weather. Solar panel are expected to be more efficient on sunny days and eco-friendly transport would be more enjoyable in good weather.

The survey starts with a brief introduction on the environmental and private benefits associated to solar panel and eco-friendly transport (see the survey instrument in Appendix 1). Then, for each domain, we surveyed individuals on their attitudes regarding whether they believe that investing in solar panels (respectively adoption of eco-friendly transport) is advantageous to protect the environment, and their willingness to adopt behavioral changes, i.e., purchase of solar panels, (respectively, adopt eco-friendly transport to go to their workplace). Participants indicated their answers to the main questions on a 4-point Likert scale ranging from 1 (e.g., not advantageous at all) to 4 (e.g., very advantageous). Our choice of a 4-levels scale was motivated by the willingness to avoid the so-called neutrality heuristics, that is the tendency of respondents to select the neutral option by selecting 3 on a 5-point Likert scale.

The pen and pencil questionnaires were administered in February 2019 to a sample of bystanders solicited on a voluntary and random basis in the metropolitan area of Montpellier, an often sunny city in the South of France, where these two initiatives are well publicized. This sample can be considered as a convenience sample, and as such raises some suspicions among scholars. Nevertheless, this *a priori* judgement is not necessarily justified, especially when the researcher is interested in qualitative information, on whether a day's weather will influence pro-environmental preferences and self-stated intentions. For instance, Mullinix et al. (2015) performed two studies of how experimental treatment effects obtained from convenience

[5] https://www.economie.gouv.fr/particuliers/aides-installation-photovoltaiques

[6] http://www.villes-cyclables.org/?mode=observatoire-indemnite-kilometrique-velo

samples compare to effects produced by representative population samples. Their findings "reveal considerable similarity between many treatment effects obtained from convenience and nationally representative population-based samples". The previous authors argued that their results "bolster confidence in the utility of convenience samples". Precautions were taken to prevent participants from discovering the manipulated variable. Moreover, and noteworthy, no participant detected the real purpose of the study, namely the impact of the day's weather on self-reported responses.

4. Results and discussion

We gathered a sample of 218 useable observations. As indicated above, bystanders in the Montpellier area were randomly solicited to fill a questionnaire. We collected data on age, gender, financial situation, level of education as well as about their transportation habits and frequency of using car, bike, public transport or walking. Our sample is somewhat gender unbalanced given that 69% of respondents are females. Some descriptive statistics regarding the sample are provided in Table 2. 39% of the sample use frequently their car, 50% never bike, 13.8% (respectively 26%) walk (use public transport) infrequently. These control variables allow us to distinguish the population who could be more motivated to adopt eco-friendly transport in the future.

Table 2. Descriptive statistics regarding the sample (N=218)

Variable	Mean	S.D.	Min	Max
Age	28.12	14.562	16	93
Older than 25	0.335	0.473	0	1
Gender *(Men=1)*	0.307	0.462	0	1
Financial situation	2.225	0.737	1	4
Comfortable	0.372	0.484	0	1
Education level	2.381	0.589	1	3
High	0.436	0.034	0	1
Frequency of transport				
Car - *frequently*	0.39	0.489	0	1
Bike - *never*	0.509	0.501	0	1
Feet - *infrequently*	0.138	0.345	0	1

Public transport - *infrequently*	0.261	0.44	0	1

Table 3 reports the average ratings of beliefs and behavioral intentions regarding solar panels and eco-friendly transport mode. By comparing average ratings, we found that 1) surveyed individuals believe that solar panels are more profitable on a sunny day than on a rainy day, and 2) they are more willing to adopt an eco-friendly transport mode when they fill in the questionnaires under sunshine than when it rains. The Spearman test shows that the trend of the means for the ordered dependent variables across treatments are not equal for beliefs on the profitability of solar panels (ρ= 0.075) and for the intention to adopt eco-friendly transport (ρ= 0.022).

Table 3. Average ratings of beliefs and behavioral intentions regarding solar panels and eco-friendly transport (S.D. indicated in brackets)

Treatment		*Solar panels*		*Eco-friendly transport*	
	N	***Profitable investment (belief)***	***Purchase (behavioral intention)***	***Important ecological impact (belief)***	***Adoption (behavioral intention)***
T1(sunny)	105	3.28 (0.563)	2.68 (0.803)	3.76 (0.45)	3.55 (0.734)
T2 (rainy)	113	3.08 (0.746)	2.69 (0.846)	3.646 (0.55)	3.32 (0.837)
p-value (Spearman rank correlation, ρ)		**0.075***	0.800	0.119	**0.022****

To investigate further the impact of weather on participants' replies, we run an ordered probit regression (Table 4) to explain participants' beliefs on profitability to invest in solar panels and their intention of purchase (behavioral intention) by controlling for some socio-demographic variables. In short, the data supports that the day's weather at the administration time impacts beliefs on the profitability of solar panels, but not the purchase intention of participants.

Table 4. Ordered probit regression for profitability beliefs and purchase intention regarding solar panels

Variable	Profitable investment (belief)	Purchase (behavioral intention)
Treatment		
T1 : Sunny day	**0.274***	-0.052
Gender	**-0.445*****	-0.113
Age (older than 25)	**-0.293***	-0.244
Financial situation		
Comfortable	0.089	0.229
Education level		
High	-0.134	-0.194
Log Likelihood	-204.38	-244.73
LR Chi2	17.75***	7.85**
Pseudo R2	0.042	0.016
Nb of obs.	218	218

On sunny days, a greater proportion of people judge solar panels to be profitable. More precisely, we observe a 9,2% increase of people declaring solar panels to be very profitable (see Table 5). We also find that men and older people are more skeptical about the financial interest of investing in solar panels. The temporal horizon can be an explanation of the lower perceived profitability for men and older people. Interestingly, McLeish and Oxoby (2009) identify pervasive age and gender stereotypes pertaining to intertemporal choices: first, younger people have higher discount rates than older people, and second, women are more patient than men.

The weather conditions at the survey administration time do not seem to influence the behavioral intentions to purchase solar panels.

Table 5. Marginal effects of sunny weather on the belief that solar panels are profitable

Belief that solar panels are profitable	**Marginal effect**
Not at all profitable	-0.010
Not very profitable	**-0.039***
Profitable	**-0.043***
Very profitable	**0.092***

Concerning eco-friendly transports, the results are more pronounced as the weather conditions at the time of the survey impact both beliefs and behavioral intentions. Indeed, Table 6 indicates that sunny weather at the time of survey administration impacts positively participants' beliefs that environmentally friendly transports contribute to the protection of the environment (corresponding at a 10% increase in responses indicating that these transports are very eco-friendly, cf. Table 7a). In relation to the intention to adopt eco-friendly transport (Table 7b), we observe an increase of 10% for people choosing to use an environmentally friendly transport mode every day when the weather at the time of survey administration time is sunny. Not surprisingly, older people are more reluctant to adopt environmentally friendly transport as it requires more physical effort and time. Of course, a behavioral change is far more complicated (respectively, easier) for people who use their car (respectively public transport) frequently and those who are not accustomed to eco-friendly transports. Also, as could be expected, increases in belief and behavioral intentions are associated with a carryover effect from ambivalent classes (selecting 2 or 3 on the Likert scale) as illustrated by tables 7a and 7b. This suggests that a projection bias may only affect people at the frontier of behavioral change rather than inducing more radical reversal.

Table 6. Ordered probit regression for eco-friendly transport/ beliefs and behavioral changes

Variable	**Positive ecological impact (belief)**	**Adoption (behavioral intention)**
Treatment		
T1 : Sunny day	**0.307***	**0.304***
Gender	0.2	0.1
Age (older than 25)	-0.025	**-0.364***
Financial situation		
Comfortable	-0.068	0.122
Education level		
High	-0.004	0.026
Frequency transport		
Car - *frequently*	0.162	**-0.372****
Bike - *never*	-0.094	**-0.52*****
Feet - *infrequently*	-0.059	**-0.6*****

Public transport - *infrequently*	-0.316	**-0.565*** **
Log Likelihood	-142.58	-193.76
LR Chi2	5.8	44.96***
Pseudo R2	0.02	0.104
Nb of obs.	218	218

Table 7a. Marginal effects of sunny weather at the administration time on the perceived environmental friendliness of eco-friendly transport

Belief in the environmental friendliness of eco-friendly transport	**Marginal effect**
Not at all environmentally friendly	-
Not very environmentally friendly	-0.0159
Environmentally friendly	**-0.0827***
Very environmentally friendly	**0.1***

Table 7b. Marginal effects of sunny weather at the administration time on willingness to adopt eco-friendly transport

Behavioral intention to adopt eco-friendly transport	**Marginal effect**
Never	-0.01
Sometimes	**-0.053***
Often	**-0.04***
Every day	**0.102***

A natural implication of our results is to subtly use the weather variations to schedule some activities such as prospecting new clients for solar panels on sunny days rather than rainy ones or similarly encourage the use of commitment devices when the weather is good to make behavioral intentions, such as the use of eco-friendly transport, more sustainable. In a similar fashion, interested influencers can get polls more aligned with their interests by cleverly selecting the day on which respondents will be solicited. People may be more likely to support initiatives to fight climate change if they are solicited a day that is congruent with climate change. Similarly, attitudes and stated willingness-to-pay for some environmental amenities can be unduly influenced by the immediate situation, beyond what is rationally expected. Our findings also encourage wise decision makers to not take all survey results at face value and to question how they have been obtained and possibly manipulated. Weather-based nudges or other tactics exploiting the projection bias of individuals can provide a refreshing way to better

understand attitudes and behaviors. They enrich the toolbox to advance the environmental agenda, but should not divert the attention from more effective instruments that frequently require higher levels of political courage (Schubert, 2017). Nevertheless, reaping these low-hanging benefits thanks to weather-based nudges also raises ethical concerns (Hansen and Jespersen, 2013; Sunstein, 2015; Schubert, 2017) and can backfire. Indeed, some individuals may question the ethicality of these "tricks", given that the line is thin between legitimate influence and manipulation. Even if these dimensions are beyond the scope of our contribution, we argue that they deserve more academic attention.

Moreover, most people associate environmentally-friendly alternatives with a kind of sacrifice, notably in terms of convenience, such as compromising personal comfort (e.g., reducing heating or flying less) to be sustainable. If the current experience of this sacrifice over-influences future choices, without taking into account the human propensity to adapt, this projection bias can lead to suboptimal adoption of environmentally-friendly initiatives. A first insight can be to reduce the perceived sacrifice at the first stage in order to harness and channel the projection bias energy in desirable directions. An additional strategy involves the examination of de-biasing approaches (Lilienfeld et al., 2009) such as informing (and training) people at the right time about the bias presence and effects or using the testimony of relevant people who have successfully crossed the line. These insights can constitute promising avenues of intervention. Another strategy to counterbalance an undesirable projection bias effect can be to design and implement cooling-off periods during which people can reverse their decisions.

5. Conclusion

The human tendency to over-rely on current emotional states to predict future states can be detrimental or conducive to the adoption of environmentally friendly initiatives. Indeed, we showed that the day's weather at the time of survey administration is likely to impact beliefs and behavioral intentions in the environmental realm. More precisely, sunny days have a positive impact on beliefs regarding the ecological relevance of certain pro-environmental behaviors (in our study the adoption of solar panels and environmentally friendly transports) and can even encourage behavioral changes (i.e., higher intention to switch to environmentally friendly transports). Our findings are consistent with the projection bias, even if it is difficult to

completely rule out alternative explanations. Even if we caution the reader to not over-interpret or over-generalize from our results, we argue that projection bias deserves more attention from scholars and practitioners. We also suggested several policy and managerial implications that can help (well-intentioned but also bad-intentioned) influencers to get more support aligned with their vested interests. Finally, we discussed some ways to de-bias individuals, but as far as we know, these strategies remain to be tested to assess their effectiveness in relationship with the projection bias.

Our survey experiment has several limitations. For example, we do not measure a real behavioral change, nor employ an incentive-compatible design, which could constitute the next steps for future research. Moreover, considering how a larger range of weather variations (e.g., subtle versus more extreme variations) affects individuals' reactions deserves more attention as well as other nudges based on the projection bias. Our findings do not inform policymakers on the magnitude of the projection bias. Moreover, the projection bias does not occur in a vacuum. It is likely to interact with other biases such as loss/gain framing, making the combined effect more complex. Moreover, the robustness of our findings can be tested on other items such as the purchase of flood protection devices on rainy days or the proposal of introducing windbreak measures on windy days. Rather than providing a clear cut and definitive conclusion, our results constitute a vibrant call to stimulate further research on the projection bias in the environmental realm.

References

Acland, D., Levy, MR. (2015). Naiveté, Projection Bias, and Habit Formation in Gym Attendance, *Management Science*, 61 (1), 146–60.

Briz, T., Drichoutis, A., House, L. (2015) Examining projection bias in experimental auctions: the role of hunger and immediate gratification. *Agricultural and Food Economics,* 3-22.

Busse, MR., Pope, DG., Pope, JC., Silva-Risso, J. (2015). The psychological effect of weather on car purchases, *The Quarterly Journal of Economics*, 130(1), 371–414.

Busse, Meghan R., Devin G. Pope, Jaren C. Pope, and Jorge Silva-Risso (2012). *Projection Bias in the Car and Housing Markets*. Cambridge, MA: National Bureau of Economic Research.

Chang, TY., Huang, W., Wang, Y. (2018). Something in the Air: Pollution and the Demand for Health Insurance, *The Review of Economic Studies*, 85(3): 1609–1634.

Conlin, M., O'Donoghue, T., Vogelsang, TJ. (2007). Projection Bias in Catalog Orders, *American Economic Review*, 97(4), 1217–1249.

Croson, R., Anand, J., Agarwal, R. (2007). Using experiments in corporate strategy research. *European Management Review*, 4, 173–181.

de-Magistris, T., Gracia, A. (2016). Assessing Projection Bias in Consumers' Food Preferences. *PloS one*, 11(2), e0146308. https://doi.org/10.1371/journal.pone.0146308

Egan, P.J., Mullin, M. (2012). Turning Personal Experience into Political Attitudes: The Effect of Local Weather on Americans' Perceptions about Global Warming, *The Journal of Politics* 74(3), 796-809.

Gilbert, DT., Gill, JJ., Wilson, TD. (2002). The future is now: Temporal correction in affective forecasting. *Organizational Behavior and Human Decision Processes*, 88 (1): 430–444.

Hansen, PG., Jespersen, A.M. (2013). Nudge and the manipulation of choice. *European Journal of Risk Regulation,* 3, 3-28.

Lamp, S. (2018). Sunspots that matter: the effect of weather on solar technology adoption. Working paper Toulouse School of Economics, # 17-879.

Lilienfeld, SO, Ammirati, R., Landfield. K. (2009). Giving Debiasing Away Can Psychological Research on Correcting Cognitive Errors Promote Human Welfare? *Perspectives on Psychological Science,* 4(4), 390-398.

List, J.A., Shaikh, A.M., Xu, Y. (2019). Multiple hypotheses testing in experimental economics. *Experimental Economics*. 22 (4), 773-793.

Loewenstein, G., O'Donoghue, T., Rabin, M. (2003). Projection bias in predicting future utility. *Quarterly Journal of Economics*, 118: 1209-1248.

McLeish, K., Oxoby, P. (2009) Stereotypes in intertemporal choice. *Journal of Economic Behavior and Organization*, 70, 135-141.

Mullinix, KJ., Leeper, TJ., Druckman, JN., Freese, J. (2015). The Generalizability of Survey Experiments. *Journal of Experimental Political Science*, 2: 109-138.

Schubert, C. (2017). Green nudges: Do they work? Are they ethical? *Ecological Economics*, 132, 329-342.

Simonsohn, U. (2010). Weather to Go to College. *Economic Journal*, 120(543): 270-280.

Sunstein, CR. (2015). The Ethics of Nudging, *Yale Journal on Regulation*, 32(2), 413-450.

Weber, J. 1992. Scenarios in Business Ethics Research: Review, Critical Assessment, and Recommendations, *Business Ethics Quarterly*, 2(2), 137–159.

Appendix 1. Anonymous survey (identical for both versions T1 and T2) translated from French (For refereeing purposes only)

We are interested solely in your opinion. There are no good or bad answers. Thank you for responding as sincerely as possible.

Part 1

Solar energy provided by photovoltaic panels has several advantages: it is an inexhaustible energy since it comes from the sun's rays and, as a result, it respects nature and the environment. It is a very reliable energy because there is no risk of rupture. In addition, the integration of photovoltaic panels in homes is simple and the installation is easy to use.

Given the strong sunshine in Languedoc Roussillon (300 days per year on average) and government aids (eligibility for tax refunding at 30%), the installation of a photovoltaic panel may be profitable over 3 years.

1. According to you, in order to protect the environment, is it advantageous to invest in the purchase of solar panels?

- Not at all advantageous ☐
- Not very advantageous ☐
- Advantageous ☐
- Very advantageous ☐

2. Would you be willing to invest in the purchase of a solar panel?

- Very unlikely ☐
- Unlikely ☐
- Likely ☐
- Very likely ☐

Part 2

According to a study (CITEPA, 2015), cars are responsible for 35% of CO2 emissions, which pollute the atmosphere and are therefore blamed for causing the disruption of the ozone layer, as well as global warming. The CITEPA report concludes that the massive use of the car is harmful to our health and our environment.

To cope with this issue, green policies seek to raise awareness among citizens to adopt environmentally friendly means of transport, such as walking, cycling, public transport, etc.

1. According to you, in order to protect the environment, is it important to adopt environmentally friendly means of transportation?

- Not at all important ☐
- Not important ☐
- Important ☐
- Very important ☐

2. Would you be willing to go to your workplace with environmentally friendly transportation such as cycling, walking, or public transit?

- Never ☐
- Sometimes ☐
- Often ☐
- Every day ☐

CEE-M Working Papers[1] - 2020

WP 2020 - 01	Francisco Cabo & **Mabel Tidball** «Cooperation in a dynamic setting with asymmetric environmental valuation and responsibility»
WP 2020 - 02	**Mathias Berthod** «Commitment and efficiency-inducing tax and subsidy scheme in the development of a clean technology»
WP 2020 - 03	Manon Authelet, **Julie Subervie**, Patrick Meyfroidt, Nigel Asquith & Driss Ezzine-de-Blas « Economic, Pro-social and Pro-environmental Factors Influencing Participation in an Incentive-based Conservation Program in Bolivia »
WP 2020 - 04	Lesly Cassin Paolo Melindi Ghidi & **Fabien Prieur** « Confronting climate change: Adaptation vs. migration strategies in Small Island Developing States »
WP 2020 - 05	Victor Champonnois, & **Katrin Erdlenbruch** « Willingness of households to reduce ood risk in southern France »
WP 2020 - 06	Sophie Clot, **Gilles Grolleau** & **Lisette Ibanez** « The Reference Point Bias in Judging Cheaters »
WP 2020 - 07	Jean-Marc Blazy, **Julie Subervie**, Jacky Paul, François Causeret, Loic Guindé, Sarah Moulla, Alban Thomas & Jorge Sierra « Ex ante assessment of the cost-effectiveness of Agri-Environmental Schemes promoting compost use to sequester carbon in soils in Guadeloupe»
WP 2020 - 08	Sophie Clot, **Gilles grolleau** & **Lisette Ibanez** « Projection bias in environmental attitudes and behavioral intentions »

[1] **CEE-M Working Papers / Contact** : laurent.garnier@inra.fr

- RePEc https://ideas.repec.org/s/hal/wpceem.html
- HAL https://halshs.archives-ouvertes.fr/CEE-M-WP/