



Public Perceptions and Responses to Climate Change in France

Zakaria Babutsidze, Graham Bradley, Andreas Chai, Thomas Dietz, Robert Hales, Ezra Markowitz, Lionel Nesta

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Public Perceptions and Responses to Climate Change in France

Changement climatique : perceptions et réactions de la population en France

Babutsidze et al. 2018

Public Perceptions and Responses to Climate Change in France

Research Report

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Changement climatique : perceptions et réactions de la population en France

Rapport de recherche

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Executive Summary

Responding to climate change is the greatest challenge facing humanity today (IPCC 2014). Climate change poses risks for human and natural systems via processes such as water scarcity, land degradation, habitat and biodiversity loss, and extreme weather events. In Southern France, climate change has been directly linked to recent flooding and is projected to increase the future frequency of storms and heatwaves (Beniston et al. 2007). Understanding how citizens perceive and psychologically adapt to climate change is of great importance to developing a coherent and effective strategy to reduce carbon emissions and greater climate resilience.

This national survey represents the most comprehensive survey of national climate change attitudes in France to date. It presents and discusses national survey findings from a collaborative and cross-national research project undertaken by the Université Côte d'Azur and Griffith University (Australia) examining public risk perceptions, understanding and responses to the threat and unfolding impacts of climate change in France. The national survey was undertaken between June 5th and July 17th, 2017 and involved a representative, geographically and demographically stratified national sample of 3480 respondents across France.

The results provide an up-to-date and comprehensive profile of current French attitudes and beliefs about climate change, their concerns about the impact it may have on their economic well-being, health and natural surroundings, and the ways in which they are responding psychologically and behaviorally to this threat. This report also uncovers how economic conditions and natural weather events impact the evolution of climate change perceptions and attitudes. These results highlight that the design of public communication strategies in relation to climate change adaptation should take into account the nature of these public perceptions of climate change.

Résumé (in French)

Réagir face au changement climatique est le plus grand défi de l'humanité aujourd'hui (GIEC 2014). Le changement climatique expose les systèmes humains et naturels à des risques tels que la raréfaction de l'eau, la dégradation des sols, la perte d'habitat et de biodiversité, ainsi qu'à des phénomènes météorologiques extrêmes. Dans le sud de la France, un lien direct a été établi entre le changement climatique et les récentes inondations ; est également prévu une augmentation de la fréquence des tempêtes et des canicules. (Beniston et coll. 2007). Si nous voulons développer une stratégie efficace et cohérente pour réduire les émissions de CO₂ et favoriser une meilleure résilience climatique, il est essentiel de comprendre comment les citoyens perçoivent et s'adaptent psychologiquement au changement climatique.

Cette étude nationale est à ce jour l'étude la plus complète sur les attitudes vis-à-vis du changement climatique en France. Elle présente et examine les résultats du sondage national réalisé lors d'un projet concerté et transnational de l'Université Côte d'Azur et de Griffith University en Australie. Ce projet étudie la perception, la compréhension et les réactions à la menace et aux conséquences du changement climatique en France. Le sondage a été mené à l'échelle nationale du 5 juin au 17 juillet 2017 sur un échantillon représentatif stratifié à la fois géographiquement et démographiquement de 3 480 personnes interrogées à travers toute la France.

Les résultats dressent le profil le plus récent et complet des attitudes et des opinions des Français vis-à-vis du changement climatique, de leurs inquiétudes quant aux conséquences possibles sur leur bien-être économique, leur santé et leur environnement naturel, ainsi que leurs différentes réactions à cette menace, aussi bien d'un point de vue psychologique que comportemental. Ce rapport révèle également comment les conditions économiques et les phénomènes climatiques naturels influent sur l'évolution des perceptions et des attitudes face au changement climatique. Ces résultats montrent que les stratégies de communication publique sur l'adaptation au changement climatique devraient prendre en compte la nature que ce même public a de la perception du changement climatique.

Main findings

- **Belief and acceptance of climate change.** A large majority (85%) of respondents in this study indicated that they believe climate change is happening, with only one in fifty people (1.9%) indicating that they are not sure at all. Nine in ten respondents (90%) believe that climate change is either wholly or partly caused by human activity. The high prevalence of belief in the reality of climate change is consistent with findings from past surveys conducted in France and elsewhere.
- **Climate change deniers.** Climate change deniers only account for 2.5% of the sample. This low incidence is broadly in line with findings from past surveys. Climate change denial is positively correlated with age and inversely related to educational attainment. Small but important differences were found at the extreme ends of certain demographic groups of the sample. Deniers tended to be more highly concentrated in the youngest and oldest sub-groups of the sample, in those with very low and very high educational attainment, and in those who are unemployed or have very high incomes.
- **Environmental concerns and risk perceptions.** Around 85% of survey respondents expressed concern about the impact of climate change. Levels of concern and perceptions of the risks associated with climate change tended to increase with educational attainment. Risk perceptions were also relatively high among women, younger respondents, students, and the full-time employed. Current levels of climate change concern and risk perceptions are higher than those reported in previous studies. In addition, our data show high levels of concern regarding air, water, noise, soil, and (to a lesser extent) light pollution.
- **Exposure, experience, and perceived vulnerability.** 55% of respondents reported having had one or more direct experiences of extreme weather events such as storms, wildfires, droughts, and floods. This was in spite of most respondents residing more than 250 kilometers from an area frequently affected by extreme weather and natural disaster events. Indeed, most respondent did not perceive their region to be particularly vulnerable to such events. Reports of disaster experiences tended to be associated with high levels of climate change concern.

- **Connection to nature and “green” self-identity.** Many survey respondents reported high levels of connectedness with nature, with levels tending to increase with age, being relatively low among students and relatively high among those who are retired. Similar trends were apparent with respect to the adoption of a “green” identity. Levels of connection to nature and green identity were marginally higher than reported in similar past studies.
- **Climate change knowledge.** Responses to a set of six questions indicated that levels of factual knowledge of climate change were generally low to moderate. Knowledge of global climate change issues was greater than knowledge of France-specific climate change facts. On average, knowledge was relatively high among respondents in the 35-44 years age group and among those with mid-range educational qualifications. It was also relatively high among students, respondents who were employed full-time, and those who reported having had prior experiences of environmental changes, circumstances or events that might be due to climate change.
- **Psychological adaptation to climate change.** Respondents reported only moderate levels of psychological adaptation to climate change. However, data pertaining to one aspect of adaptation, the tendency to discuss climate change frequently with other people, ran counter to this trend, with respondents reporting frequent participation in climate change discussions. Adaptation tended to be greater among younger respondents and students than among relevant comparison groups. With the exception of those with doctoral degrees and those with very high household incomes, adaptation tended to increase in a linear manner with education and with income.
- **Attribution of responsibility to take climate change action.** Most respondents attributed the primary responsibility for taking climate change action to either private industries/companies, the international community, or national governments. Only one in eight respondents (12.75%) attributed responsibility to individuals and their families.

- **Self-efficacy.** The people's belief in their own capacity to mitigate the impacts of climate change was only moderate, and was arguably lower than previous studies. Self-efficacy was higher than average among female respondents, middle-income earners, and those who reported having had prior experience of environmental changes, circumstances or events that might be due to climate change.
- **Taking climate change action.** When presented with 14 possible actions to reduce the impact of climate change, respondents reported taking an average of 7.3 of these actions. Performance of these actions was relatively high among females, respondents aged over 45 years, the unemployed and the retired, and those who reported prior climate change experiences. Respondents also reported willingness to pay an extra 9.6% to purchase a product that was 50% more energy efficient than a competitor product.
- **The value-action gap.** We calculated a measure of the climate change “value-action gap”, that is, the standardized discrepancy between individuals' reported concern about the impact of climate change and the extent to which they engaged in actions to mitigate this impact. With positive scores on this index corresponding to more concern than action, we found relatively high gaps among students, respondents with household incomes between €75,000 and €100,000, and respondents who reported prior climate change experiences. Retirees tended to have low value-action gaps.
- **Barriers to actions.** The most frequently cited barriers to climate change action were (1) lack of knowledge as to what to do, (2) perceptions that the required actions are too expensive, and (3) beliefs that climate change is too big a problem for me/for one person/for an individual action to have any impact.
- **Regional differences in perceptions of climate change.** Public attitudes were shown to be very similar across the regions of France with respect to some dimensions, but to differ widely between regions in other respects. For example, whereas beliefs regarding the reality of climate change were quite uniform across the regions, considerable regional variability was evident in relation to climate change concerns (being relatively high in Paris and in the southern regions) and past

experiences of extreme weather events (being high in Corsica, Occitanie, and Nouvelle-Aquitaine). A clear implication is that public information campaigns need to take these regional differences into account.

- **Regional differences in climate change actions.** The data show several similarities and differences between regions in mitigation actions taken, barriers to taking climate change action, and the size of the value-action gap. For example, respondents residing in different regions varied in the extent to which they believed that barriers to action are posed by the inconvenience of climate change actions, the time cost involved, and the questionable necessity of taking such actions. These findings imply that the promotion of climate change action requires a set of intervention strategies that vary by region.

Principaux résultats (in French)

- **Changement climatique : croyance et acceptation.** Une grande majorité (85 %) des personnes interrogées au cours de cette étude ont affirmé être sûres que le changement climatique est une réalité alors que seulement une personne sur cinquante (1,9 %) a dit ne pas en être sûr du tout. Neuf personnes interrogées sur dix (90 %) pensent que l'activité humaine est entièrement ou au moins partiellement la cause du changement climatique. La proportion élevée de personnes convaincues de la réalité du changement climatique correspond aux résultats de sondages menés précédemment en France et ailleurs.
- **Négateurs du changement climatique.** Les négateurs du changement climatique ne constituent que 2,5 % de l'échantillon. Ce faible taux correspond en gros aux résultats d'anciens sondages. Le déni du changement climatique est manifestement lié à l'âge et inversement proportionnel au niveau d'éducation. Des différences, petites mais conséquentes, ont été relevées aux deux extrémités de certains groupes démographiques de l'échantillon. Les négateurs ont été trouvés en plus grand nombre dans les sous-groupes de l'échantillon à la fois les plus jeunes et les plus âgés, aux niveaux d'éducation les plus bas et les plus élevés et chez les personnes au chômage ou au contraire à très hauts revenus.
- **Inquiétudes liées à l'environnement et perception des risques.** Environ 85 % des personnes interrogées ont manifesté leur inquiétude face aux conséquences du changement climatique. Le degré d'appréhension et la perception des risques liés au changement climatique exprimés se sont montrés d'autant plus importants que le niveau d'éducation était élevé. La perception des risques est également relativement élevée chez les femmes, les plus jeunes, les étudiants et les employés à plein temps. De plus, le niveau d'inquiétude dû au changement climatique et la perception des risques sont plus élevés aujourd'hui qu'ils ne l'ont été dans le passé. En outre, nos données révèlent une inquiétude accrue à l'égard de la pollution de l'air, de l'eau, du bruit, des sols et, à moindre degré, de la pollution lumineuse.

- **Exposition, expérience et vulnérabilité perçue.** 55 % des personnes interrogées ont dit avoir vécu directement au moins une fois un phénomène météorologique extrême tel que tempête, feu incontrôlé, sécheresse ou inondation. Ceci, malgré le fait que la majeure partie des personnes interrogées vive à plus de 250 kilomètres d'une région fréquemment touchée par des phénomènes climatiques extrêmes ou des catastrophes naturelles. En effet, la plupart des personnes interrogées n'ont pas le sentiment que leur région est particulièrement exposée à de tels phénomènes. Les cas rapportés de catastrophes vécues ont tendance à être liés au degré d'inquiétude face au changement climatique.
- **Connexion avec la nature et égo-identité « verte ».** Un grand nombre de personnes interrogées se sont présentées comme étant profondément connectées à la nature, le degré de connexion étant proportionnel à l'âge, c'est-à-dire assez faible parmi les étudiants et relativement élevé parmi les retraités. L'adoption d'une identité « verte » suit une tendance comparable. Le degré de connexion à la nature et l'identité verte sont légèrement plus élevés que dans des études similaires conduites par le passé.
- **Connaissance du changement climatique.** Les réponses à une série de six questions ont montré que les niveaux de connaissances factuelles sur le changement climatique sont dans l'ensemble faibles à passables. On peut noter une meilleure connaissance des conséquences du changement climatique au niveau mondial que des phénomènes propres à la France. Dans l'ensemble, ce sont les personnes de la tranche des 35-44 ans et celles ayant atteint un niveau d'études intermédiaire qui ont fait preuve d'une connaissance comparativement bonne. De même, un niveau de connaissance assez étendu a été relevé parmi les étudiants, les employés à temps plein ainsi que les personnes ayant déjà témoigné de la détérioration de l'environnement ou vécu des situations ou phénomènes dus au changement climatique.
- **Adaptation psychologique au changement climatique.** Les personnes interrogées ont dit ne s'adapter psychologiquement que modérément. Or, les données relatives à l'un des aspects de l'adaptation, à savoir la tendance à souvent parler du changement climatique avec d'autres personnes, vont à l'encontre de ces

réponses. En effet, les personnes interrogées ont dit prendre souvent part aux discussions sur le changement climatique. C'est dans le groupe des plus jeunes et des étudiants que l'adaptation s'est révélée plus importante que dans d'autres groupes témoins. Le niveau d'adaptation a tendance à aller croissant selon le degré d'éducation et de revenus, à l'exception des diplômés de troisième cycle et des personnes à très hauts revenus.

- **Attribution de responsabilité de l'action face au changement climatique.** La plupart des personnes interrogées ont déclaré que les entreprises et industries privées, la communauté internationale ou les gouvernements nationaux étaient les principaux responsables à devoir agir face au changement climatique. Seulement une personne sur huit (12,75 %) a imputé cette responsabilité aux individus et leur famille.
- **Sentiment d'auto-efficacité.** Les réponses des personnes interrogées ont montré qu'elles croient ne pas être en mesure d'atténuer l'impact du changement climatique par leur action individuelle, et ce peut-être encore plus fermement que dans les études précédentes. Le sentiment d'auto-efficacité est au-dessus de la moyenne parmi les femmes, les personnes à revenus moyens et les personnes ayant déclaré avoir déjà témoigné de la détérioration de l'environnement ou vécu des situations ou phénomènes dus au changement climatique.
- **Agir face au changement climatique.** Présentées avec une liste de 14 actions possibles pour réduire l'impact du changement climatique, les personnes interrogées ont dit en accomplir en moyenne 7,3. Ces actions sont assez souvent réalisées par les femmes, les personnes de plus de 45 ans, les chômeurs et les retraités, ainsi que les personnes ayant déjà vécu des situations dues au changement climatique. Les personnes interrogées ont également affirmé être prêtes à payer un prix de 9,6 % plus élevé pour acheter un produit 50 % plus écoénergétique qu'un produit concurrent.
- **Écart valeurs — engagement vert.** Nous avons déterminé une mesure de l'*écart valeurs – engagement vert* pour le changement climatique, autrement dit du décalage entre le degré d'inquiétude exprimé par les individus face aux

conséquences du changement climatique et l'ampleur de leur engagement réel pour en atténuer l'impact. Avec des indices positifs indiquant plus d'inquiétude que d'engagement concret, nous avons trouvé des écarts assez importants parmi les étudiants, les personnes avec des revenus de 75 000 à 100 000 €, et celles ayant déjà vécu des situations dues au changement climatique. L'écart valeurs – engagement vert s'est révélé moindre chez les retraités.

- **Obstacles à l'engagement vert** Les obstacles à l'engagement vert les plus souvent cités ont été (1) le manque d'information pour savoir ce qui peut être fait, (2) l'impression que les actions nécessaires coûtent trop cher, et (3) le sentiment que le changement climatique est un problème trop important pour que les initiatives personnelles d'un seul individu aient un quelconque impact.
- **Différences régionales dans la perception du changement climatique.** De grandes similitudes ont été trouvées dans les attitudes de la population à travers les différentes régions françaises pour certains aspects, mais pour d'autres, les différences régionales sont importantes. Par exemple, alors que la réalité du changement climatique est apparue comme étant largement partagée sur tout le territoire français, des différences régionales notables sont manifestes concernant l'inquiétude face au changement climatique (comparativement importante à Paris et dans les régions du Sud) et les expériences vécues de phénomènes météorologiques extrêmes (importantes en Corse, en Occitanie et en Nouvelle-Aquitaine). Ceci implique clairement que les campagnes d'information publique doivent prendre ces différences en compte.
- **Différences régionales de l'engagement vert.** Les données montrent plusieurs similitudes et plusieurs différences entre les régions concernant les actions d'atténuation de l'impact, les freins à l'engagement vert et l'importance de l'écart valeurs – engagement vert. Par exemple, les résultats de l'enquête montrent que d'une région à l'autre, les personnes interrogées n'ont pas la même vision des causes faisant obstacle à l'engagement vert, de l'investissement en temps que cela exige et de la nécessité contestable d'agir. De tels résultats signifient que pour encourager l'engagement vert, il faut envisager des stratégies d'intervention différentes selon les régions.

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1. Introduction

Our response to climate change is the greatest challenge facing humanity today. Currently, natural and human environments are impacted by urban air pollution, water scarcity, land degradation, habitat and biodiversity loss, and extreme weather events (IPCC 2014). Economic impacts on Western European nations, including France, are likely to be substantial, especially if global mean temperatures increase by as much as 4° C (Aaheim et al. 2012). In Southern France, climate change has been directly linked to recent flooding and is projected to increase the frequency of storms and heatwaves (Beniston et al. 2007). Understanding how citizens perceive and psychologically adapt to climate change is of great importance to developing a coherent and informed strategy to reduce carbon emissions and enhance climate resilience.

The behavior of individual citizens takes center stage in this effort as it is both a major cause of – and a potential solution to – rising Green House Gas (GHG) emissions. The voluntary adoption of GHG mitigation practices, such as insulating houses, taking public transport, and using fluorescent light bulbs, has the potential to reduce direct household carbon emissions by as much as 20% in the United States (Dietz et al. 2009). As a result, a number of authors have called for actions from the side of individuals and the private sector (e.g., Vandenberg and Gilligan 2017). Yet, in spite of most citizens reporting a deep concern about climate change, a key barrier to climate change adaptation is that consumption habits are path dependent and difficult to change (Sanne 2002; Maréchal 2010).

The main objective of this exercise was to study how the French public perceives and has psychologically adapted to climate change. The study ascertained how the French population's actual exposure to real events as well as the climate change debate in the media affected their emotions, beliefs and knowledge about climate change. Based on this, the study also examined the extent to which these factors have led to changes in behavior that help mitigate the impact of climate change. Behavioral barriers to climate change mitigation and adaptation were also explored in the study. Understanding such trends is crucial to formulating both an effective strategy to communicate climate change issues to the French public across various social groups and regions, as well as developing an appropriate national climate policy plan that can meet the priorities and concerns of French citizens.

To date, scant attention has been paid to establishing a national database and monitoring program addressing important changes and impacts of climate change (Brechtin 2010; Garnaut 2008; Leviston and Walker 2012). In addition, little consideration has been given to the more ‘human’ (i.e., psychological, social, economic, geographic) dimensions of climate change and how these affect public understanding, concerns, responses and impacts. The current study provides contemporary insights into these issues.

We urgently need a deeper understanding of a great behavioral paradox facing society known as the ‘value-action’ gap: why, **in spite of deeply held and widely expressed concerns** about climate change, do citizens not act on these concerns by adopting common greenhouse gas mitigation practices? Survey after survey conducted around the world suggest that most individuals do accept that climate change is real and most express at least some level of concern about it (Uzzell 2000; Krosnick et al. 2006; Brechtin and Bhandari 2011; Reser et al. 2012a, 2012b). Yet, there appears to be a major gap between these environmental concerns and the propensity to act on these concerns by adopting sustainable consumption practices (Gifford 2011).

What psychological, social and economic factors work to inhibit pro-environmental values being translated into action? How does the citizen’s propensity to engage in mitigation practices evolve as a result of experiencing extreme weather events, such as storms, that are linked to climate change? What is the relationship between such concerns and the citizen’s income, their work/life balance and their social environment? A more comprehensive answer to these questions will help develop new types of social information campaigns and policy measures designed to effectively achieve behavioral change and the voluntary adoption of climate change mitigation measures by the wider population. The large national online survey described in this report was undertaken to address these issues.

The report is organized as follows. After an overview of the survey methodology (Chapter 2), we present the major findings in three chapters: Chapter 3 describes findings pertaining to the respondents’ perceptions of climate change, Chapter 4 reports findings pertaining to climate change actions, and Chapter 5 examines regional differences and similarities in relation to the key survey questions. Finally, in Chapter 6, conclusions and recommendations from the study are presented.

2. Description of Survey Respondents

The survey was conducted by Qualtrics using a panel of nationally representative respondents. At the onset of the survey the following criteria were matched with the most recent French census data: gender, age, education, residence type and the geographic region (13 regions of France).

Due to the large variation in population sizes across the 13 regions, the sampling strategy consisted of first targeting the least populous regions and then progressively addressing the more and more populous regions. This strategy maximized the likelihood of matching the hardest criterion – the distribution of respondents across the regions. Additional weight was placed on one region – Provence-Alpes-Côte d’Azur – which is of a particular interest for the study.

The survey was undertaken between June 5th and July 17th, 2017. Respondents were recruited through various Qualtrics panels and were remunerated through diverse incentive schemes that were managed by the survey company.

A total of 5927 complete responses were collected. The data went through rigorous quality checks. Several filters for quality control were implemented. For example, the filter for response duration disqualified all observations that were completed in less than 1/3 of the median response time. Similarly, three sets of related questions were included in the questionnaire and enabled detection of incoherence in responses (e.g., in one question respondents were asked whether they had any experience with natural disasters, while another question asked them to state how many natural disasters they have experienced. In this set-up, an answer of “Yes” to the first question and the answer of “0” to the second question would indicate incoherence). Other filters included the match between the responses to a question about residence type (urban/suburban/rural) and a question about the distance of their residence from the closest public transport station, a direct request to choose a particular response from the provided options, as well as the match between reported region of residence and postcode. On top of this, straight-lining checks were performed on questions with a number of sub-questions. Every observation that failed even one of the filters was eliminated.

After data filtering the sample size was reduced to 3480 (58.7% of the original sample) high-quality observations. The mean duration of questionnaire response time was 27 minutes. 52.7% of respondents were female. 22.6% of the sample came from rural areas

Table 2.1 Sample characteristics

Panel A: Distribution of educational level	Number	Percent
Less than high school	562	16.29
High school diploma	951	27.56
Some college	932	27.01
College degree	419	12.14
Master's degree	468	13.56
Doctoral degree	69	2.00
Other	50	1.45
Total	3451	100

Panel B: Distribution of age	Number	Percent
18 to 24 year olds	543	15.60
25 to 34 year olds	667	19.17
35 to 44 year olds	641	18.42
45 to 54 year olds	641	18.42
55 to 64 year olds	589	16.93
Older than 64 years	399	11.47
Total	3480	100

Panel C: Distribution of income (per annum)	Number	Percent
Less than 25k euros	1313	37.73
Between 25k and 50k euros	1568	45.06
Between 50k and 75k euros	421	12.10
Between 75k and 100k euros	115	3.30
Between 100k and 200k euros	52	1.49
Above 200k euros	11	0.32
Total	3480	100

and 25.7% came from suburban areas, while the remaining 51.7% of the sample resided in urban settlements. Age distribution corresponds well with 2016 census numbers reported by INSEE¹. However, the sample is somewhat biased towards the rural population.

Table 2.1 provides the distributional characteristics of our sample in terms of education, age and income. Again, these numbers are broadly in line with overall French population data provided by INSEE. However, there are a few exceptions. Our data slightly over-sample both the least (less than college degree) and the most (doctoral degree) educated populations. The data are also somewhat biased, with higher income populations being under-represented and younger individuals over-

¹ <http://www.insee.fr>

Table 2.2 Residential location of respondents

Region	Number of respondents	Percent of the sample	Percent of population *
Auvergne-Rhône-Alpes	393	11.29	12.25
Bourgogne-Franche-Comté	147	4.22	4.39
Bretagne	183	5.26	5.13
Centre-Val de Loire	137	3.94	4.02
Corse	13	0.37	0.51
Grand Est	288	8.28	8.65
Hauts-de-France	290	8.33	9.35
Île-de-France	664	19.08	18.78
Normandie	177	5.09	5.19
Nouvelle-Aquitaine	287	8.25	9.19
Occitanie	291	8.36	9.01
Pays de la Loire	197	5.66	5.78
Provence-Alpes-Côte d'Azur	413	11.87	7.76
Total	3480	100	100

Note: *Data based on the latest French census obtained from www.insee.fr

represented compared to the French population. Respondents under the age of 35 are over-represented by as much as 10%, and respondents over the age of 64 are under-represented by about the same amount. These features reflect the online nature of the questionnaire.

The distribution of respondents across 13 geographic regions is presented in Table 2.2.

The distribution of respondents across regions correlates almost perfectly with that of the French population according to the EUROSTAT² data from 2017. With the notable exception of one region, Provence-Alpes-Côte d'Azur, which is over-represented by almost four percentage points (in reality, the PACA population constitutes about 8% of the French population).

However, over-sampling this region was a deliberate decision, as PACA represents a region of particular interest for the current study. As a result of over-sampling PACA, four other regions are slightly under-represented in our sample. These are Corsica (0.5%), Hauts-de-France (9%), Nouvelle-Aquitaine (9%) and Occitanie (9%). Each of these regions is lacking one percentage point in our sample. The only region where we were not able to obtain a satisfactory number of observations was Corsica.

² <http://ac.europa.eu/eurostat>

3. Perceptions of Climate Change

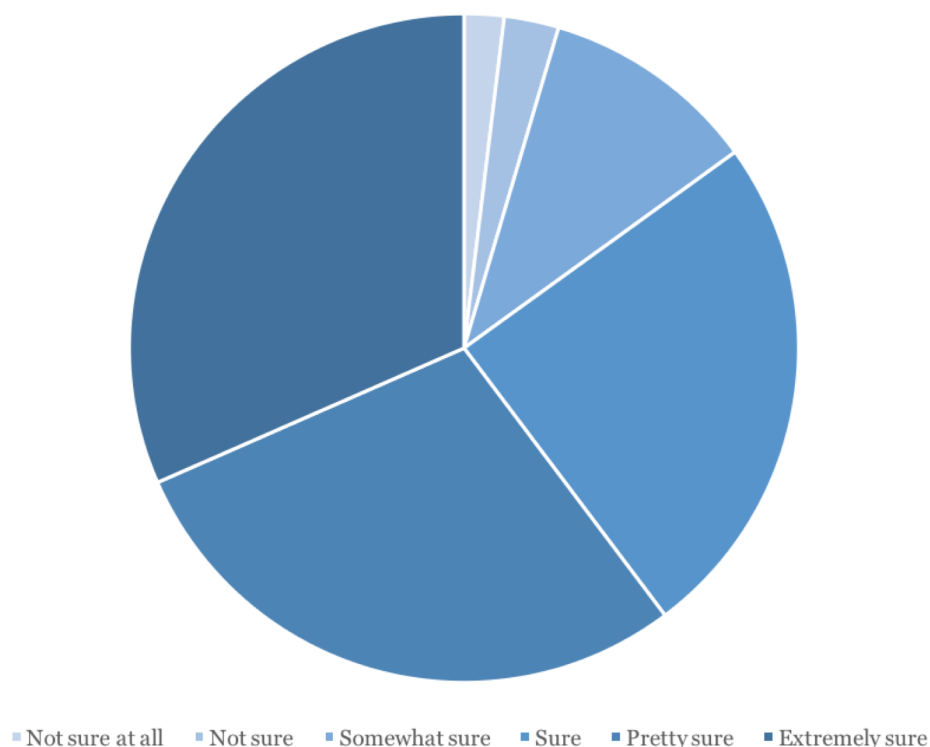
This section reports respondents' views of climate change, including details of their climate change-related experiences, concerns, and knowledge. Where available, comparisons are made between the current findings and those obtained by similar past research. Caution is needed in interpreting these comparisons because the findings not only emanate from different nations, but also from different years (and questions asked in past years may not still be important), using different administration modes (e.g., online questionnaires vs. telephone interviews), question wording, and response formats. Each of these factors could contribute to the differences in findings.

3.1 Belief and acceptance of climate change

Do people think that climate change is “fake news”? In this regard, the survey results suggest that most French people believe that climate change is real. In response to the question “How sure are you that climate change is happening?”, approximately 85% of the respondents were either sure, very sure, or extremely sure. Only 1.9% were not sure at all. If we assign an index ranging from 1 to 6, with 1 corresponding to “Not sure at all” and 6 corresponding to “extremely sure”, the mean of the sample is 4.7. These responses point to a high level of certainty about climate change in the current French sample. See Figure 3.1.

Similar levels of certainty of beliefs in climate change have been found in past surveys. For example, the European Perceptions of Climate Change (EPCC), a 2016 interview-based survey of around 1000 people in each of four European nations (EPCC 2017), found that most people believed that climate change is happening. The exact percentages of EPCC respondents holding this view, in each country, were: France (92%), Norway (93%), Germany (83%), and UK (86%). The 85% of the current sample who reported believing that climate change is happening is consistent with, albeit towards the upper end of, the percentages found in other parts of the world. For example, percentages of past survey samples that believed climate change is happening have ranged from 71% to 91% in Australia (Climate Institute 2017; Leviston et al. 2014; Reser et al. 2012a, 2012b; Sustainability Victoria 2017), from 69% to 83% in the U.S.

Figure 3. 1 Level of certainty about climate change



(Howe et al. 2015; Krosnick and McInnis 2011; Yale Project on Climate Change Communication 2012), and 78% in the UK (Spence et al. 2010).

Certainty that climate change is happening tended to decrease slightly with age ($r = -0.11$, $p < 0.001$), and increase slightly with education ($r = 0.13$, $p < 0.001$). Certainty of climate change beliefs varied little with gender, marital status, employment status, and income. Similar differences in beliefs in climate change by demographic variables have been found in several studies conducted elsewhere in the world. In Australia, for example, Reser (2012a, 2012b) found that the correlation between climate change beliefs and age was $r = -0.12$ (in 2010) and $r = -0.14$ (2011), and that between climate change beliefs and education was $r = 0.11$ (in 2010) and $r = 0.08$ (2011). In Australia, but not in the current French study, females tended to be more certain of the reality of climate change than males.

Only 1.9% of French people surveyed reported being not at all sure about whether climate change is happening. Using a similarly-worded question, Reser et al. (2012a, 2012b) reported that 7.8% (in 2010) and 7.6% (in 2011) of their Australian samples were unsure as to whether climate change was occurring. A recent study by Hornsey et

al. (2018) shows a slight correlation between climate change skepticism and political ideology. While in many countries (including U.S., Canada, Portugal and Poland) being a conservative is associated with higher likelihood of also being a climate change skeptic/denier, France (along with South Korea and India) shows a weak (and non-significant) association between liberalism and climate skepticism.

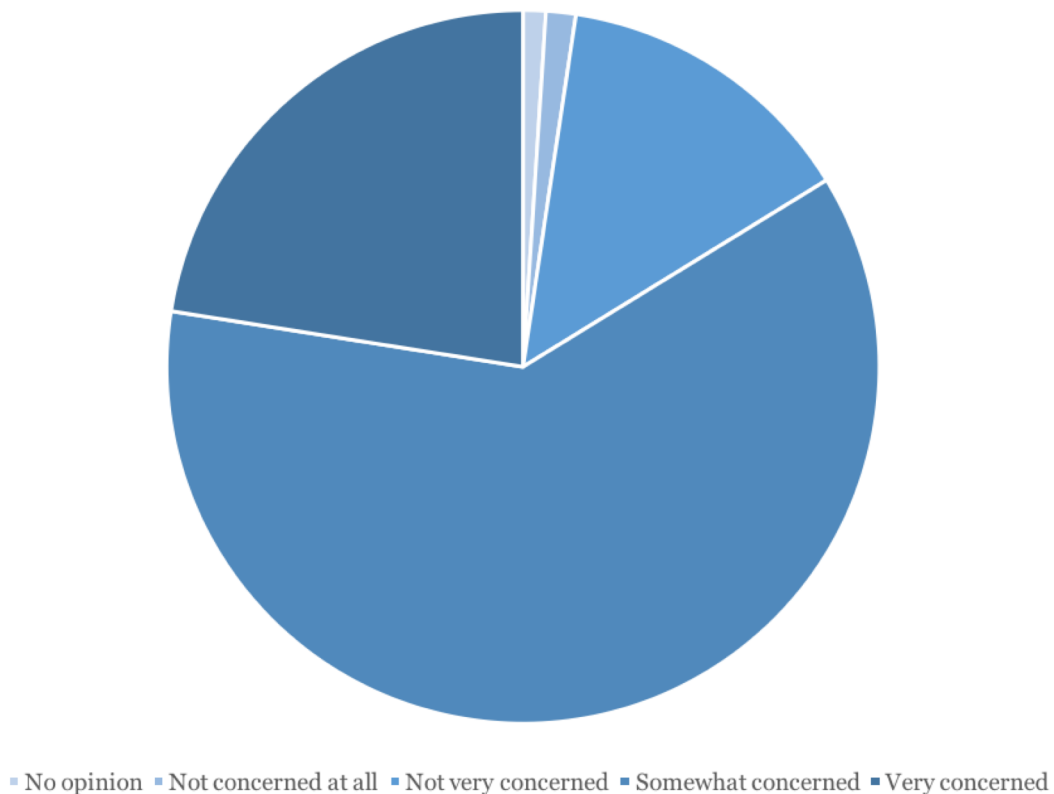
In response to a further survey question regarding the potential causes of climate change, nearly all (95.9%) respondents attributed the cause to more than just natural processes. More specifically, 32.8% of respondents believe climate change is partly caused by natural processes and partly caused by human activity, 43.2% believe it is *mainly* caused by human activity, and 16.7% believe it is *entirely* caused by human activity. This indicates that the current sample has strong certainty about not just the reality of climate change, but also its causal factors. This is consistent with findings from the EPCC (2017) study in which 95% of French respondents claimed climate change is real and at least partly due to human activity, compared to the percentages reported for Norway (95%), Germany (90%), and UK (93%). Slightly lower percentages have been reported elsewhere: for example, the percentages of respondents who included human factors in their understanding of the causes of climate change were 90.2% (2010) and 82.9% (2011) of Australian respondents in Reser et al.'s (2012a, 2012b) studies, and 89.3% of Spence et al.'s (2010) UK sample.

3.2 Levels of public concern

In addition to accepting the existence of climate change, the overwhelming majority of the current sample expressed concern about the personal impact of climate change. Approximately 85% of respondents reported feeling somewhat or very concerned (see Figure 3.2). Findings are broadly consistent with past research: for example, while 15.4% of the current sample were either not concerned at all or not very concerned, Tranter and Booth (2015) report that 13% of the 2,137 French respondents to the 2010-2011 ISSP survey displayed similarly unconcerned attitudes.

When an average score was calculated for responses to this question, the mean was 3.06 on a 4-point scale that excluded those with no opinion. Levels of concern did not vary greatly with any of the demographic variables. The strongest relationship was with educational attainment, where average levels of concern tended to increase steadily

Figure 3. 2 Level of concern about climate change



from those without a Baccalaureate (mean = 2.97 on the 4-point scale) to respondents holding master's degrees (mean = 3.14), and then decrease slightly among those holding doctoral degrees (mean = 3.03).

Past research conducted in Europe provides an opportunity to compare levels of climate change concern/worry in France with that reported in neighboring countries. For example:

- The 2017 Eurobarometer survey on climate change (European Union 2017) captured the views of 21,901 people from 34 nations. This survey found that 92% of respondents regarded climate change as a *serious* problem and almost three-quarters (74%) regarded it as a *very serious* problem. The corresponding percentages for the French members of this sample (N = 1,004) were 96% and 79%, with evidence that these percentages of concerned French citizens had increased quite sharply in the two years since 2015.
- The 2002 EORG survey (cited in Lorenzoni and Pidgeon 2006) found that 44% of French respondents were “very worried” about climate change, compared to the European average of 39%.

- In the 2017 EPCC study, French respondents reported higher levels of worry about climate change than respondents from any of the other three nations surveyed: in France, 41% were very or extremely worried, and only 5% were not worried at all. These percentages can be compared with those obtained in Germany (30% and 8%), Norway (29% and 4%), and the UK (20% and 15%). From these comparisons, it is clear that members of the current sample are reporting higher levels of concern/worry than have been reported in past research conducted in European nations.

Comparisons can also be made with other western nations. In general, relatively high proportions (59-78%) of respondents in recent Australian surveys have reported at least moderate levels of concern or worry about climate change (Climate Institute 2017; Leviston and Walker 2012; Morrison et al. 2013; Reser et al. 2012a, 2012b; Sustainability Victoria 2017). A similar proportion (71%) of British respondents reported high levels of concern in Spence et al.'s (2010) study. In U.S. samples, 56% (Howe et al. 2015) and 63% (Yale Project 2017) reported being worried. An even greater percentage of U.S. respondents believed that climate change will hurt or harm future generations (69%) and plants and wildlife (68%) (Howe et al. 2015). However, research using the same questionnaire item as the present has tended to report somewhat lower average levels of climate change concern than the current mean of 3.06: for example, in the UK, Spence et al. (2010) obtained a mean score of 2.92, while in Australia Reser et al.'s (2012a, 2012b) mean concern ratings were 2.87 (2010) and 2.78 (2011). In sum, when compared with the 85% of our respondents who are somewhat or very concerned, it seems that the current sample, and French people more generally, report higher levels of concern about climate change than is generally expressed in other western nations.

3.3 Exposure, disaster experience and vulnerability

This section reports findings pertaining to four topics examined in our questionnaire, namely, (1) perceptions of residential exposure to extreme weather events, natural disasters and climate change impacts, (2) prior direct experiences of natural disasters and extreme weather events, (3) concerns over exposure to pollution of various types,

and (4) perceptions of the overall risk imposed by climate change to oneself and one's region.

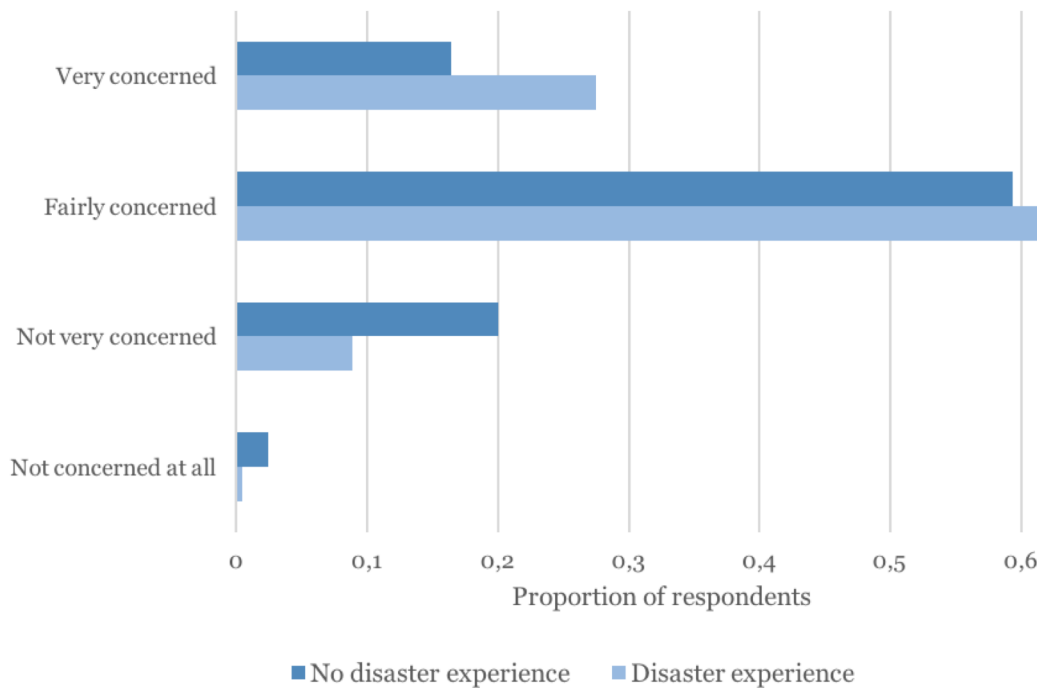
Respondents were asked to indicate the distance they lived from “areas frequently affected by extreme weather events or natural disasters.” In response, 10.9% indicated they resided within 25 kilometers of such areas, 8.2% lived within 25-50 kilometers, 11.5% lived within 51-100 kilometers, 14.4% lived within 101-250 kilometers, and the majority (55%) lived more than 250 kilometers from such areas. These levels of perceived residential exposure to extreme weather events or natural disasters are lower than those reported in surveys of Australian residents (Reser et al. 2012a, 2012b).

Similar questions were asked regarding perceptions of regional vulnerability to (1) natural disasters and (2) the impacts of climate change. Responses to both questions were required on 6-point scales from 1 (not vulnerable) to 6 (very vulnerable). The average score for the first question was 3.22, and the average for the second question was 3.49. Mean scores in response to the same items included in Australian surveys were approximately 3.7 and 3.6, respectively (Reser et al. 2012a, 2012b). Thus, whilst the average level of perceived vulnerability is quite high in both countries, it is somewhat higher in Australia.

Respondents were also asked to rate, on a 6-point scale from very poor (1) to excellent (6), the “condition of the natural environment” in their region of France. Responses were distributed as follows: 1 (2.9%), 2 (9.6%), 3 (32.6%), 4 (43.0%), 5 (11.0%), and 6 (0.8%). The mean of 3.51 compares with means of 4.12 and 4.11 in two Australian surveys that asked the same question (Reser et al. 2012a, 2012b), indicating that our French respondents viewed the condition of the natural environment in their region quite negatively. The rather pessimistic views implied in the ratings given by members of the current French sample are consistent with data reported by Gifford et al. (2009) that showed that both the objective and the perceived condition of the environment in France, although slightly superior to that of the USA, was not as good as that in many other developed nations including Australia, Canada, and the Scandinavian countries.

In our survey, respondents were asked whether they had “directly experienced noteworthy change, circumstances, or events ... which might be due to climate change (e.g., storms, floods, droughts).” A majority, 1913 people or 55% of all survey

Figure 3.3 Disaster experience and climate change concern

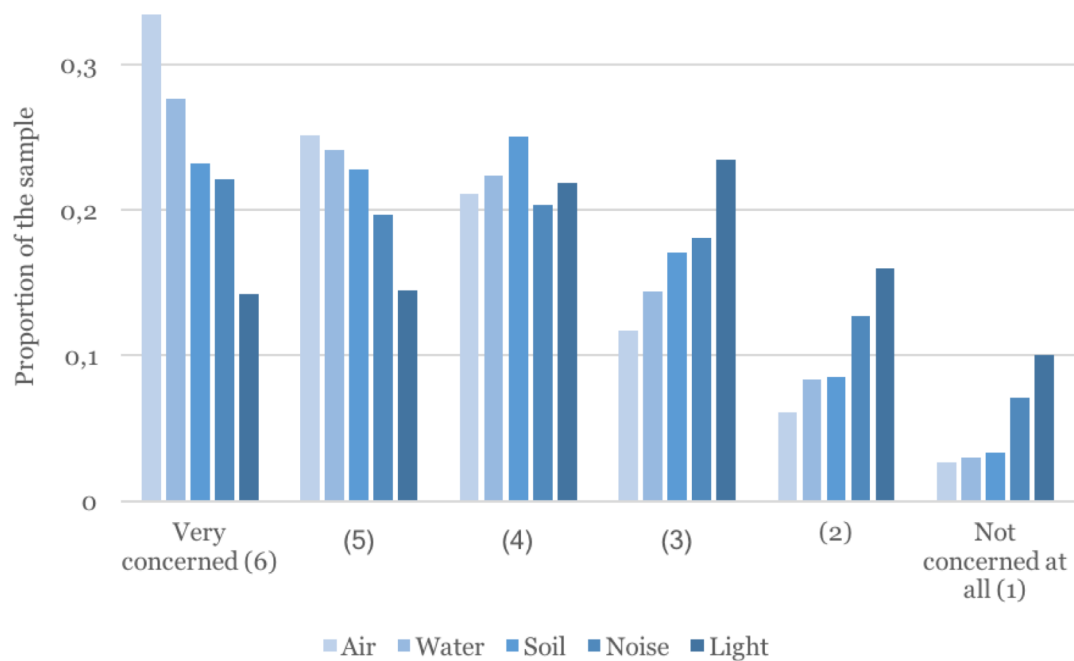


respondents, responded in the affirmative. More specifically, of those who had had any such experiences, 63.8% reported having experienced extreme storms, 37.6% had experienced wildfires, 81.7% had experienced drought, 65.1% had experienced flooding, and 12.8% had experienced some other extreme weather event.

To what degree did disaster experience play a role in driving concern about climate change? Levels of climate change concern among the subgroup of respondents who had prior experience of extreme weather events were considerably higher than among those who reported no such experience (see Figure 3.3). That said, it is worth noting that the groups of respondents with and without prior experience of major weather events were similar in the sense that more than three-quarters of both groups expressed medium or high levels of concern about climate change.

While disaster experience is shown to be positively related to environmental concern in France, prior experiences of natural disasters and extreme weather events were unrelated to climate change concerns or beliefs in Reser et al.'s (2012a, 2012b) Australian research. The reason for this discrepancy is difficult to discern, although one possibility relates to differences in the nature and extent of respondents'

Figure 3. 4 Concern across different types of pollution

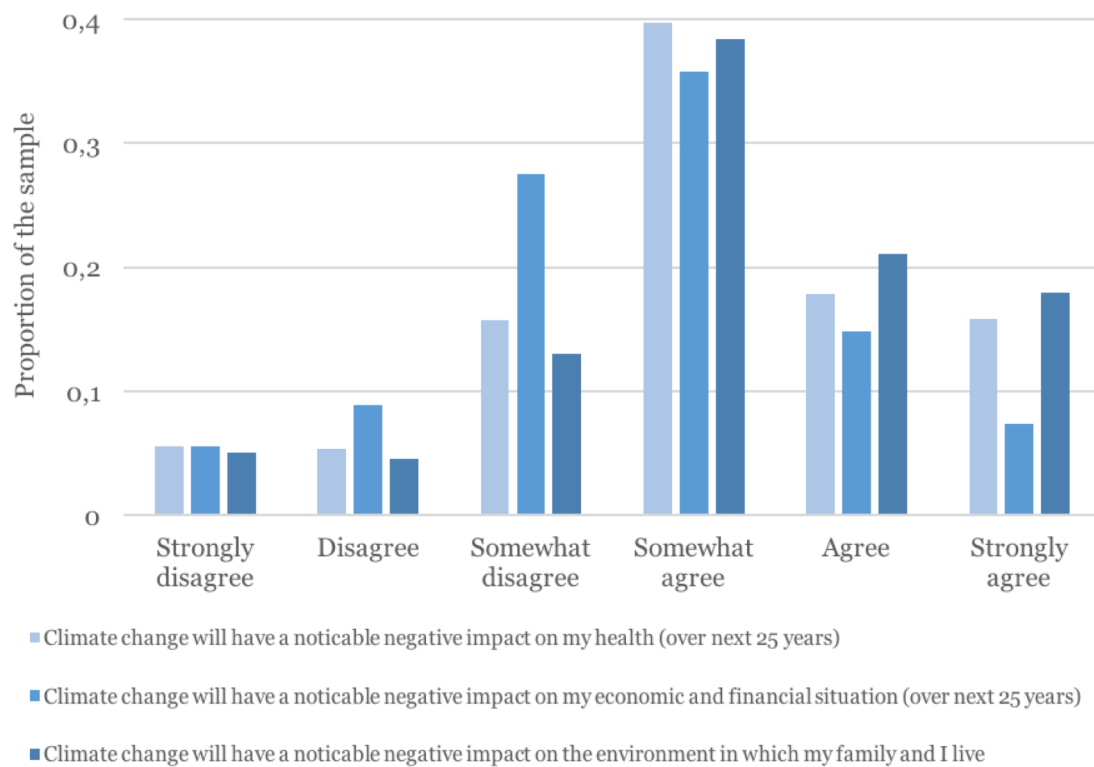


experiences in these two nations: for example, 64% of the current sample (versus only 29% of Reser et al.'s 2011 sample) had experienced flooding in their lifetime.

Further items covered concerns about five types of pollution: air, water, soil, noise, and light. Findings are summarized in Figure 3.4. As shown, a high proportion of respondents expressed concern about most types of pollution, with the possible exception of light pollution. Air pollution aroused the most concern.

Respondents completed Kellstedt et al.'s (2008) six-item climate change risk perception scale. The items in this scale assess the extent to which respondents perceive climate change to be a risk to themselves (3 items) and to their region (3 items). Responses are required on a 6-point scale, with higher scores indicating greater perceived risks associated with climate change. Figure 3.5 shows the responses given to the three items relating to perceptions of risk to aspects of the respondent him/herself. As shown, most respondents agreed that climate change will have a noticeable negative impact on their environment and personal health, however there was marginally less concern about the impact of climate change on their economic and financial circumstances.

Figure 3.5 Climate change risk perceptions



The average response to all six risk perception items was 3.98 on the 6-point scale. This average response is marginally higher than that obtained in past Australian research (mean = 3.78; Reser et al. 2012a). In the current study, perceptions of climate change risks were somewhat higher in women (mean = 4.04) than in men (mean = 3.91), higher in respondents aged less than 55 years (mean = 4.03) than in older respondents (mean = 3.85), higher among those with most post-school qualifications (mean = 4.03) than among those with lower educational attainment (mean = 3.94) or PhDs (mean = 3.72), and higher among students (mean = 4.05) and the full-time employed (mean = 4.02) than among other groups (means all less than 4.0). Risk perceptions did not differ significantly with income or marital status.

3.4 Connection to nature and “green” self-identity

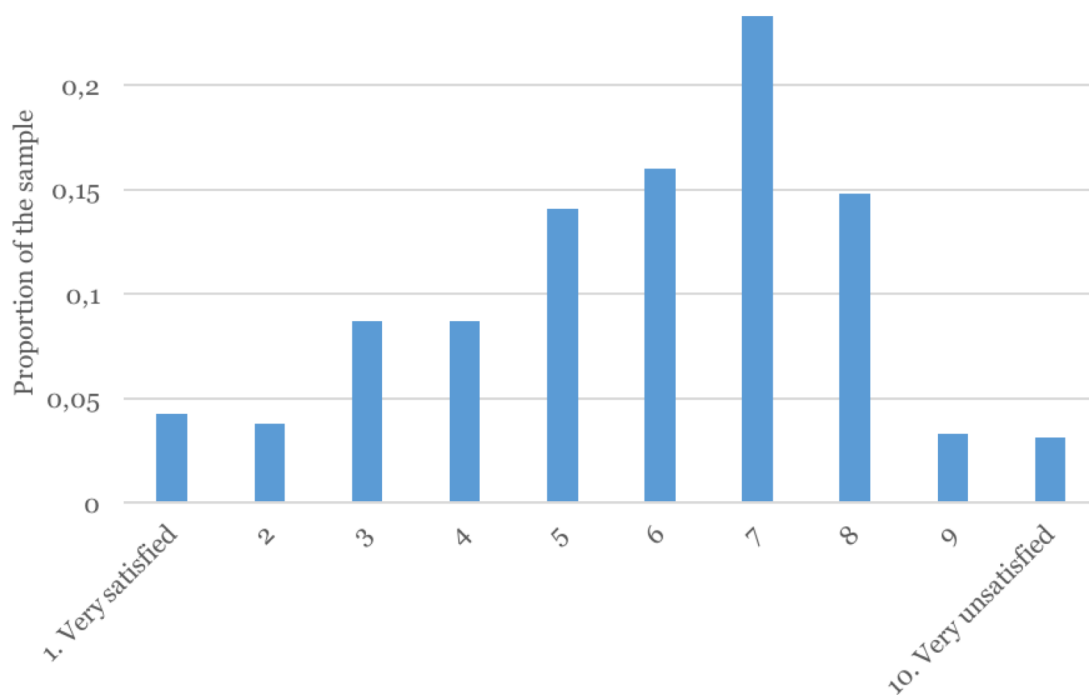
In addition to assessing the demographic characteristics of the sample, several sets of items explored individual respondents’ social psychological make-up from an ‘environmental’ perspective. Survey respondents responded to six items assessing the

extent to which they feel connected to nature (Gosling and William, 2010; Mayer and Frantz, 2004). A sample item is “I often feel that I am a part of nature”. Responses to these items are on a 6-point scale and can be averaged to provide a total score with higher scores indicating greater connections with nature. The mean response on this scale was 4.51. This is slightly higher than that obtained by Reser et al. (2012a) in Australia (mean = 4.31). In the current study, having a sense of connection to nature tended to increase with age, being lowest in those aged less than 25 years (mean = 4.26) and highest in those aged over 55 years (mean = 4.68). Consistent with this, connection to nature was lower among students (mean = 4.26) than among the retired (mean = 4.66). Connection to nature did not vary with gender, education, or income.

Respondents also responded to three items developed by Spence et al. (2010) that assessed the extent to which respondents self-identified as environmentally-friendly, or “green”. A sample item is “I think of myself as someone who is very concerned with environmental issues”. Responses were averaged to provide a total score with higher scores indicating a stronger green identity. The average score was quite high at 4.55 on the 6-point scale, and higher than that reported in past UK and Australian research (means = 3.38 to 3.48, but these studies used a 5-point response scale). In the current sample, a green identity was more strongly reported by respondents aged over 45 years and the retired (both means = 4.63) than among younger respondents (mean = 4.46) and students (mean = 4.43). Gender, educational attainment, and income were not related to reports of having a green identity.

Finally, in this section, respondents responded to a single item assessing, on a 10-point scale, their current level of life satisfaction. This item enabled assessment of the possible impacts of environmental concerns and actions. The mean response was 7 out of 10, where 1 represented “not very satisfied” and 10 represented “very unsatisfied”. This relatively low level of happiness is consistent with results in the World Happiness Report 2016 that found evidence of high levels of pessimism among the French public (Sachs et al. 2016).

Figure 3. 6 Life satisfaction



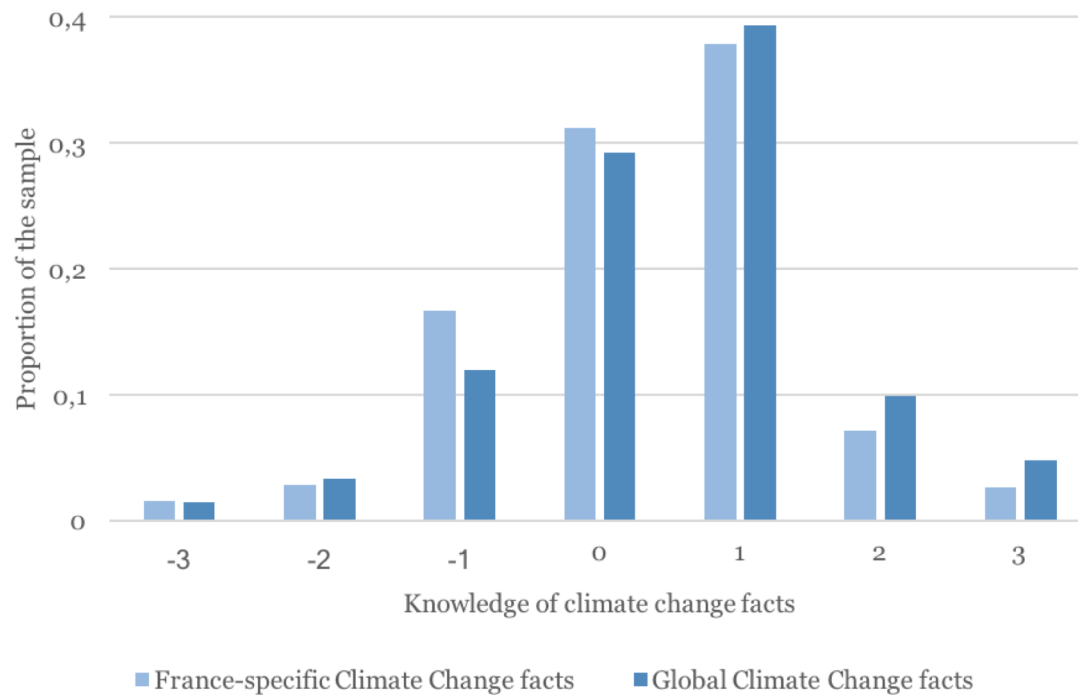
3.5 Knowledge of climate change

Beyond a concern about climate change, a further set of six questions assessed how well-informed people are about climate change. In this regard, we asked respondents a set of six questions to determine their knowledge of factual information about climate change. An index measure of climate change knowledge was created by summing correct responses and subtracting the number of incorrect ones. This variable is confined to the interval $[-6; 6]$, where -6 indicates the lowest possible level of knowledge (six incorrect answers to the questions asked) and 6 indicates the perfect knowledge (six correct answers).

The mean value of this variable in our sample is 0.84 , with a standard deviation of 1.7 , which is comparable to Australian results (Reser et al. 2012a). A total of 292 people (17.2% of the sample) scored below zero, meaning that they answered more questions incorrectly than correctly.

Two auxiliary variables were created. One measured respondents' knowledge of climate change facts specific to France, and the other measured knowledge of climate change globally. Both of these variables are confined to the interval $[-3; 3]$. Figure 3.7

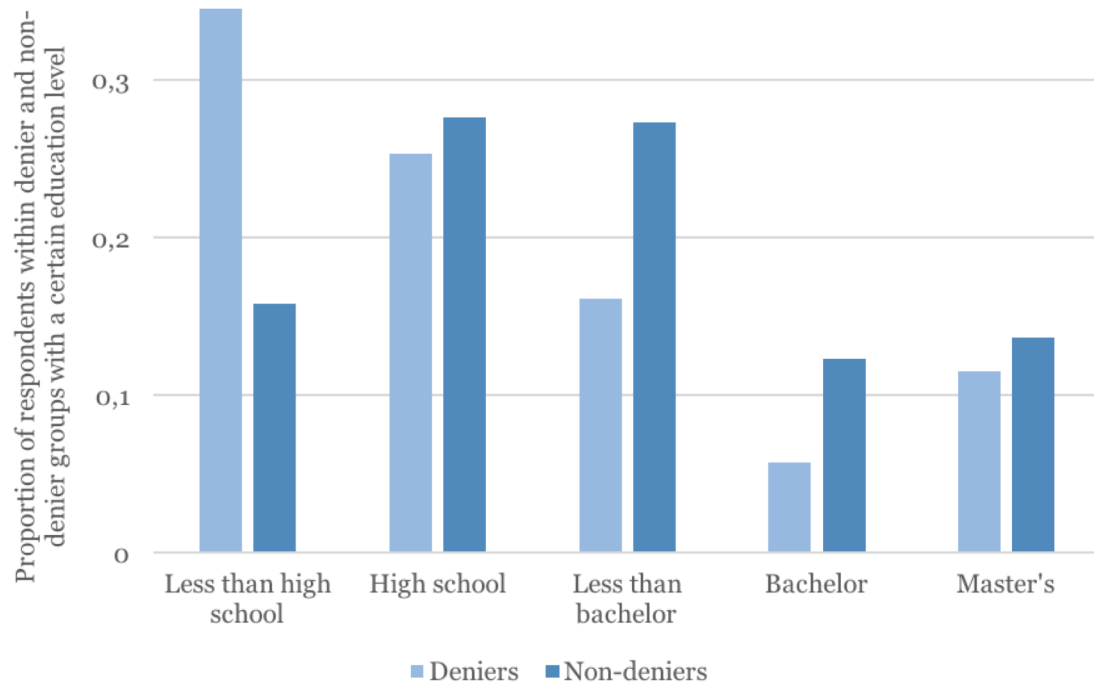
Figure 3. 7 Knowledge of climate change facts



indicates that this sample of French citizens is somewhat more knowledgeable regarding *global* climate change, than regarding *France-specific* facts. This is perhaps due to more intense media coverage received regarding the global climate change challenges.

Mean levels of climate change knowledge peaked in the 35-44 years age group (mean = 0.96) and declined thereafter, reaching a minimum in the over 65 years group (mean = 0.61). The effect of education was positive but small: knowledge was highest (mean = 0.97) among respondents who had completed a Baccalaureate plus two further years of study, and lowest in those who did not hold a Baccalaureate (mean = 0.64). The average increased from 0.83 to 0.88 if we separated the sample into respondents without and with a bachelor's degree. Students (mean = 0.91) and the full-time employed (mean = 0.92) displayed greater knowledge than did respondents who were retired (mean = 0.60). However, the largest effect on knowledge was in relation to prior experiences of climate change-related weather events: mean knowledge levels were significantly higher among respondents who reported having had such experiences (mean = 0.99) than among those who had not (mean = 0.65). Neither gender nor income level played any role in terms of knowledge.

Figure 3. 8 Climate change deniers by educational attainment

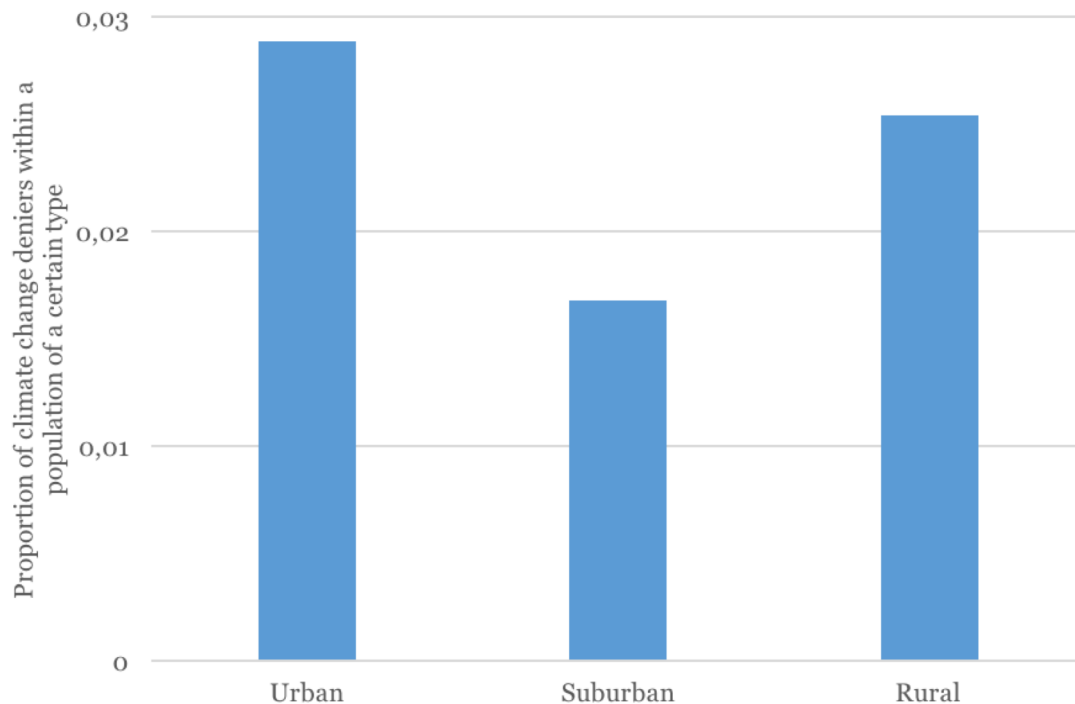


All in all, it seems that the knowledge of climate change facts is fairly low in France. This is true for the facts related to the global knowledge of climate change, as well as for the facts related specifically to France. This suggests that two of the most efficient media to increase public engagement in adaptation efforts might be educational policies and information campaigns (for example, Geiger et al. 2017).

3.6 Climate change deniers

There has been quite a lot of focus on climate change deniers in the United States, the United Kingdom, Australia, and elsewhere. As with Australian, UK, and US samples, a distinct minority of French respondents, approximately 2.5%, could be characterized as being disbelievers or strong skeptics with respect to the reality of climate change and/or the causal role of human activities and environmental impacts. This compares with Reser et al.'s (2012 a, 2012b) Australian figures of between 3.0% and 6.5% (in 2010) and between 4.7% and 8.5% (in 2011), depending on the stringency of the criteria used. Tranter and Booth (2015) provide evidence that rates of climate change skepticism in 14 Western nations range from 2% in Spain to 17% in Australia, with France (9%) positioned midway among these nations. Other estimates of the

Figure 3. 9 Climate change deniers by place of residence



proportion of the population who deny the existence of climate change include 2.2% for British respondents (Spence et al. 2010), 4.0% (Sustainability Victoria 2017), 8% (Leviston et al. 2015), and 13% (Yale Project 2017). Clearly, these estimates differ greatly, suggesting that much depends on the question asked, the cut-off or criterion applied, and the country in which data is collected. What is clear is that strong deniers of climate change represent only a small minority of people in most Western nations.

In terms of gender, men were more likely than women to report as deniers of climate change (3.3% and 1.9%, respectively). In terms of age, relatively few (1.7%) of respondents aged 25-34 years were identified as climate change deniers, and relatively more of those aged 18-24 years (3.0%) and 65 years plus (3.1%) reported as deniers. Interestingly, the proportion of deniers in each education attainment category displayed a “U”-shaped curve, from 5.5% of respondents who had not completed a Baccalaureate, through to 2.4% of those holding a Baccalaureate, 1.5% of those with a Baccalaureate and two further years of study, 1.2% of those with a licence/bachelor’s degree, 3.3 of those holding a master's degree, and four of 64 people (5.9%) of those holding a doctoral qualification. The proportion of deniers was also particularly high among the unemployed (4.0%) and among the small number of respondents with annual household incomes of 200,000 euros or greater (5.8%).

Figure 3.10 Distribution of climate change deniers and non-deniers by income

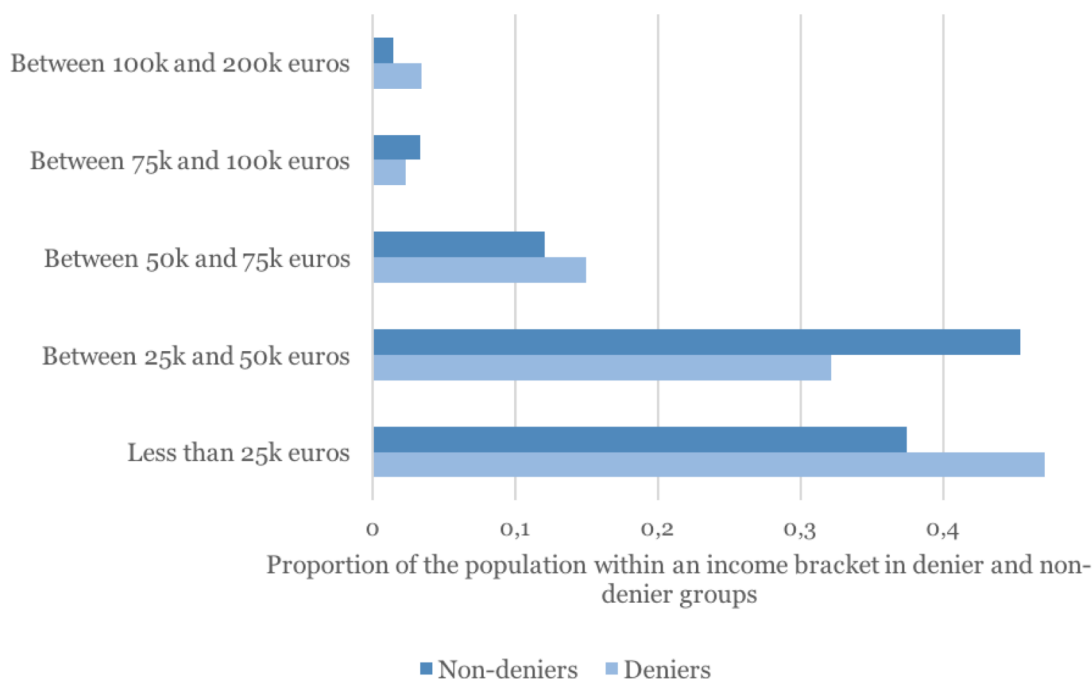


Figure 3.8 shows the relative frequency distribution of climate change deniers and non-deniers as a function of education level. As shown, respondents with less than a high school diploma were twice as likely to be deniers. A higher proportion of climate change deniers amongst those with a lower level of education points to the likelihood that climate change attitudes are strongly influenced by education.

As shown in Figure 3.9, there is a slightly higher share of climate change deniers in urban areas. Figure 3.10 shows that climate change denial is more prevalent among respondents who reported either very low or very high, rather than intermediate, incomes.

Outside of France, denial of climate change has similarly been linked to lower education and to gender. Climate change denial is also over-represented among people with conservative political worldviews, traditional values, and right-wing ideologies. Relationships with age, occupation, and income are generally weaker (Clements, 2012; Climate Institute 2017; Konisky et al. 2016; Leviston et al. 2015; Lujala et al. 2015; Morrison et al. 2013; Poortinga et al. 2011; Sustainability Victoria 2017). For example, Reser (2012a, 2012b) found that acceptance of the reality of climate change increased with education and age, was higher in women than men, in urban rather than rural residents, in respondents intending to vote for left-leaning parties, and among those

who reported having previously had direct experience of the impacts of climate change. Climate change beliefs were unrelated to income.

To best inform policy and effective media campaigns in France, further research is required to investigate the characteristics of local climate change deniers, as well as the kinds of policies and strategies that are likely to influence these disparate groups.

4. Acting on Climate Change

In this section, we first report findings pertaining to three phenomena that underpin a willingness to act on climate change, namely, the processes of psychological adaptation, attribution of the responsibility to act to oneself, and self-efficacy or a belief in one's capacity to act effectively. Subsequent to this, we describe the climate change actions reportedly taken by our survey respondents, and any barriers that limit their taking of such actions.

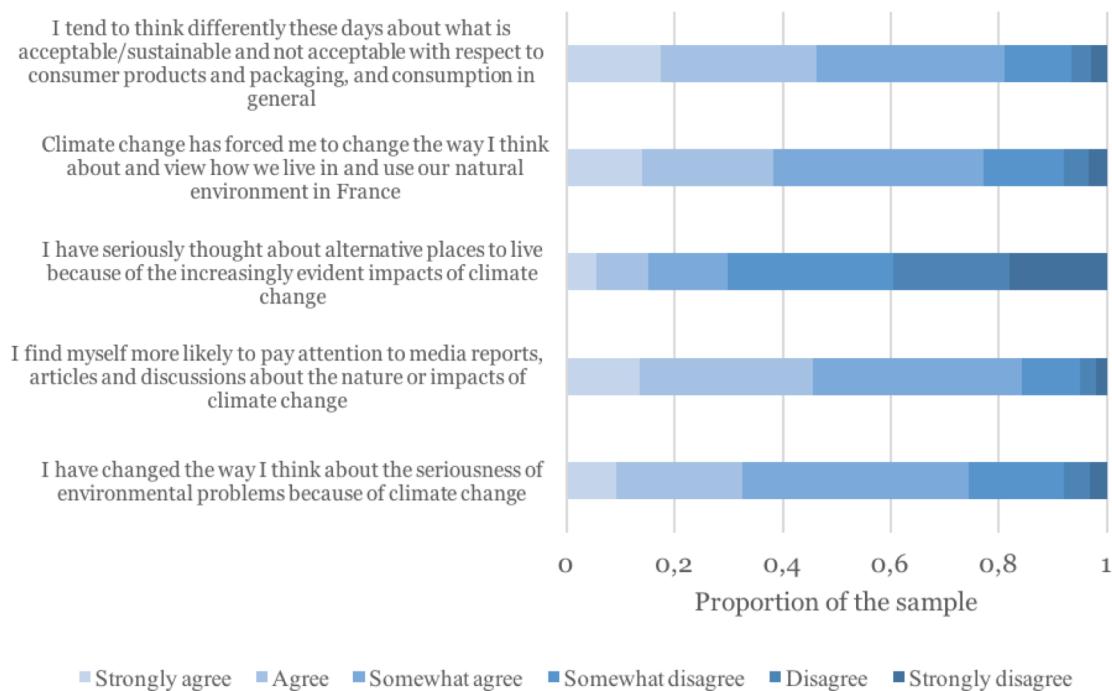
4.1 Psychological adaptation

The questionnaire contained several sets of questions aimed at assessing respondents' propensity or readiness to act on any climate change concerns they have. Critical here is the extent to which individuals are psychologically adapting to climate change. By this we mean the extent which they are confronting the issue and threat of climate change, as opposed to avoiding consideration of it. Psychological adaptation implies becoming more attentive to the issue, coming to terms with its reality and implications, and shifting values and behaviours to a more "pro-environmental" position (see APA Task Force 2009; Moser 2014; Reser et al. 2012).

We measured psychological adaptation by way of five closed-ended items, each of which required a response on a 6-point (*strongly disagree* to *strongly agree*) scale. Items were taken from Reser et al. (2012a, 2012b). An example is "I have changed the way I think about environmental problems because of climate change". See Figure 4.1 for the distribution of responses to these items.

When responses to these items were reverse-scored and then averaged so that high scores indicate a propensity to psychologically confront the issue of climate change, the mean was 2.98. Mean levels of psychological adaptation did not differ between males and females, but did vary with most other demographic variables. For example, psychological adaptation was higher among respondents aged under 35 years (mean = 3.05) than those above this age (mean = 2.95), and higher among students (mean = 3.04) than among the retired (mean = 2.85). It tended to increase with educational attainment (with the exception of the small group of respondents who hold doctoral qualifications), and with income (with the exception of the small group of respondents

Figure 4. 1 Psychological adaptation to climate change



who have an annual household income in excess of 200,000 euros). Finally, a large difference in psychological adaptation was found between those respondents who reported having previously experienced climate change-related extreme weather events (mean = 3.17) and those who reported not having experienced such events (mean = 2.74).

In comparison, a similar set of psychological adaptation questions used in Australian research by Reser et al. (2012a, 2012b) indicated that mean adaptation scores increased with educational attainment and were higher among respondents who reported (versus did not report) having experienced extreme weather and environmental events that they attributed to climate change. In Reser et al.'s research, psychological adaptation did not vary with age or income, but female respondents reported greater adaptation than did their male counterparts.

One indicator of psychological adaptation to climate change is the extent to which people discuss the issue with other people. In our survey, 90.1% of respondents indicated that they at least occasionally discuss their thoughts and feelings about climate change with others. Of those who do discuss climate change, 17.5% indicated that they do so every week, 60.2% do so monthly, and 22.3 % do so only about once a year. Given the opportunity to endorse more than one of the available response

options, when asked with whom they discuss climate change, 83.0% indicated that they discuss it with friends and close family, 18.6% do so with members of the local community, 18.2% do so with same-aged peers, and 10.6% discuss climate change with strangers. These responses suggest quite a high level of engagement with the issue. Discussions of climate change were reported to mainly take place face-to-face (81.6% of respondents endorsed this option), although discussions also occur on social media (19.4%), in online discussion forums (4.9%), at local community group meetings (3.4%), at political rallies (2.8%), and through corresponding with politicians (2.7%).

Although there is limited published research investigating this issue, that which is available suggests that members of the current sample are more active than are other people in discussing climate change. For example, while the majority of our sample discuss climate change frequently with others, a November 2017 Yale Project on Climate Change Communication reported that only 38% of Americans discuss global warming with family and friends often or occasionally, while 62% never do. The numbers are higher in Australia, with Reser et al. (2012a, 2012b) reporting that 54-55% of their samples agreed or strongly agreed that they often discuss their climate change thoughts and feelings with others. However, Leviston et al. (2015) reported that only 2.2% of their Australian respondents indicated that friends and family were a source of their opinions about climate change. Thus, the high prevalence of climate change discussions in the current sample is both noteworthy and important, in part because research suggests that those who engage in such discussions are more likely to take action against climate change (Esham and Garforth 2012; Geiger et al. 2017).

4.2 Attribution of responsibility for climate change action

Another important element in determining people's propensity to act on climate change is the extent to which they attribute the responsibility to act to themselves rather than to other individuals, groups, or institutions. In terms of understanding what may account for the gap between individuals' values and actions, an important factor is the extent to which they view action as part of their social responsibility. Where people view climate change adaptation as the responsibility of the government or industries, or as "someone else's problem", there may be large observable differences between their levels of concern and their tendency to act.

Table 4.1 Responsibility to act on climate change

Parties	Percent of the sample
Industries/companies	30.34
The international community	27.06
National governments	17.39
Individuals and their families	12.75
I don't know	4.43
Environmental groups	3.19
Other parties	2.23
Local governments	1.42
Regional/provincial governments	1.19

As shown in Table 4.1, French citizens view the main locus of responsibility to be spread across private enterprise, the international community and national governments. Only 12.75% of the sample said that individuals and their families are responsible for climate change action. This suggests that while public information campaigns have been successful in making people aware of climate change, as well as informing them about the manner in which they can adopt climate change mitigation practices, what is really lacking is a widely held sense that such action is a shared personal responsibility, and hence all people have a role to play in addressing climate change.

Responses to this question were not uniform across all sub-groups of the sample. In general, responsibility to act on climate change was disproportionately often:

- attributed to industries/companies by females, the less highly educated and the full-time employed,
- attributed to individuals and their families by younger respondents and those with the highest household incomes, and
- attributed to the international community by males, older respondents, the more highly educated, and the retired.

Comparisons can also be made with past studies that have posed similar questions to their respondents (Climate Institute 2017; European Union 2017; Leviston et al. 2015; Reser et al. 2012a; Spence et al. 2010; Sustainability Victoria 2017). For example, the Eurobarometer survey (European Union 2017) found that national governments were most often cited as responsible for tackling climate change. Next most commonly listed were the European Union, and business and industry, with fewer respondents stating

that other parties, including themselves, were responsible. The views of the French participants in this survey were similar to the average responses given by all other respondents, although the French participants more often attributed responsibility to environmental groups than did those from most other nations. In sum, therefore, the largest discrepancy between the findings of the Eurobarometer survey and the current survey was the lower proportion of the current sample that placed responsibility on their national government.

Spence et al. (2010) also found that only a minority (in their case, 9.4%) of their UK sample believed that individuals and their families should be mainly responsible for taking action against climate change. Although not using the same question or response format, Australian respondents generally place a higher responsibility for climate change action on individual citizens (Climate Institute 2017; Leviston et al. 2015; Reser et al. 2012a; Sustainability Victoria 2017). A long-standing tradition in social psychology argues that attribution of environmental responsibility is based on moral norms (Stern et al. 1986).

4.3 Self-efficacy

In addition to at least minimal levels of psychological adaptation and attribution of responsibility for action to one's self, a third factor that can influence propensity to act on climate change is self-efficacy. This term refers to a belief in one's capacity to perform behaviors required to effect change in a given situation (Bandura 1997). This self-belief was measured by way of three climate change-specific items taken from Kellsted et al. (2008) and Reser et al. (2012a, 2012b). A sample item is "I believe that my actions have an influence on climate change." Responses to this sample item were: strongly agree (9.07% of respondents), agree (19.68%), somewhat agree (46.51%), somewhat disagree (18.20%), disagree (4.03%), strongly disagree (2.52%).

Responses to all three self-efficacy items were averaged, with higher scores indicating greater confidence in one's capacity to mitigate the impacts of climate change. The mean score was 3.10 on the 6-point scale. Relatively high levels of self-efficacy were reported by females (mean = 3.17), middle income earners (mean = 3.19), and those who reported having had prior experiences of extreme weather (mean = 3.24), while relatively low levels were reported by respondents aged over 65 years (mean = 2.93),

those who are retired (mean = 2.98), and those who hold a doctoral qualification (mean = 2.85).

In the present sample, just 29% of respondents agreed or strongly agreed with the statement, “my actions have an influence on climate change.” Reser et al. (2012a, 2012b) found that somewhat higher proportions of Australians, 32% (2010) and 38% (2011), agreed or strongly agreed with the same statement. More remarkably, Spence et al (2010) reported that 63% of their UK sample agreed that they could personally help to reduce climate change by changing their behavior. French citizens’ weak perceptions of self-efficacy in the face of climate change also stand in contrast to those reported by Americans, where only 45% of respondents in one study (Leiserowitz 2013) agreed that, “the actions of a single individual won’t make any difference in global warming”.

These findings hold significant implications for understanding French citizens’ responses (or lack thereof) to the threats posed by climate change — a large body of social psychological research (e.g., Bandura 2001; Rudolph et al. 2000; Tannenbaum et al. 2015) demonstrates that perceiving an issue or problem to be a risk is insufficient to generate meaningful ameliorative action. What is needed is both the perception of threat *and* the perception that one has the ability to respond meaningfully to that threat. Thus, the present findings suggest that public engagement efforts around climate change in France must tackle the issue of self-efficacy if the ultimate aim is to encourage positive changes in behavior and/or policy support.

4.4 Taking action against climate change

This section reports our findings in relation to the extent to which climate change (and associated beliefs, concern, knowledge, and so on) is affecting actual behavior and consumption patterns. In order to determine the degree to which the French population is actively taking pro-environmental actions to reduce the effects of climate change, respondents were asked to indicate whether they were taking each of 14 mitigation actions to reduce their carbon footprint. As shown in Table 4.2, the most common forms of action were the use of fluorescent light bulbs (performed by 88% of respondents), turning off electronics not in use (78%), and using re-useable shopping bags (77%).

Table 4.2 Adopting climate change mitigation actions

Mitigation practice	Percent of respondents
Use compact florescent light bulbs	88.30
Turn off electronics when they're not being used	77.90
Use re-usable shopping bags instead of paper or plastic bags	77.47
Recycle	73.19
Try to use as little water as possible, for example, when you shower	68.99
Try to reuse things you already have instead of buying new things	57.30
Try to reduce the amount of trash you create	53.65
Buy local food/organic food or grow your own food	47.56
Reduce your consumption of plastic	46.38
Try to reduce your travel	38.56
Make an effort to reduce the amount of beef you eat	36.44
Carry your own re-usable beverage container	35.72
Wash laundry in cold water (instead of hot water)	23.56
Buy carbon offsets	1.55
Other	3.91
None	0.66

These percentages can be compared with those obtained in similar surveys (e.g., Climate Institute 2017; European Union 2017; Leviston et al. 2015; Reser et al. 2012a, 2012b; Sustainability Victoria 2017). For example, in the 2017 Eurobarometer survey of climate change (European Union 2017), 83% of French respondents reported trying to reduce waste and recycle, 60% tried to reduce their use of disposable items, and 53% purchased locally produced and seasonal foods whenever possible. While the wording and substance of the items in the two surveys vary slightly, the proportions of the two samples engaging in each of these mitigation actions is broadly similar.

When comparing the current findings with Australian research by Reser and colleagues, it is clear that some behaviors are practiced at similar rates in both countries (e.g., compared to the 88% of French respondents who use compact fluorescent light bulbs, 83% (2010) and 90% (2011) of Australians report doing so). However, there are also some striking differences: compared to the 73% of French respondents who recycle, 88% (2010) and 86% (2011) of Australians claimed to do so, and compared to the 1.5% of French respondents who buy carbon offsets, 6% (2010) and 21% (2011) of Australians reported doing so. Presumably, these differences reflect a range of factors including differences in cultural norms, pricing, and structural

opportunities and constraints.

Using a count of the number of mitigation actions taken (see Babutsidze and Chai 2018), the possible number of actions across the population ranged from 0 to 14. The mean number of actions taken in this sample was 7.30, with a standard deviation of 3.0. About 0.7% of the respondents do not take any of the 14 actions to mitigate climate change. In the recent Eurobarometer survey (European Union 2017), which used a somewhat different list of 14 mitigation actions, 4% of French respondents claimed to engage in none of the items listed. On average, in the current sample, females (mean = 7.85) reported engaging in slightly more of these behaviors than did males (mean = 6.69), respondents aged over 45 years reported more behaviors (mean = 7.93) than did younger respondents (mean = 6.75), retired people (mean = 7.91) and the unemployed (mean = 7.64) performed more behaviors than did students (mean = 6.37), and respondents who had prior experiences of extreme weather events (mean = 7.60) performed more behaviors than did those without such experiences (mean = 6.94). Performance of these mitigation behaviors did not vary greatly with education or income.

Between-nation comparisons can be made in the demographic and other correlates of participation in pro-environmental behaviors (Capstick et al. 2014; Gifford and Nilsson 2014; Reser et al. 2012a, 2012b). For example, Reser et al. (2012a, 2012b) found that the extent to which their Australian respondents reported engaging in pro-environmental behaviors increased with education, was higher in women than men, higher in the retired and unemployed (compared to the full-time employed and students), and higher among respondents intending to vote for left-leaning parties and those who reported having previously had direct experience of the impacts of climate change. Behavior was unrelated to employment status and place of residence. In 2011 (but not in 2010), pro-environmental behaviors decreased with income. In sum, pro-environmental behaviors were associated in the same ways with many demographic variables in both France and Australia.

It is worth noting, that not every greenhouse gas mitigation practice has a similar effect in terms of the potential contribution to mitigating effects of climate change (Steg et al. 2018). In-depth study of green consumer behavior should concentrate on actions with higher potential impact (Stern and Wolske 2017; Wolske and Stern 2018).

On average, French respondents were willing to pay 9.6% more for a product (in the

surveyed example, a refrigerator), which was 50% more energy efficient, with 19% of respondents willing to pay 20% more, and 5% willing to pay 50% more. Similar findings have been reported elsewhere (e.g., Leviston et al. 2011; Reser et al. 2012a, 2012b; Spence et al. 2010). These results suggest French people are likely to purchase more than just fluorescent light bulbs to reduce carbon emissions. Purchase decisions that are made once, such as these, as opposed to consumption decisions that need to be made repeatedly and consistently (e.g., using as little water as possible), have been found to be more effective strategies for reducing household carbon emissions (Dietz et al. 2003). The general willingness for the French population to pay more for energy efficient products may, therefore, provide a valuable focus for policy reviews.

4.5 The value-action gap

In terms of reducing GHGs, there is a growing recognition among policy-makers that policies need to move beyond tax schemes and subsidy programs that typically take a long time to implement and solely rely on pecuniary incentives. There has been an ongoing effort to foster the voluntary adoption of ‘green’ consumption patterns via social marketing campaigns and other ‘soft’ tools such as education and labeling (Dietz et al. 2009). However, the effectiveness of such schemes has been very mixed: Research shows that such efforts often fail because current consumption patterns tend to be ‘locked in’ for a range of reasons, including social and cultural influences (Myers and Kent 2003), status races (Frank 2001), and consumption settings that resemble “tragedy of the commons” scenarios (Wagner 2006). Yet there are also several other instances where green preference households have emerged on their own accord (Pederson 2000).

Recently, a growing social movement has suggested that the key to promoting environmental awareness among households is by improving the work-life balance. Voluntary Simplifiers, otherwise known as ‘downshifter’, seek to achieve a better work-life balance and sustainable lifestyle (McDonald et al. 2006). A US survey indicated that 19 percent of adult Americans had voluntarily decided to reduce their incomes and consumption levels. In Australia, 23 percent of adults aged 30-59 have reported that they have altered their working career in order to achieve a better lifestyle (Hamilton and Mail 2003). To what extent can an improvement in household work-life balance help achieve more sustainable consumption patterns?

Table 4.3 Relationship between climate change concern and mitigation actions

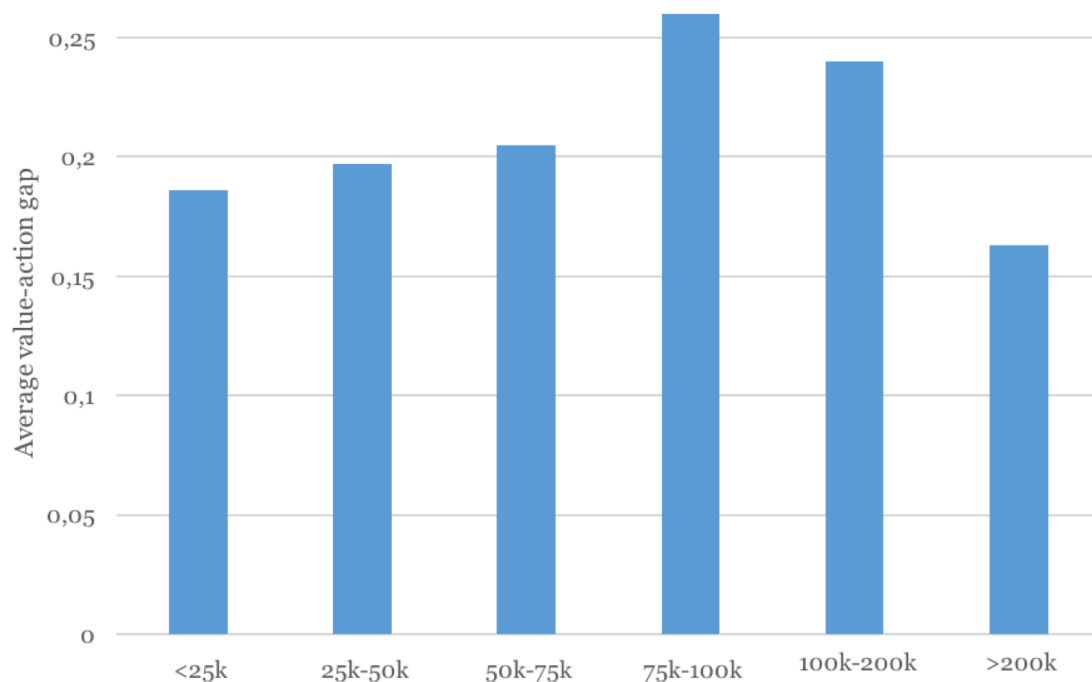
Level of concern	Percent of the sample	Mean number mitigation actions (range 0-14)
Very concerned	22.42	8.67
Fairly concerned	61.30	7.30
Not very concerned	13.86	5.53
Not concerned at all	1.39	4.28
No opinion	1.02	5.72

In this regard, a useful way to study the behavioral barriers to climate change adaptation is the value-action gap (Chai et al. 2015; Gifford 2011). This is the observed difference between people's concern about climate change and their propensity to *act* on this concern by adopting climate change mitigation practices. In the current study, the level of climate change concern was positively related to the number of mitigation actions reported ($r=0.33$, $p<0.01$). This positive relationship is shown in Table 4.3, where it can be seen that engaging in mitigation behaviors tended to increase with levels of concern. However, even those respondents who reported the highest levels of concern participated in an average of only 8.67 (62%) of the possible mitigation actions listed. Thus, a value-action gap is evident. Recent research has sought to identify reasons for the existence of this gap. Chai et al. (2015), for example, found that economic factors relating to discretionary time were related to a discrepancy between the value individuals place on climate change and their actions to mitigate its effect.

The value-action gap was calculated by rescaling individual levels of concern and mitigation actions so that each ranged from 0 and 1. Individuals' transformed score for actions taken was subtracted from their concern (value) number to provide a value-action gap metric. The resulting variable ranged from -1 to +1, with positive numbers indicating greater concern than mitigation actions taken, and negative numbers indicating more actions than concern.

The average level of the value-action gap in the French sample was 0.2, with the highest gap occurring in those earning between €75,000 and €100,000 (mean gap = 2.6). This is compared to those earning under €50,000 (1.93), and over €200,000 (1.67).

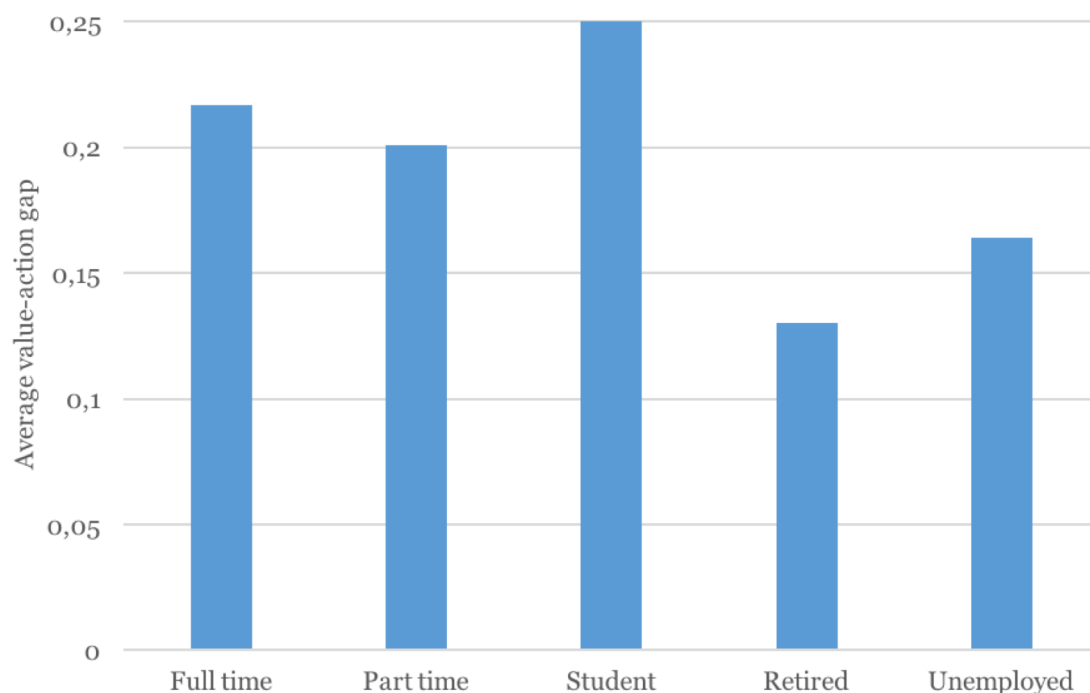
Figure 4. 2 Average value-action gap by income



Counterintuitively, but similar to that which has been found in an Australian sample (Chai et al. 2015; Reser et al. 2012a), the value-action gap was higher in those who had noticed environmental changes that they attribute to climate change (0.22, $p < 0.01$) than in those who had not (0.17, $p < 0.01$). This highlights how changed perceptions of climate change may lead to heightened concern, but not necessarily to greater action. In addition, those reporting that they are certain of the reality of climate change were more likely to have a higher value-action gap ($r = 0.23$, $p < 0.01$).

French students demonstrated the highest value-action gap, as well as the lowest level of mitigation behaviors (6.37/14), while retired respondents had the lowest value-action gap, and the highest level of mitigation behaviors (7.91/14). This suggests a likely interaction between free time and resources contributing to an individual's ability to act on their values to reduce the effects of climate change, with students more likely to lack both time and resources, and retirees more likely to have time and at least marginal resources sufficient to act on their values (Chai et al. 2015).

Figure 4. 3 Average value-action gap by employment status



4.6 Barriers to action

To explore possible reasons for the existence and size of the value-action gap, survey respondents were asked to indicate whether each of nine factors acted as barriers to them taking more action to address climate change. Multiple responses were permitted from each respondent. The percentage of respondents endorsing each option is given in Table 4.4. As shown, a lack of awareness of what to do, a lack of money to do what is required, and a lack of self-efficacy to solve the problem emerged as the most commonly reported barriers to action (c.f. Gifford 2011). Each of these has profound policy implications: It seems that our respondents may display more climate change action if given greater access to knowledge, money, and self-belief.

Different sub-groups of the sample tended to endorse different barriers to climate change action. For example, compared to older respondents, 18-25-year-olds were more likely to cite several barriers (e.g., financial factors, time constraints, a lack of interest/awareness/motivation), but their views on other potential barriers (e.g., knowledge of what to do, efficacy beliefs) were similar to those of the remainder of the sample. Male respondents were more like to endorse nearly all barriers more strongly

Table 4.4 Perceived barriers to taking climate change mitigation actions

What are the reasons that preclude you from taking more actions to address climate change?	Percent of the sample answering "Somewhat agree", "Agree" or "Strongly Agree"
Don't know what to do	67
Too expensive in terms of money	62
Too big a problem for individual action to have impact	54
Lack of interest/awareness/motivation	43
Too expensive in terms of time investment	42
Don't think it'll do any good	35
Too inconvenient/too much effort	27
Don't think it's necessary	24
Don't believe climate change is happening	18

than did females, with the exception that both genders viewed financial expenses as equally important. Similarly, when the sample was broken up by educational attainment, the groups did not differ in relation to some potential barriers (e.g., inconvenience, time commitment required), but less highly educated respondents were more likely cite not knowing what actions to take as a barrier, while highly educated respondents more strongly supported a lack of interest/awareness/motivation and a disbelief in the reality of climate change as barriers to action. Students reported financial factors as a barrier, but, interestingly, respondents who were employed full-time did not report lack of time as a major barrier. Not surprisingly, financial factors produced the biggest difference in ratings when the sample was divided into groups based on income; low-income respondents more strongly endorsed the “too expensive” option as a barrier to action.

5. Regional Differences in Climate Change Perceptions

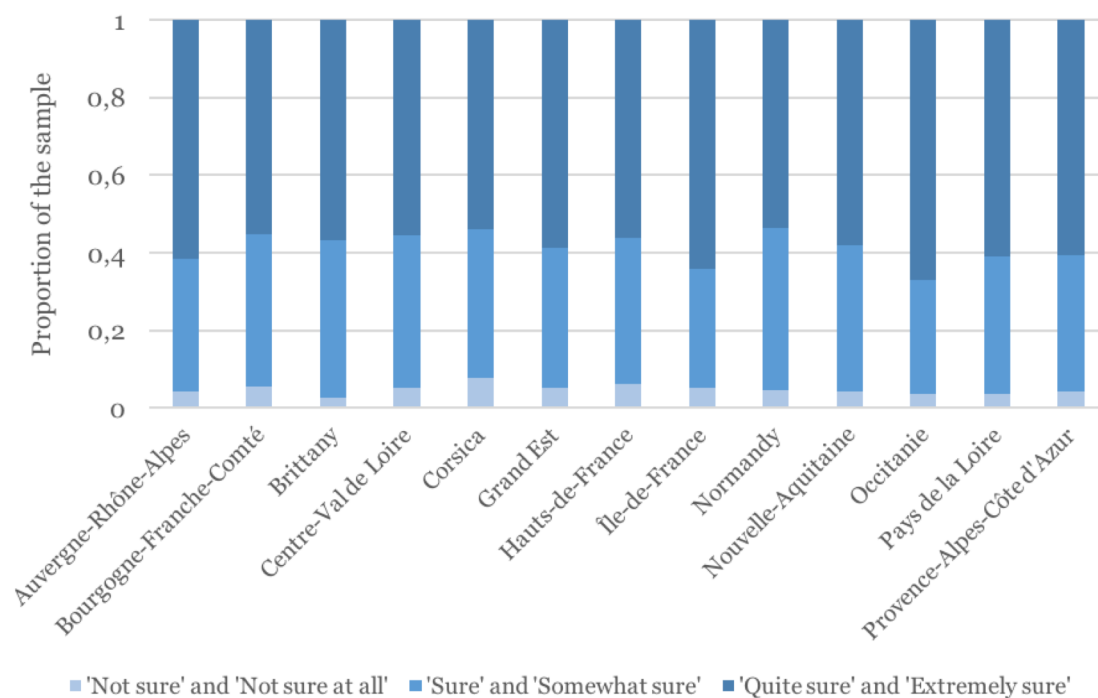
In this section we look at how 13 regions of Metropolitan France differ from one another on various climate change-related variables. Particular attention is paid to the Provence-Alpes-Côte d'Azur (PACA) region. A map illustrating positioning of 13 French provinces is presented in Figure 5.1. Naturally, regions vary in terms of the land area, as well as population.³

Figure 5.1 French provinces



³ The areas are visualized on the map, while the population data is presented in Table 2.2.

Figure 5. 2 Certainty about climate change across French regions



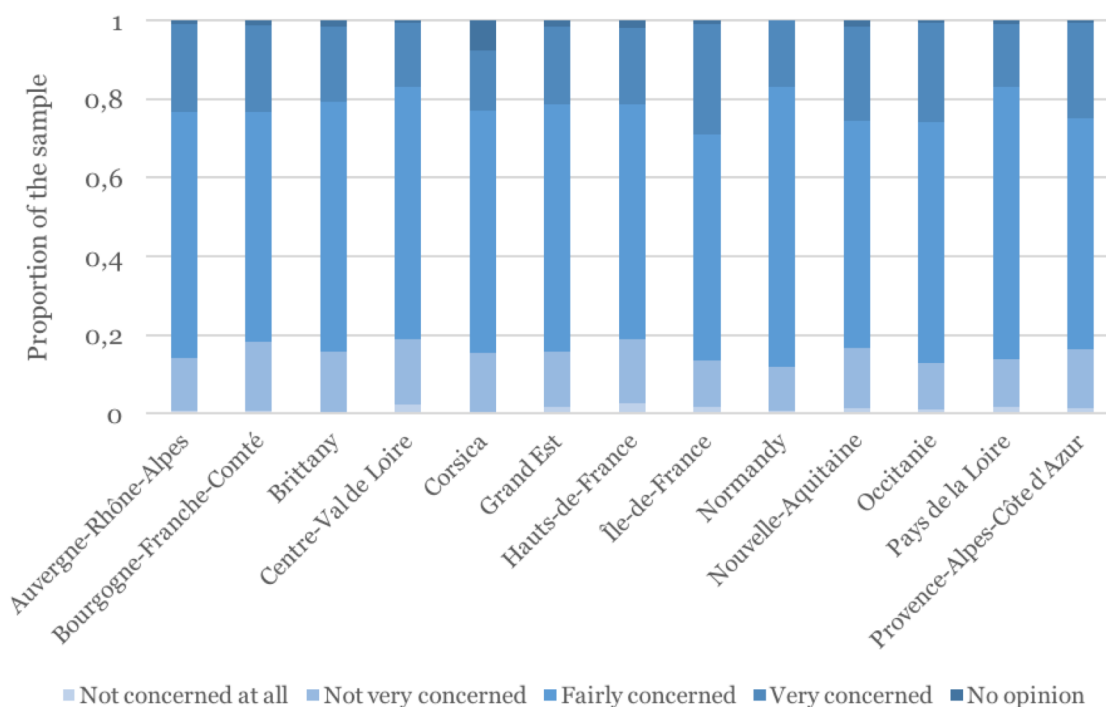
5.1 Belief and concern about climate change

As pointed out in section 3, the majority of the French population believe that climate change is real. On aggregate, only 4.7% of the French population is either “Not sure” or “Not sure at all” about the certainty of climate change.

The regional distribution of the share of respondents answering either “Not sure” or “Not sure at all” to the survey question are colored in blue in Figure 5.2. Overall, responses to this question are quite uniform across the 13 regions, with percentages ranging between 2.7% in Bretagne and 7.6% in Corsica. However, notice the low number of respondents from Corsica. The share of such respondents in the PACA region is 4.1%, just under the national average. Overall, the population of each French region seems to be very certain about the reality of climate change.

To what extent does concern about climate change vary across regions? Figure 5.3 presents the regional distribution of concern about climate change. The regional variance in this case seems to be significant. The share of the regional population who responded either “Not concerned at all” or “Not very concerned” to the appropriate question varies between 11.8% in Normandie and 19% in Hauts-de-France. This

Figure 5.3 Regional levels of concern about climate change



suggests that levels of concern are elevated in the South as well as in metropolitan Paris. It is likely that this is related to the South having higher levels of exposure to extreme weather events and Paris having a higher level of education⁴. The average share of respondents who were not very concerned with the climate change is 15.5%. PACA respondents were one percentage point higher than the national average at 16.5%.

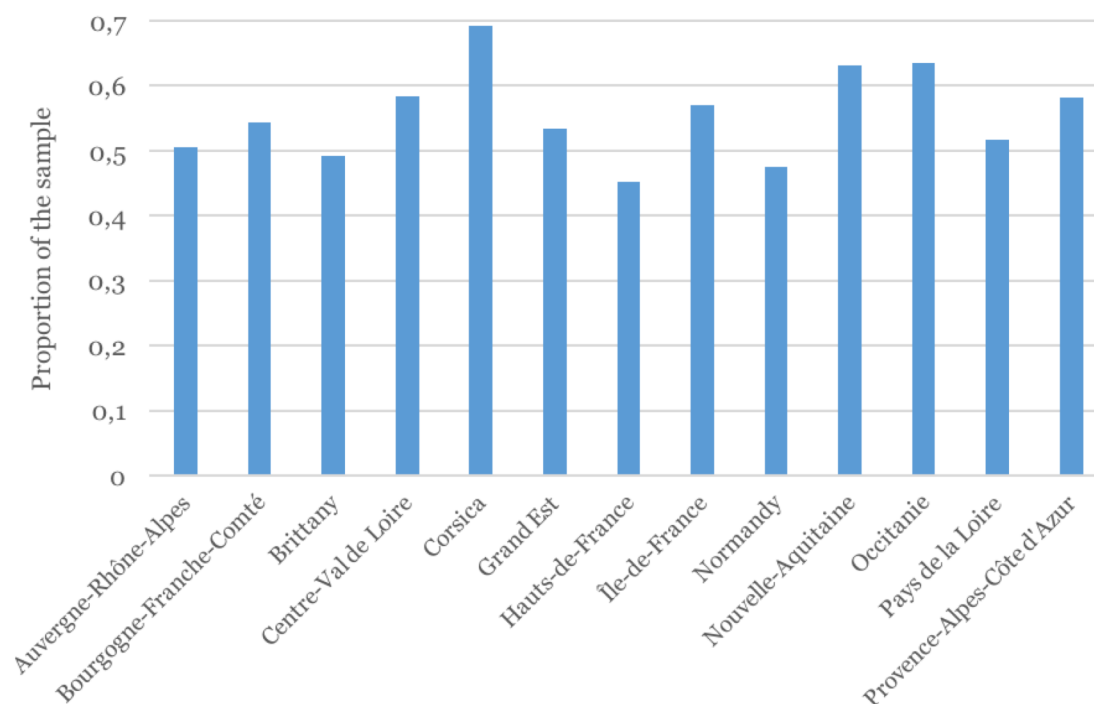
Notwithstanding this regional variation, it is important to note that, similar to the certainty about climate change, an overwhelming share of the population in every region is concerned by the climate change. There is also some evidence in our data that populations in regions with higher levels of certainty about climate change also exhibit higher levels of concern with this phenomenon (the cross-regional correlation is 0.66).

5.2 Climate experiences, exposure and vulnerability

In section 3 we have reported that on the national level 55% of our sample population reports having had a direct experience with the extreme weather events. Given the

⁴ <http://www.georisques.gouv.fr>; <https://www.insee.fr>.

Figure 5. 4 Share of individuals who have experienced extreme weather events across French regions



diversity of French terrain across regions, it is interesting to take a look at whether this number varies significantly between French regions. Figure 5.4 presents the regional shares of the sample who have experienced at least one extreme weather event. This share varies significantly between 45% in Hauts-de-France to 69% in Corsica. The data quality caveat applies to the Corsican case in this instance too, but the second highest share is reported by residents of Occitanie (63%).

Interestingly, recall that Hauts-de-France was the region with the highest share of the population that was not concerned by climate change. These findings indicate a possible link between extreme weather experience and concern with climate change in France. Our data indicate that 58% of Provence-Alpes-Côte d'Azur residents have had a direct experience with extreme weather events. Besides Corsica and Occitanie, Nouvelle-Aquitaine is the only other French region with a higher share of the population that has been affected by such events compared to PACA.

Given such discrepancies across the regions, it is interesting to see how residents of different regions evaluate natural conditions in their regions, and what they think about their vulnerabilities to natural disasters as well as to climate change.

Table 5.1 Evaluation of natural conditions and vulnerability across French regions

	Auvergne-Rhône-Alpes	Bourgogne-Franche-Comté	Brittany	Centre-Val de Loire	Corsica	Grand Est	Hauts-de-France	Ile-de-France	Normandy	Nouvelle-Aquitaine	Occitanie	Pays de la Loire	Provence-Alpes-Côte d'Azur	France	France without PACA	F-test	T-test
How would you rate the condition of the natural environment in your region?	3.66	3.78	3.85	3.73	3.54	3.73	3.43	3.04	3.62	3.77	3.64	3.70	3.40	3.52	3.54	25.27 (0.00)	2.88 (0.00)
How vulnerable do you think your region is to natural disasters?	3.11	2.91	3.11	3.28	4.23	2.91	2.77	2.84	2.92	3.43	3.78	2.86	4.35	3.22	3.07	62.35 (0.00)	-21.70 (0.00)
How vulnerable do you think the region where you live is to the impacts of climate change?	3.44	3.20	3.43	3.31	4.15	3.30	3.24	3.41	3.25	3.61	3.79	3.20	4.06	3.49	3.41	20.19 (0.00)	-12.13 (0.00)

Note: Questions were asked on 6-point scale. In case of the first question 1 corresponds to very poor, while 6 corresponds to excellent. In case of the latter two questions: 1 corresponds to not vulnerable, while 6 corresponds to very vulnerable. F-test provides a test checking whether there is a statistically significant difference across all 13 regions simultaneously. T-test provides a check whether respondents in PACA are statistically different from respondents in the rest of France. Values in brackets are p-values of corresponding tests.

This data is presented in Table 5.1. Each of the questions in this block asked respondents to answer on a six-point scale. For the question about the ranking of the natural conditions, an answer of 1 corresponds to “Very poor”, while an answer of 6 corresponds to “Excellent”. For the latter two questions, an answer of 1 corresponds to “Not vulnerable”, while 6 corresponds to “Very vulnerable”. The numbers presented are the averages of the six-point scale answers within each region. We also report the average answer across France, as well as the average number across all France without PACA. The latter is important as we wish to evaluate whether the residents of Provence-Alpes-Côte d’Azur region are significantly different from the rest of the French population.

The last two columns in the table report two statistical tests. The F-test evaluates whether the difference that we see across all 13 regions with respect to each of the characteristics is statistically significant. The t-test evaluates whether the difference between PACA and France without PACA is statistically significant.

As can be read from the table, the differences across French regions are statistically significant in all three instances. In other words, responses differ systematically as a function of respondents’ region of residence. Île-de-France residents evaluate their natural environment the worst out of all French residents, however they do not think that the region is vulnerable to natural disasters or to climate change. The residents of Bretagne give the highest evaluation to the natural environment of their region.

PACA residents give an average score of 3.4 to the natural environment, which is significantly lower than the average of 3.54 given to the entirety of the other 12 French regions. In terms of vulnerability to both natural disasters and climate change (i.e., the likelihood of increasing frequency of natural disasters), PACA (together with Corsica) ranks at the top of the chart. In both cases, PACA residents’ evaluation of the vulnerability of the region is statistically higher than that of the respective evaluations of residents of the other regions.

Another aspect worthy of closer consideration is the concern with different types of pollution. Table 5.2 gives the regional perspective on air, water, soil, noise and light pollution concerns. The structure of the table is similar to that of Table 5.1, thus it allows us to evaluate the statistical significance of the cross-regional variance.

Table 5.2 Concern with different types of pollution across French regions

	Auvergne-Rhône-Alpes	Bourgogne-Franche-Comté	Brittany	Centre-Val de Loire	Corsica	Grand Est	Hauts-de-France	Ile-de-France	Normandy	Nouvelle-Aquitaine	Occitanie	Pays de la Loire	Provence-Alpes-Côte d'Azur	France	France without PACA	F-test	T-test
Air pollution	4.61	4.23	4.34	4.29	4.00	4.61	4.62	5.07	4.63	4.17	4.46	4.27	4.76	4.60	4.58	13.51 (0.00)	-2.60 (0.01)
Water pollution	4.27	4.10	4.55	4.09	3.85	4.41	4.34	4.45	4.46	4.23	4.53	4.29	4.63	4.39	4.36	3.51 (0.00)	-3.74 (0.00)
Soil pollution	4.19	4.07	4.33	4.06	4.00	4.27	4.13	4.30	4.31	4.11	4.47	4.14	4.36	4.25	4.24	2.01 (0.00)	-1.73 (0.01)
Noise pollution	3.82	3.71	3.53	3.60	3.31	3.89	3.98	4.60	3.89	3.58	3.96	3.73	4.22	3.99	3.96	14.88 (0.00)	-3.18 (0.00)
Light pollution	3.52	3.37	3.27	3.30	2.62	3.40	3.52	4.01	3.57	3.33	3.65	3.46	3.62	3.57	3.57	7.20 (0.00)	-0.58 (0.56)

Note: All questions were asked on 6-point scale. 1 corresponds to "Not concerned at all", while 6 corresponds to "Very Concerned". F-test provides a test checking whether there is a statistically significant difference across all 13 regions simultaneously. T-test provides a check whether respondents in PACA are statistically different from respondents in the rest of France. Values in brackets are p-values of corresponding tests.

As can readily be seen, concerns regarding pollution vary significantly across the 13 French regions. However, there is a general consensus in terms of the importance of different types of pollution. In all regions people are more concerned with air, than with water pollution. These are followed by concerns with soil, noise and light pollution. The exception is Île-de-France where noise pollution seems to be of more concern than water and soil pollution.

PACA residents are more concerned by all five types of pollution than the rest of France on average. This discrepancy is significant in all cases except light pollution. In the latter case, Provence-Alpes-Côte d’Azur residents are not statistically different from their compatriots from other regions.

5.3 Attribution of responsibility about climate change

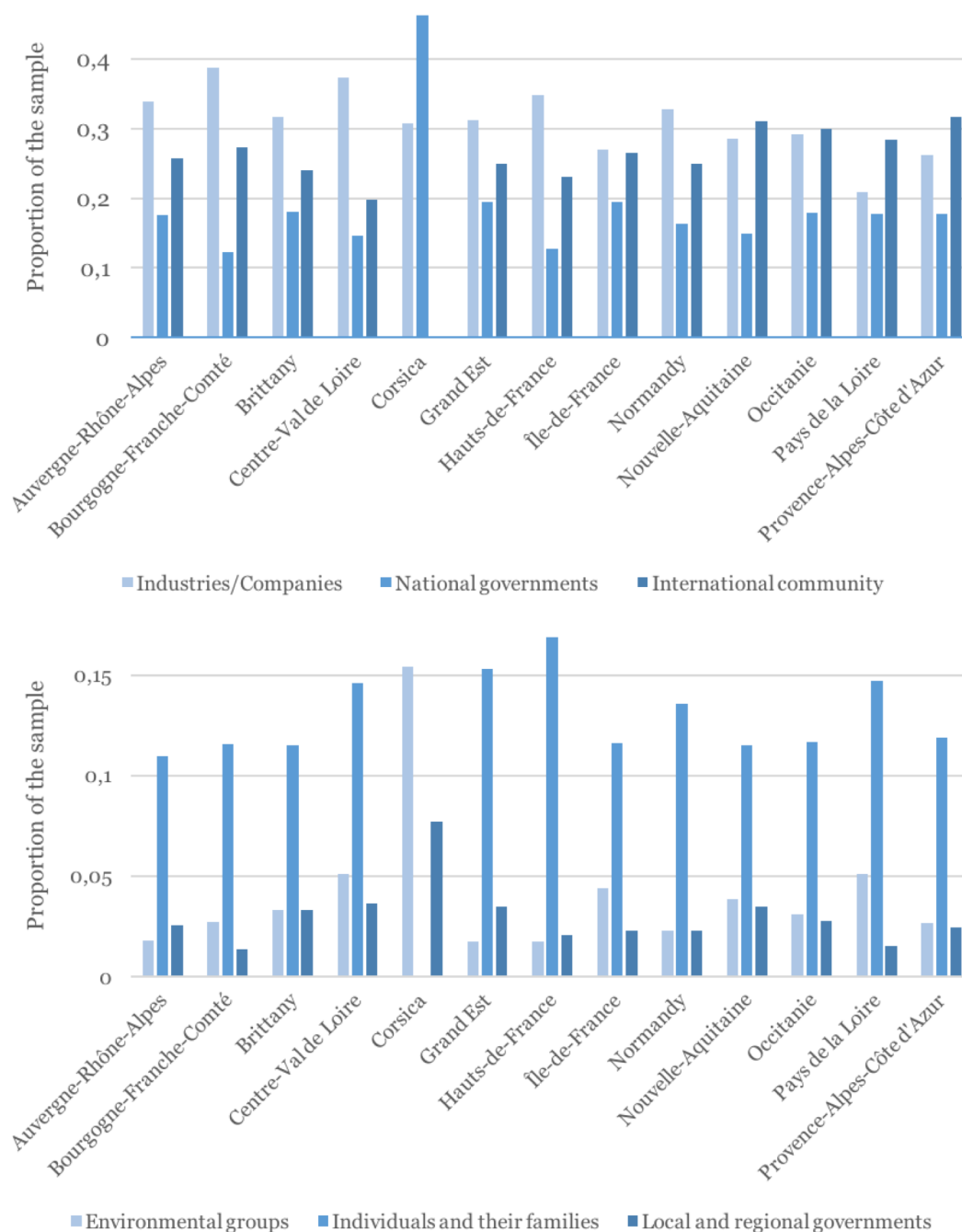
How do attributions of responsibility to act on climate change vary across French regions? Figure 5.5 presents the regional decomposition of the data presented in Table 3.1. The height of the bars corresponds to the share of respondents from a particular region attributing the most responsibility of action to various stakeholders.

There are some commonalities across regions (for example, a relatively low share of the population in each region expect local and regional authorities and environmental groups to act). On the other hand, there are some interesting discrepancies too. Bypassing the case of Corsica due to data quality concerns, the remaining 12 regions can be split into two groups. In the first, more populous group, residents have highest expectations for action from industries/companies. In the second group, to which Provence-Alpes-Côte d’Azur belongs, the highest expectations are put on the international community.

5.4 Action against climate change and barriers to action

Despite the attribution of responsibility to act to other stakeholders, French residents also take actions themselves to mitigate the effects of climate change. It is interesting how these actions vary across regions. Respondents were presented with 14 common mitigation practices and asked to point which of them they were currently engaged in. This data on a national level has been presented in Table 4.2. Table 5.3 presents a

Figure 5.5 Attribution of the responsibility to act by residents across French regions



regional decomposition. The numbers correspond to the share of respondents within each French region who are taking each particular action. There are clear commonalities across regions, as well as differences.

Table 5-3 Engagement with each of 14 climate change mitigation actions across French regions

	Auvergne-Rhône-Alpes	Bourgogne-Franche-Comté	Brittany	Centre-Val de Loire	Corsica	Grand Est	Hauts-de-France	Ile-de-France	Normandy	Nouvelle-Aquitaine	Occitanie	Pays de la Loire	Provence-Alpes-Côte d'Azur
Turn off electronics when they're not being used	0.79	0.78	0.79	0.80	0.62	0.83	0.76	0.75	0.80	0.79	0.81	0.78	0.74
Use compact florescent light bulbs	0.86	0.88	0.92	0.85	0.85	0.90	0.91	0.86	0.90	0.87	0.91	0.89	0.90
Try to use as little water as possible	0.71	0.67	0.75	0.73	0.62	0.72	0.67	0.68	0.67	0.69	0.68	0.66	0.68
Reuse things you already have instead of buying new things	0.59	0.55	0.60	0.52	0.23	0.59	0.52	0.56	0.60	0.61	0.60	0.56	0.58
Use re-usable shopping bags instead of paper or plastic bags	0.80	0.79	0.81	0.77	0.54	0.81	0.77	0.72	0.79	0.78	0.76	0.75	0.81
Reduce your consumption of plastic	0.47	0.48	0.49	0.47	0.38	0.48	0.43	0.41	0.47	0.48	0.50	0.44	0.50
Carry your own re-usable beverage container	0.41	0.32	0.37	0.39	0.08	0.31	0.25	0.35	0.31	0.38	0.36	0.38	0.42
Wash laundry in cold water (instead of hot water)	0.25	0.21	0.21	0.17	0.08	0.27	0.20	0.26	0.25	0.20	0.26	0.19	0.25
Try to reduce the amount of trash you create	0.54	0.57	0.57	0.58	0.46	0.62	0.50	0.47	0.59	0.54	0.57	0.55	0.51
Make an effort to reduce the amount of beef you eat	0.40	0.29	0.36	0.31	0.08	0.30	0.36	0.38	0.29	0.40	0.40	0.36	0.40
Recycle	0.79	0.79	0.85	0.74	0.54	0.79	0.74	0.67	0.77	0.71	0.73	0.69	0.69
Buy carbon offsets	0.02	0.01	0.00	0.02	0.00	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.02
Buy local/organic food or grow your own food	0.53	0.48	0.61	0.45	0.31	0.44	0.45	0.35	0.44	0.55	0.60	0.46	0.50
Try to reduce your travel	0.39	0.39	0.45	0.39	0.15	0.45	0.40	0.33	0.38	0.36	0.38	0.38	0.41
Other	0.05	0.02	0.05	0.06	0.00	0.04	0.03	0.04	0.03	0.03	0.03	0.05	0.04
None	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00

Note: Numbers correspond to the share of population in each region who have reported taking each particular action. Numbers on aggregate French level are reported in Table 4-2.

Residents of PACA seem to be leading the national effort in a number of climate change effect mitigation practices. Provence-Alpes-Côte d'Azur residents report the highest engagement with the usage of reusable shopping bags, carrying their own reusable beverage containers, and making efforts to reduce the use of plastic and consumption of beef.

An alternative way to look at this data is to consider at the number of mitigation practices taken by individuals in each of the regions (following Babutsidze and Chai 2018). These numbers are given in the first row of Table 5.4. These numbers show that, on average, respondents reported taking 7.3 actions out of the 14 actions that they have been questioned about. The variance across regions is statistically significant, however PACA does not seem to be statistically different from the rest of France.

Another variable presented in Table 5.4 is the value-action gap that has been discussed in section 4.5. Here too, there seem to be significant discrepancies across regions, however, Provence-Alpes-Côte d'Azur residents do not seem to be any different from the average of the rest of France.

Next, we concentrate on the analysis of barriers to green actions. This builds on the part of the questionnaire where we asked respondents to identify circumstances that prevent them from taking more action to counter the negative effects of the climate change. Nine circumstances were identified and offered as possible answers. Table 5.5 presents the regional decomposition of responses in terms of a share of each region's population choosing a particular circumstance as one of the reasons for not taking more green actions. As demonstrated by the F-test, differences across regions are not significant for six out of the nine response options. The only three answers generating statistically significant differences are: inconvenience, time cost, and belief in the necessity of such actions.

In reverse order, over 30% of Bourgogne-Franche-Comté and Normandy residents do not think it is necessary to take further actions, while only 15% of Corsicans fall under this category. In general, there seems to be a North-South separation on this topic, which points to the fact that informational and educational activities in Northern regions of France might be particularly efficient for encouraging more people to take green actions.

Table 5-4 Engagement with mitigation actions and distribution of the value-action gap across French regions

	Auvergne-Rhône-Alpes	Bourgogne-Franche-Comté	Brittany	Centre-Val de Loire	Corsica	Grand Est	Hauts-de-France	Île-de-France	Normandy	Nouvelle-Aquitaine	Occitanie	Pays de la Loire	Provence-Alpes-Côte d'Azur	France	France without PACA	F-test	T-test
Average number of mitigation actions taken	7.60	7.24	7.81	7.23	4.92	7.58	6.99	6.85	7.32	7.41	7.61	7.17	7.46	7.30	7.28	3.53 (0.00)	-1.12 (0.26)
Value-action gap (average)	0.19	0.19	0.15	0.17	0.32	0.17	0.19	0.25	0.19	0.19	0.20	0.19	0.19	0.20	0.20	4.37 (0.00)	0.81 (0.42)

Note: Numbers are calculated based on questions about 14 mitigation actions as described in Table 3.2. Methodology for calculating value-action gap is detailed in section 3.8. F-test provides a test checking whether there is a statistically significant difference across all 13 regions simultaneously. T-test provides a check whether respondents in PACA are statistically different from respondents in the rest of France. Values in brackets are p-values of corresponding tests.

With respect to time costs, over half of Centre-Val de Loire residents think that climate change mitigation actions are too expensive in terms of time required, while only 36% of Bretagne residents agree with them. Provence-Alpes-Côte d'Azur residents stand at 40%, just under the national average (42%). Île-de-France residents are bothered by the inconvenience of such actions (33%), while residents of Bretagne once again find themselves at the lower end of the spectrum (18% of respondents identifying inconvenience as a barrier to taking more actions).

T-test results reveal that Provence-Alpes-Côte d'Azur residents are not significantly different from the residents of other parts of the country in eight out of nine instances. The only circumstance with a statistically significant difference is monetary cost of green actions. While 62% of the population of the rest of France thinks this is one of the barriers to action, only 57% of PACA residents agree. This result again points to relatively small, but potentially important, regional differences in the perceived barriers to acting on climate change.

Table 5.5 Barriers to green actions across French regions

	Auvergne-Rhône-Alpes	Bourgogne-Franche-Comté	Brittany	Centre-Val de Loire	Corsica	Grand Est	Hauts-de-France	Ile-de-France	Normandy	Nouvelle-Aquitaine	Occitanie	Pays de la Loire	Provence-Alpes-Côte d'Azur	France	France without PACA	F-test	T-test
Lack of interest/awareness/ motivation	0.45	0.49	0.36	0.50	0.54	0.42	0.41	0.44	0.40	0.44	0.39	0.45	0.46	0.43	0.43	1.15 (0.31)	-0.92 (0.35)
Don't think it's necessary	0.21	0.31	0.20	0.27	0.15	0.24	0.31	0.24	0.31	0.24	0.20	0.24	0.23	0.24	0.25	1.81 (0.04)	0.89 (0.37)
Too expensive in terms of money	0.61	0.62	0.63	0.69	0.77	0.60	0.64	0.61	0.63	0.61	0.63	0.68	0.57	0.62	0.62	1.09 (0.37)	2.01 (0.04)
Too expensive in terms of time investment	0.43	0.37	0.36	0.53	0.54	0.40	0.39	0.45	0.46	0.37	0.44	0.45	0.40	0.42	0.42	2.00 (0.02)	0.75 (0.45)
Don't believe climate change is happening	0.17	0.24	0.15	0.24	0.15	0.17	0.23	0.17	0.15	0.18	0.19	0.18	0.18	0.18	0.18	1.26 (0.23)	0.17 (0.87)
Too inconvenient/too much effort	0.28	0.26	0.18	0.31	0.23	0.24	0.28	0.33	0.28	0.24	0.26	0.25	0.26	0.27	0.27	1.95 (0.03)	0.50 (0.61)
Too big problem for individual action to have any impact	0.52	0.57	0.46	0.58	0.62	0.54	0.59	0.54	0.51	0.55	0.55	0.54	0.52	0.54	0.54	0.91 (0.53)	0.86 (0.39)
Don't think it'll do any good	0.33	0.37	0.32	0.41	0.31	0.32	0.37	0.35	0.33	0.34	0.34	0.32	0.37	0.35	0.34	0.59 (0.85)	-0.95 (0.34)
Don't know what to do	0.67	0.69	0.61	0.71	0.54	0.66	0.68	0.66	0.65	0.67	0.64	0.69	0.68	0.67	0.66	0.56 (0.87)	-0.47 (0.64)

Note: Values in first 15 columns represent share of respondents in each region declaring the particular barrier as one of the obstacles for not taking more green actions. F-test provides a check whether there are statistically significant differences across all 13 regions simultaneously. T-test provides a check whether respondents in PACA are statistically different from respondents in the rest of France. Values in brackets are p-values of corresponding tests.

6. Conclusions and recommendations

This report presents findings of research on the beliefs, values, and behaviors of a geographically diverse French sample as they relate to global climate change. Consistent with other first-world countries, an overwhelming majority of French respondents indicated that they were certain that climate change is happening (EPCC 2017; Howe et al. 2014; Leviston et al. 2015; Reser et al. 2012a, 2012b; Spence et al. 2010; Yale Project 2017).

Extreme weather events appear to be playing a major role in shaping climate change perceptions. More than half of those surveyed reported having experienced major weather events such as storms, floods, or droughts, which they believed might be related to climate change. Experience with climate-related events, in turn, is positively related to climate change concern and the tendency to act on climate change in our sample. Nevertheless, as with other international samples, attitudinal, social, and economic factors appear to play an important role in determining the extent to which the respondents demonstrated a capacity and willingness for climate change adaptation, and a sizeable “value-action” gap was found.

When these results are compared with those from previous studies around the world, there are some strong similarities. For example, the current findings pertaining to the high rates of belief in climate change, the perceived role of human activity in the causation of climate change, and the low incidence of climate change deniers, are broadly consistent with previous research.

However, the observed levels of climate change concern and risk perception are somewhat higher than those that have typically been reported in the past. Compared to similar Australian research, for example, members of our sample typically viewed their region as less vulnerable to natural disasters and climate change threats, but they rated the condition of their natural environment less positively than in the Australian research.

Moreover, prior direct experiences of adverse environmental changes, circumstances or events were more closely associated with concerns about climate change in the current study than was previously found. Perhaps consistent with this, the present sample’s scores on scales measuring connection to nature and green self-identity were relatively high.

Table 6.1 Summary of group differences in climate change perceptions and responses

Demographic variable	Illustrative differences between groups
Gender	<p>Females reported higher risk perceptions, self-efficacy, and engagement in climate change mitigation actions.</p> <p>More males were classified as climate change deniers.</p>
Age	<p>Psychological adaptation was highest in respondents aged less than 35 years, knowledge was greatest in those aged 35-45 years, and green identity and mitigation behaviors were highest among those over 45 years.</p> <p>Belief in climate change, and risk perceptions, tended to decrease with age, whereas connection to nature increased with age.</p> <p>Respondents aged less than 25 years or over 65 years were disproportionately often climate change deniers.</p> <p>Those under 25 years scored below the sample mean on the green identity scale, while those over 65 years tended to have low self-efficacy.</p>
Educational attainment	<p>In general, climate change beliefs, concerns, risk perceptions, and psychological adaptation increased with educational attainment. A consistent exception to these trends was for the small number of respondents who hold doctoral qualifications to report low levels of climate change concerns, risk perceptions, self-efficacy, and psychological adaptation.</p> <p>Knowledge was highest among respondents with intermediate levels of educational attainment.</p> <p>Climate change deniers were over-represented among those with very low and those with very high educational attainment.</p>
Employment status	<p>Respondents employed full-time had relatively high climate change knowledge and risk perceptions.</p> <p>Students had low levels of connection to nature and green self-identity, but they had relatively high climate change knowledge and reported high risk perceptions and psychological adaptation. They also cited more severe barriers to action than did any other group.</p> <p>The unemployed were over-represented among climate change deniers and performed few actions to mitigate climate change impacts.</p> <p>Respondents who had retired from work had high levels of connection to nature and green self-identity. Despite low levels of self-efficacy and psychological adaptation, retirees performed many of the 14 mitigation actions.</p>
Household income	<p>Levels of psychological adaptation tended to increase with household income, although respondents who reported very high incomes were the exception to this. This latter group was also over-represented among climate change deniers.</p> <p>Self-efficacy was highest among middle-income earners.</p>

The profile emerging from this survey is thus one of a nation with quite high levels of concern about climate change and about their environment more generally. Coupled with this, however, was a relatively low mean level of self-efficacy, and a widely held view that others (companies, governments, and the international community), rather than individuals and their families, should take responsibility for action against climate change. These findings suggest real but not insurmountable challenges ahead with respect to mobilizing the French public to meaningful and sustained action on climate change

In addition to these between-nation and between-study comparisons, we have reported many analyses that compare different subgroups of the current sample. These analyses demonstrate that patterns of climate change perceptions, attitudes, and responses show considerable variation along demographic lines.

Several of these differences between demographic subgroups are summarized in Table 6.1. Identification of these distinctive patterns of responses has implications for recommendations regarding the emphases for future interventions that target these subgroups of the population. For example, the findings suggest that climate change communications targeting students should attempt to increase recipients' affinity with their natural environment, while also detailing strategies to overcome existent barriers to action. In contrast, interventions that target older persons may be well-advised to seek to enhance levels of self-efficacy and psychological adaptation.

Gifford (2011) proposed a taxonomy of factors likely to play a role in determining public risk perceptions, understanding, and responses to climate change, and more particularly, in identifying possible barriers to climate change action and adaptation. We use several of the elements within this framework to structure the discussion of the survey findings that follow, and we highlight some additional layers of complexity that governments and organized groups in France will need to consider when designing and implementing responses to climate change.

A first broad factor discussed by Gifford (2011) concerns the difficulty individuals have in decision-making when they have incomplete or insufficient information. Under this "limited cognition" explanation, two specific barriers are ignorance and uncertainty. Many members of the current sample displayed ignorance with respect to climate change factual knowledge, with more than one in six respondents answering more questions incorrectly than correctly. Knowledge of climate change facts that pertain to

France was especially poor. This suggests that there is an ongoing and critical role for communicators and policymakers to play in disseminating accurate, personally relevant, and actionable information about climate change to the French public. Furthermore, the absence of significant politicization of the issue in France (which stands in stark contrast to polarization in the U.S. and other anglophone countries, e.g., Dunlap and McCright 2015; Reser et al. 2012b) suggests that direct efforts at improving basic factual knowledge about the issue, particularly with respect to local impacts, may in fact have a significant positive impact on the French public's response to the issue.

With respect to the second specific barrier, uncertainty, although only a small minority of the current sample reported being 'not sure at all' about climate change, over two thirds (68.5%) reported they were less than extremely certain that climate change is happening. When it comes to taking decisive action, even marginal levels of uncertainty can leave sufficient room for individuals to feel comfortable, or at least not unbearably uncomfortable, with not taking steps to counter climate change (Gifford 2011). Furthermore, the existence of climate change deniers in France (although only one in 40 members of the current sample) raises the possibility that they will be over-represented in media and debate. Though they are perhaps unlikely to convince many of their arguments, they may further contribute to the level of uncertainty in the general population. Thus, efforts to highlight what is known about the issue with high levels of certainty (e.g., its causes, actions individuals and communities can take to adapt to future impacts) may be particularly successful in promoting positive behavior change (e.g., Cook 2016).

The complexity of climate change, and uncertainties as to when, where, and how dramatically it will affect our lives, tend also to contribute to general uncertainty and inaction. Gifford (2011) argues we are likely to discount our sense of urgency regarding climate change based on not just 'when', but 'where', with our sense of urgency being lower if we perceive the greatest risk of climate change occurring further from us. Consistent with this, residents of the Northernmost region of France, Hauts-de-France, held the greatest percentage of climate change deniers (5.52%) and the lowest level of certainty about climate change (4.55%). It is possible that, as with much of the rest of the world, climate change risk is perceived in terms of global warming, and for

people residing in the coldest region of France, it may be perceived as more likely to disadvantage those in warmer climates.

Ideologies relating to the socio-political system within which we live are also likely to contribute to the failure of individuals to take action against climate change. Of the groups considered to be most responsible for addressing climate change, French respondents were most likely to nominate industries and companies, followed by the international community, and national governments. Only 12.75% of the sample reported individuals and families as being primarily responsible for addressing climate change. Although this number was higher than in Spence et al.'s (2010) UK study (9.4%), those in both the UK and Australia were less likely to put their faith in industrial and company systems to address climate change (Reser et al. 2012a).

In addition to a lack of knowledge, certainty and sense of responsibility for individuals to address climate change, Gifford (2011) suggests that those who take steps to address the problem may succumb to tokenism (that is, the tendency to take only the cheapest and easiest actions to address climate change). As a result, individuals may not take further action after taking the first action even if that initial action is relatively inexpensive and ineffective (Weber 2006). This effect can perhaps be seen with 88% of the current respondents using fluorescent light bulbs, but only 57% trying to reuse items instead of buying new ones, and only 39% actively attempting to reduce their travel. Stopping at only one or a few mitigation actions due to tokenism may go some way to explaining the value-action gap

Compounding the effects of tokenism is the rebound effect, whereby after a brief period of mitigation effort, behaviors can rebound to reduce the overall benefit of the newly adopted measure. Continuing with the fluorescent light bulb example, members of our sample who have purchased energy saving light bulbs may end up feeling comfortable leaving the lights on longer than before because they have installed energy saving globes, which reduces the cost of leaving the lights on longer (for a similar example taken from a farming context, see Joireman et al. 2009).

The present report contains many positive observations. By and large, French respondents were highly accepting of the realities of climate change, concerned, willing to pay more for an energy-efficient appliance, and willing to take mitigation actions. Similar findings have been reported from other international populations, and there is still much to learn about public perceptions and actions, their causes and consequences

in France. Still, there is clearly room for improvement. Based on the results of the present study, we provide four concrete recommendations for improving the French public's responses to climate change in the coming years:

Recommendation 1: Develop a National Action Plan for climate change communication.

Such a plan should ensure that the response to climate change issues across all levels of government takes place in a coordinated manner and is sensitive to differences in perceptions of climate change across various demographic groups and regions of France. Every year millions of Euros are dedicated to communicating climate change issues to the European public. In order to improve the efficacy of such efforts, public information campaigns should take into account the evolving nature of public perceptions of climate change. Much research suggests that different audiences exist within the broad public and that these audiences will respond differently to different messages. Differences across groups and regions with respect to the full range of climate change variables, such as those highlighted in this report, provide a starting point for developing more targeted and tailored messages (Dietz 2013; Fischhoff 2013; Bostrom et al. 2013; Markowitz and Guckian 2018). For example, regional differences with respect to both perceived and objective future negative impacts of climate change (e.g., urban flooding versus declining agricultural yields) need to be incorporated into communication campaigns. To be effective, a National Action Plan on climate change communication must start from the assumption that a “one-size-fits-all” approach to communicating about this issue is bound to fail; rather, a tailored and targeted approach is called for (Bostrom et al. 2013), and such an approach should be based on the best available evidence.

Recommendation 2: Develop an ongoing monitoring system to track the impact of extreme weather events on public perceptions.

As extreme weather events become more frequent in future decades, it is vital to track how these alter the public's perceptions of climate change and their tendency to act on these perceptions. Our results suggest that extreme weather events have an important impact on the level of concern about climate change and citizens' willingness to act on climate change. Different types of extreme weather effects may have differing effects on willingness to act, suggesting that communicators and

policymakers need to account for regional differences in extreme weather risks and exposures. Integrating existing monitoring of extreme weather events with a new system for tracking individual-level impacts of such events (e.g., psychological, social, economic) could serve as a model for other nations while providing highly useful insight into how French citizens are preparing for, responding to and being affected by concrete climate change impacts in the future.

Recommendation 3: Develop a National Action Plan to tackle the barriers to action.

Results indicate that there is a large gap between citizens' concerns about climate change and the extent of their pro-environmental actions. What is urgently needed is a better understanding of the behavioral and economic barriers faced by citizens and the type of policies that can help overcome these barriers. Effective adaptation requires individuals to absorb complex scientific evidence on the impacts of climate change and choose between different adaptation options based on their perceptions of the costs and benefits. This will necessitate individuals to incorporate the uncertainties of climate change into their decision-making, but perhaps even more importantly, it will also require citizens to be provided with the information they need to make better decisions (while avoiding the pitfall of providing too much information, which can paralyze decision-makers). Past work (e.g., Gifford 2011) suggests that the value-action gap is likely to persist so long as behaviour and decision maker-specific barriers remain. In turn, this suggests that future efforts to narrow this gap must incorporate audience-specific pre-intervention research (e.g., surveys, focus groups, interviews) that allow policymakers and managers to identify specific, local barriers to action (McKenzie-Mohr and Schultz 2014). An effective approach to promoting positive behavior change will require a deeper understanding of the core motives and informational needs of French citizens, so that decision support tools and communication efforts can provide targeted information that helps people easily incorporate climate change impacts into their everyday and longer-term decision-making. For example, in Florida, a multi-agency, multi-stakeholder effort started in 2009 (the Southeast Florida Regional Climate Change Compact) works to bring actionable science and information to local decision-makers (including homeowners and business owners) in ways that allow appropriate incorporation of climate science into local decision-making, while

avoiding overtly political considerations from paralyzing action. Similar types of regional and national initiatives, while time- and effort-intensive, could go a long way towards supporting positive adaptation efforts throughout France.

Recommendation 4: Capitalize on existing levels of concern amongst the French public but do not assume unconditional support.

In contrast to the U.S., U.K., and Australia, climate change is not a politically polarizing or particularly controversial topic in France. Moreover, the current study suggests that French citizens are worried about the issue and want to see practical steps taken to protect themselves and their country from the worst effects of climate change in the future. At the same time, the issue is not a top-of-mind issue for many people. This means that policymakers will have to actively work to keep the issue a top-tier concern amongst their constituents to build additional support for action, including costly adaptation efforts. From a communications perspective, this suggests that policymakers, advocates and others need to continue finding ways to keep climate change in the public's consciousness, including active efforts to promote media coverage of the issue. However, it is important that such efforts continuously highlight practical steps that are and can be taken, both at the individual/household level and at the community/regional level, to make positive progress on the issue. Simply reminding people that climate change is happening and is going to cause negative impacts is likely counterproductive in terms of promoting sustained personal and collective action. Given that ignorance of what to do was the most commonly reported barrier to climate change action, communications should aim to increase citizens' procedural knowledge of mitigation strategies.

6a. Conclusions et recommandations (in French)

Ce rapport présente les résultats d'une étude sur les points de vue, les valeurs et les comportements d'un échantillonnage réparti dans toute la France et de leur corrélation avec le changement climatique dans le monde. Tout comme dans d'autres pays industrialisés, une vaste majorité de Français interrogés ont dit être convaincus que le changement climatique est en cours. (EPCC 2017 ; Howe et coll. 2014 ; Leviston et coll. 2015 ; Reser et coll. 2012a, 2012b ; Spence et coll. 2010 ; Projet Yale 2017).

Les phénomènes météorologiques extrêmes semblent jouer un rôle primordial dans la façon dont ils influencent la perception du changement climatique. Plus de la moitié des personnes interrogées ont affirmé avoir été témoins de phénomènes climatiques graves tels que des tempêtes, inondations ou périodes de sécheresse dont ils pensent qu'ils sont liés au changement climatique. Les phénomènes météorologiques extrêmes semblent également jouer un rôle primordial dans la façon dont ils influencent la perception du changement climatique parmi les personnes interrogées. Toutefois, comme le montrent d'autres études internationales, les facteurs sociaux, économiques et d'attitude semblent aussi jouer un rôle important pour établir dans quelle mesure les personnes interrogées se sentent la capacité ou la volonté de s'adapter au changement climatique. Un écart valeurs — engagement vert de taille a été relevé.

Si l'on compare ces résultats avec ceux d'études précédentes réalisées dans le monde, les similitudes sont importantes. Par exemple, les résultats présents sur le taux élevé de personnes qui pensent que le changement climatique est bien réel, l'attribution des causes du changement climatique à l'activité humaine et la faible proportion de négateurs sont dans l'ensemble fidèles aux études précédentes.

Toutefois, l'inquiétude et la perception des risques ont été observées à des niveaux un peu plus importants que par le passé. En comparaison avec des études similaires menées en Australie par exemple, les personnes de notre échantillon pensent typiquement que leur région est moins sujette aux catastrophes naturelles et aux risques liés au changement climatique. Par contre, ils ont moins bien noté l'état de leur environnement naturel que les personnes interrogées en Australie.

En outre, les cas vécus de la détérioration de l'environnement, ou de situations ou phénomènes dus au changement climatique étaient plus étroitement reliés à l'inquiétude causée par le changement climatique dans cette étude que dans les

Table 6.2 Résumé des différences entre les groupes sur la perception et les réactions face au changement climatique

Variable	Exemples de différences selon les groupes
Sexe	<p>La perception des risques, l'auto-efficacité et l'engagement vert visant l'atténuation du changement climatique sont plus importants chez les femmes.</p> <p>Les négateurs du changement climatique se trouvent en plus grand nombre chez les hommes.</p>
Âge	<p>Les résultats les plus élevés ont été trouvés chez les moins de 35 ans pour l'adaptation psychologique, chez les 35-45 ans pour la connaissance et chez les plus de 45 ans pour l'identité verte et les comportements d'atténuation.</p> <p>Les négateurs du changement climatique se trouvent souvent de manière disproportionnée parmi les moins de 25 ans et les plus de 65 ans.</p> <p>Les moins de 25 ans sont sous la moyenne de l'échantillon sur la mesure de l'identité verte alors qu'on note chez les plus de 65 ans une moindre auto-efficacité.</p>
Niveau d'études	<p>risques et l'adaptation psychologique liées au changement climatique augmentent avec le niveau d'études.</p> <p>Une exception constante à ces tendances réside dans les quelques diplômés du troisième cycle à indiquer un niveau d'inquiétude, une perception des risques, une auto-efficacité et une adaptation psychologique faibles face au changement climatique.</p> <p>Une meilleure connaissance du sujet se trouve parmi les personnes ayant atteint un niveau d'étude intermédiaire.</p> <p>Les négateurs du changement climatique sont surreprésentés parmi ceux qui ont un niveau d'études très bas ou au contraire très élevé.</p>
Situation de l'emploi	<p>Les employés à temps plein font preuve d'une connaissance sur le changement climatique et d'une perception des risques comparativement étendues.</p> <p>On trouve chez les étudiants un faible degré de connexion à la nature et d'identité verte mais des résultats comparativement élevés ont été notés sur la connaissance, la perception des risques et l'adaptation psychologique. C'est également dans ce groupe qu'ont été cités le plus d'obstacles à l'engagement vert.</p> <p>Les chômeurs sont surreprésentés parmi les négateurs du changement climatique et agissent peu pour en atténuer les impacts.</p> <p>Les retraités montrent un plus haut niveau de connexion à la nature et une identité verte plus forte. Malgré un faible niveau d'auto-efficacité et d'adaptation psychologique, les retraités accomplissent une grande partie des 14 actions d'atténuation.</p>
Revenus des ménages	<p>L'adaptation psychologique a tendance à augmenter proportionnellement aux revenus des ménages ; par contre, les personnes à très hauts revenus constituent une exception à cette tendance. Ces dernières sont également surreprésentées parmi les négateurs du changement climatique.</p> <p>C'est dans le groupe des salariés à revenus moyens que l'auto-efficacité est la plus élevée.</p>

précédentes. Les résultats de cet échantillon sur le barème mesurant connexion à la nature et égo-identité verte sont relativement élevés, ce qui semble cohérent.

Ainsi, le profil qui se dégage de ce sondage est celui d'une nation assez inquiète du changement climatique et de son environnement en général. Parallèlement cependant, le sentiment d'auto-efficacité est relativement faible et l'idée très répandue que la responsabilité d'agir face au changement climatique incombe aux autres (aux entreprises, aux gouvernements et à la communauté internationale) plutôt qu'aux individus et leur famille. Ces résultats laissent entrevoir pour l'avenir des défis réels mais surmontables pour mobiliser les Français afin qu'ils s'engagent dans des actions vertes dignes de ce nom et durables.

Au-delà de ces comparaisons entre différents pays et études, nous avons présenté un grand nombre d'analyses comparant les différents sous-groupes de l'échantillon présent. Ces analyses révèlent une importante variation sur les courbes démographiques des modèles de perception du changement climatique, d'attitudes et de réactions.

Certaines de ces différences entre les sous-groupes démographiques sont résumées dans le tableau 6.1. L'identification de ces modèles spécifiques a une incidence sur les recommandations concernant l'orientation à adopter lors de futures interventions ciblant ces sous-groupes. Par exemple, il ressort des résultats que la communication sur le changement climatique ciblant les étudiants devrait tenter de promouvoir la connexion du groupe cible avec son environnement naturel tout en présentant les moyens de surmonter les obstacles qui les empêchent de s'engager. En revanche, les interventions ayant pour cible les groupes de personnes plus âgées devraient plutôt chercher à renforcer les sentiments d'auto-efficacité et les moyens de s'adapter psychologiquement.

Gifford (2011) a proposé une taxinomie de facteurs susceptibles de jouer un rôle pour définir dans la population la perception des risques, la compréhension et les réactions face au changement climatique, et plus précisément pour identifier les éventuels obstacles à l'engagement vert et à l'adaptation. Nous utilisons quelques-uns de ces éléments dans ce cadre afin de donner une structure au débat sur les résultats de l'enquête. Nous mettons aussi en évidence des couches de complexité que le gouvernement et les organisations devront prendre en compte en France pour la création et la mise en place d'initiatives face au changement climatique.

Le premier facteur général abordé par Gifford (2011) concerne la difficulté qu'éprouvent les individus à prendre des décisions lorsque l'information dont ils disposent est insuffisante ou absente. De cette explication de la *cognition limitée* émanent deux obstacles précis : l'ignorance et l'incertitude. Un grand nombre de personnes dans l'échantillon présent ont fait preuve d'une méconnaissance des faits concernant le changement climatique, une personne sur six ayant donné plus de mauvaises que de bonnes réponses. La connaissance des faits sur le changement climatique touchant directement la France s'est révélée particulièrement faible. Cela indique que les communicateurs et les responsables politiques ont un rôle actuel essentiel dans la diffusion d'informations sur le changement climatique auprès des Français, ces informations devant présenter un intérêt pour les individus et être à la fois exactes et exploitables. De plus, l'absence d'une politisation forte du sujet en France (contrairement à sa polarisation aux États-Unis et autres pays anglophones par exemple, Dunlap et McCright 2015 ; Reser et coll. 2012b) porte à croire que les efforts directs pour améliorer une connaissance de base des faits sur la question, surtout s'agissant des conséquences locales, pourraient en fait avoir un impact positif sur la prise d'initiative des Français pour répondre au problème.

Quant au second obstacle, à savoir l'incertitude, bien qu'une petite minorité du présent échantillon ait indiqué ne pas être sûre du tout que le climat change, plus des deux tiers (68,5 %) ont dit être moins qu'*extrêmement sûrs* de la réalité du changement climatique. Lorsqu'il s'agit de décider d'agir, tout doute, aussi infime soit-il, peut créer un sentiment de confort suffisant, en tout cas rien qui soit insupportable, qui se traduira par une absence d'action pour lutter contre le changement climatique (Gifford 2011). De plus, la présence de négateurs du changement climatique en France, même si l'on n'en compte qu'un sur 40 dans notre échantillon, augmente la probabilité de leur surreprésentation dans les médias et les débats. Bien que leurs arguments ne soient peut-être pas très convaincants, ils pourraient contribuer au sentiment d'incertitude de la population en général. Les efforts pour attirer l'attention sur ce que l'on connaît du sujet de façon très certaine (par exemple les causes du changement climatique, ou comment les individus et les communautés peuvent agir pour s'adapter aux conséquences à venir) pourraient donc vraiment parvenir à favoriser un changement de comportement bénéfique (par ex. Cook 2016).

La complexité du changement climatique et les incertitudes à savoir quand, où et à quel point il affectera nos vies ont également tendance à contribuer au sentiment général d'incertitude et à l'inaction. Gifford (2011) affirme que les raisons pour lesquelles nous ne tenons probablement pas compte du sentiment d'urgence concernant le changement climatique ne reposent pas sur la question de savoir seulement *quand* mais également *où*, la distance entre nous-mêmes et les zones où les risques liés au changement climatique sont les plus importants ayant pour effet de diminuer notre sentiment d'urgence.

En même temps, les habitants des Hauts-de-France, région tout au nord de la France, ont le plus haut pourcentage de négateurs du changement climatique (5,52 %) et le plus bas niveau de certitude vis-à-vis du changement climatique (4,55 %). Il est possible que, comme dans le reste du monde, les risques liés au changement climatique soient perçus du point de vue du réchauffement climatique. Ceux qui vivent dans les régions de France les plus froides peuvent se sentir moins concernés et avoir l'impression que ce seront plutôt les habitants des régions plus chaudes qui en subiront les inconvénients.

Les idéologies en rapport avec le système socio-politique à l'intérieur duquel nous vivons peuvent également contribuer à l'inaction des individus face au changement climatique. Parmi les groupes considérés comme avoir prioritairement la responsabilité d'apporter une réponse au changement climatique, les Français ont plus facilement cité les industries et les entreprises, suivies par la communauté internationale et les gouvernements nationaux. Seulement 12,75 % de l'échantillon ont attribué la responsabilité d'agir face au changement climatique principalement aux individus et aux familles. Ce chiffre est plus élevé que celui de l'étude britannique de Spence et coll. (2010), mais au Royaume-Uni comme en Australie, les personnes interrogées étaient moins disposées à faire confiance aux industries et aux entreprises pour lutter contre le changement climatique (Reser et coll. 2012a).

En plus du manque de connaissance, de certitude et du sens de responsabilité des individus pour faire face au changement climatique, Gifford (2011) observe que ceux qui prennent des initiatives pour affronter le problème du changement climatique pourraient se satisfaire de mesures symboliques (autrement dit céder à la tendance à n'entreprendre que les mesures les plus faciles et les moins coûteuses). Les individus pourraient donc ne pas donner suite à leur toute première action, même lorsque celle-

ci est assez peu coûteuse et inefficace (Weber 2006). L'effet peut peut-être observé dans les 88 % de personnes interrogées qui utilisent des ampoules fluorescentes alors que seulement 57 % d'entre elles essaient de réutiliser des objets au lieu d'en acheter de nouveaux, et seulement 39 % essaient activement de réduire leurs déplacements. Ne pas aller au-delà d'une action ou de quelques rares actions parce qu'on agit uniquement pour la forme pourrait expliquer au moins en partie l'écart valeurs – engagement vert.

Vient aggraver les effets de l'action purement symbolique, l'effet rebond par lequel, après une courte période d'efforts d'atténuation, les comportements peuvent reprendre et réduire l'ensemble du bénéfice des mesures nouvellement adoptées. Pour poursuivre avec l'exemple de l'ampoule fluorescente, les personnes de notre échantillon qui ont acheté des ampoules à faible consommation d'énergie pourraient du coup se sentir moins coupables de laisser les lumières allumées plus longtemps simplement parce qu'ils ont installé des ampoules à économie d'énergie qui réduisent le coût d'avoir les lumières allumées plus longtemps (cf. Joiremann et coll. 2009 pour un exemple comparable pris dans un contexte agricole).

Le présent rapport comporte beaucoup d'observations positives. Globalement, les Français ont montré qu'ils acceptent très bien les réalités du changement climatique, qu'ils sont inquiets, et qu'ils sont prêts à prendre des mesures d'atténuation et à payer plus pour des appareils à haut rendement énergétique. Des résultats similaires ont été observés provenant d'autres populations dans le monde et il nous reste encore beaucoup à apprendre sur la France à l'égard des perceptions et des actions du public, des causes et des conséquences. Il reste tout de même encore beaucoup de chemin à parcourir. En nous appuyant sur les résultats de l'étude présente, nous fournissons quatre recommandations concrètes pour améliorer les initiatives des Français face au changement climatique dans les années à venir :

Recommandation 1 : Élaboration d'un plan d'action national pour une communication sur le changement climatique.

Un tel plan devrait s'assurer que les initiatives prises à tous les niveaux du gouvernement pour répondre aux problèmes engendrés par le changement climatique sont coordonnées et prennent en compte les différences de perception du changement climatique selon les groupes démographiques et les régions de

France. Chaque année, des millions d'euros sont consacrés à la communication auprès des Européens sur la question du changement climatique. Pour améliorer l'efficacité de tels efforts, les campagnes d'information publique devraient tenir compte de la nature évolutive de la perception du changement climatique chez les gens. Une grande partie de la recherche fait observer qu'il existe diverses audiences au sein du plus grand public et que ces audiences réagiront différemment à des messages différents. Les différences observées selon les groupes et les régions à l'égard de variables telles que celles mises en évidence dans ce rapport, fournissent un point de départ pour l'élaboration de messages mieux adaptés et ciblés (Dietz 2013 ; Fischhoff 2013 ; Bostrom et coll. 2013 ; Markowitz et Guckian 2018). Par exemple, les campagnes de communication doivent intégrer les différences régionales sur les futurs impacts négatifs du changement climatique, qu'ils soient ressentis ou objectifs (par exemple les inondations urbaines versus le déclin de la production agricole). Pour être efficace, un plan national d'action pour la communication sur le changement climatique doit partir du principe qu'une approche identique pour tous est vouée à l'échec. Une approche adaptée et bien ciblée est nécessaire (Bostrom et coll. 2013) et devrait s'appuyer sur les meilleures informations possibles à disposition.

Recommandation 2 : Élaboration d'un système de contrôle continu pour suivre l'impact des phénomènes climatiques extrêmes sur la perception de la population.

Comme les phénomènes climatiques extrêmes seront plus fréquents dans les décennies à venir, il est indispensable d'observer comment ils affectent les perceptions du public vis-à-vis du changement climatique ainsi que leur propension à agir sur ces perceptions. Les résultats que nous avons obtenus indiquent que les phénomènes climatiques extrêmes impactent fortement le degré d'inquiétude face au changement climatique et la volonté des individus de réagir face au changement climatique. Différentes sortes de répercussions climatiques extrêmes peuvent entraîner des conséquences différentes sur la volonté d'agir, ce qui permet de penser que les communicateurs et les responsables politiques doivent tenir compte des différences régionales concernant les risques et les expositions aux phénomènes climatiques extrêmes. Le fait d'intégrer les phénomènes climatiques extrêmes actuels dans un nouveau système de façon à surveiller les impacts de ces

phénomènes sur un plan individuel (psychologique, social et économique entre autres), pourrait servir de modèle dans d'autres pays tout en permettant de mieux comprendre comment les Français se préparent, réagissent et sont affectés par les impacts concrets du changement climatique à venir.

Recommandation 3 : Élaboration d'un plan national d'action pour lutter contre les obstacles à la prise d'initiative.

D'après les résultats, il existe un décalage important entre le niveau d'inquiétude des individus face au changement climatique et leur engagement dans des actions pro-environnementales. Il est urgent de mieux comprendre les obstacles comportementaux et économiques auxquels sont confrontés les individus ainsi que les types de décisions qui peuvent aider à éliminer ces obstacles. Une adaptation efficace demande aux individus d'assimiler des informations scientifiques complexes sur les conséquences du changement climatique et de choisir entre plusieurs options d'adaptation en fonction de leur perception du coût et des résultats.

Cela signifie que les individus devront intégrer les incertitudes du changement climatique dans leurs décisions, mais il faudra aussi, ce qui est peut-être encore plus important, leur fournir l'information dont ils ont besoin pour prendre de meilleures décisions (tout en évitant l'écueil de leur donner trop d'informations, ce qui peut paralyser la prise de décision). Le travail réalisé dans le passé (Gifford 2001 par exemple) laisse entendre que l'écart valeurs – engagement vert persistera vraisemblablement tant que les obstacles propres au comportement et à la prise de décision subsisteront. Cela sous-entend ensuite que les futures mesures visant à réduire cet écart devront intégrer des recherches préalables adaptées à l'audience-cible (tels que sondages, groupes de discussions ou entretiens) qui permettront aux responsables politiques et aux gestionnaires d'identifier au niveau local les obstacles précis à la prise d'initiative (McKenzie-Mohr et Schultz 2014). Une approche efficace pour encourager un changement de comportement positif demandera une compréhension plus complète des motivations profondes et des besoins d'information des Français. C'est ce qui permettra aux outils d'aide à la décision et aux opérations de communication de procurer une information ciblée permettant aux gens d'intégrer facilement les impacts du changement climatique à leurs décisions au quotidien et dans la durée. En Floride par exemple, une initiative

multiservices avec de multiples partenaires qui a débuté en 2009 (le *Southeast Florida Regional Climate Change Compact*) est à l'œuvre pour apporter des connaissances scientifiques et des informations permettant aux décideurs locaux (propriétaires et entrepreneurs inclus) d'agir de manière à ce que les décisions soient prises en tenant compte des connaissances en climatologie tout en évitant que les considérations ouvertement politiques viennent paralyser l'action.

Des initiatives régionales et nationales similaires seraient certes gourmandes en temps et en efforts, mais pourraient vraiment contribuer à soutenir les opérations d'adaptation positive dans toute la France.

Recommandation 4 : Exploitation de l'inquiétude existante chez les Français mais sans partir du principe qu'un soutien inconditionnel sera obtenu.

Contrairement à ce qui se passe aux États-Unis, au Royaume-Uni et en Australie, le changement climatique n'est pas en France un sujet politiquement diviseur ou particulièrement polémique. De plus, la présente étude indique que les Français sont inquiets et veulent voir des actions concrètes qui les protégeront dans le futur, eux et leur pays, des effets les plus graves du changement climatique. Dans le même temps, ce n'est pas le premier sujet de préoccupation pour beaucoup d'entre eux. Ceci signifie que les responsables politiques devront œuvrer activement pour faire en sorte que la question reste au premier plan des préoccupations du groupe concerné pour obtenir davantage de soutien à l'action, y compris pour des efforts d'adaptation coûteux. Du point de vue de la communication, cela sous-entend que responsables politiques, militants et autres doivent continuer à faire en sorte que le changement climatique reste présent dans l'esprit des gens, et à en favoriser la couverture médiatique. Cependant, pour faire de réels progrès sur la question, il est important que ces efforts continuent de mettre en avant les mesures qui sont prises et celles qui peuvent l'être, aussi bien au niveau individuel/familial qu'au niveau communautaire/régional. Le simple fait de rappeler aux gens que le changement climatique est en cours et va avoir des conséquences négatives est probablement contre-productif si l'on veut encourager une action individuelle et collective durable. Étant donné que le sondage a montré que l'obstacle principal à l'action est le fait que les gens ignorent ce qu'ils peuvent faire, la communication devrait avoir pour objectif d'améliorer la connaissance procédurale des stratégies d'atténuation.

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