Understanding Drivers of Consumer Response to Climate Change Amelioration Policies

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Abstract

This paper examines public support for climate change amelioration policies by advancing a model of individual evaluation processes and calibrating it for scientists and members of the public. Previous studies have identified substantial disconnects between the urgency with which climate change scientists perceive the need for amelioration strategies and the support of those strategies amongst members of the general public. Our research objective is to trace sources of that gap in terms of the component beliefs in a mid-ranked OECD country. The longitudinal nature of our data enable us to observe that the views of the public are reasonably stable over time, despite increased evidence of the effects of global warming.

Keywords: *Sustainability, Climate change, Stakeholders*

Track: ***Social Responsibility and Ethics***

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1. Introduction

Climate change and policies to address its potential effects on members of the general public have attracted considerable interest and controversy over the past ten years (see, for example, the Intergovernmental Panel on Climate Change (IPCC) 2014).

In particular, there appears to be a divergence in the level of support for action between physical and social scientists studying the subject on the one hand, and members of the general public on the other (Lorenzoni and Pidgeon 2006, Oreskes 2004, Lovelock 2007).

We investigate the reasons of this divergence. There is considerable ambiguity about its source, with the primary cause cited being the large minority that denies the existence of climate change (e.g., see Bain *et al.* 2012). Clearly, the appropriate form of communication if one accepts climate change scientists' argument of the need for action, depends totally on the source of scientist-public opinion divergence. There is little empirical evidence to address this question. It is only recently that this problem has been framed as a marketing one (e.g., Maibach *et al.* 2008; Hansen and Machin 2008). We address the issue by presenting a framework which traces potential areas from which these disconnects may arise. We calibrate that framework using a sample of climate change scientists and members of the general public and examine how attitudes to climate change have been evolving in Australia over a two year period for the latter group. We use these data to draw some conclusions about communication challenges facing scientists in promulgating their beliefs about the importance and urgency of climate change amelioration policies.

2. The importance of climate change

Following on from the Stern (2006) Report, the Intergovernmental Panel on Climate Change (IPCC 2014) has spelt out the dangers of climate change in terms of increased temperatures leading to flooding, sea level rises, droughts, climatic variability and their associated consequences on human activity. This academic work has been complemented by articles espousing a variety of positions in the popular press. For example, recently the *New York Times* has run a number of articles on the subject (e.g. Kopicki 2014, Porter 2014).

The primary questions of climate change policy from a research perspective are twofold. The first concerns one of social equity (both cross-sectionally across geographies, and longitudinally inter-generationally). The second has to do with heuristics and biases; people may make decisions which they would agree are not in their long term interests, as defined by

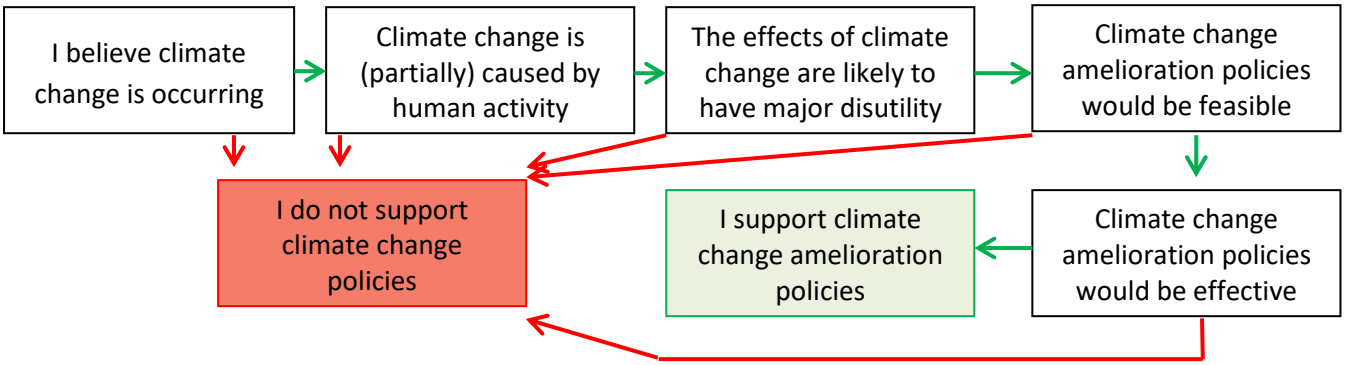
themselves. In this paper we are more interested in the latter research question than the former (and it is one for which marketing has developed a number of useful tools to investigate).

3. Climate change attitudes using traditional economic models

Considering the nature and effects of climate change is a difficult task for members of the general public. The degree to which climate change is occurring appears uncertain, as do its effects. The extent to which policies can ameliorate climate change is also at least partially unknown. Finally, the costs and benefits of actions are spread unevenly over time, requiring some form of implicit discounting. The result is that general population support for specific climate change amelioration policies is low relative to the views of scientists who specialize in this area. For example, Morales (2014) questioned whether the community would or should support climate change amelioration strategies if they led to a reduction in GDP of 4%. Some scientists have suggested that climate change could lead to a planet that could only support a fraction of its current 7 billion by 2050, with billions more being displaced (e.g., IPCC 2014). To illustrate the size of this disconnect, using expected utility analysis, if we assume that would lead to a reduction in GDP of 50%, a risk neutral person would believe that if there was more than a one in 12½ chance of the scientists being right and policies being able to address it, amelioration should be undertaken. It is useful to use attitude-belief models to trace the sources of this disconnect (e.g., Raghubir *et al.* 2010), including the antecedents of tepid climate change amelioration policy support.

4. A Model of Climate Change Support

To address this problem, we propose a model of when we expect members of the general public (and other stakeholders, including scientists) to support public policy amelioration strategies. To do so, we suggest the logical sequence illustrated in Figure 1. We understand that people may not undergo the exact evaluation process suggested by this model, but it does provide a benchmark against which to calibrate the public's reservations and also to contrast the belief structures of different stakeholders, by identifying many of the issues involved.



Hypothesized relationships leading to climate change policy support ↓ or not ↓.

Figure 1: Representation of possible evaluation process of support for climate change amelioration policies

We suggest that climate change amelioration policy support is unlikely amongst those who do not believe in climate change, do not think that it is a naturally occurring phenomenon, do not feel as though its effects will be severe, are of the view that there is nothing that can be done to mitigate it, or (finally) think that such policies would not work.

5. Understanding sources of disconnect: Calibrating the model

To understand the extent to which scientists and members of the general public differ in their support for climate change mitigation policies and where disconnects occur in the antecedents in that process, in March 2012 we surveyed both groups. We bought an online panel of 2746 members of the general public, representative of the Australian public aged over 18. For scientists, we undertook a web search of university and other research institution scientists using key words such as "climate change" and "sustainability." This should capture those engaged in the debate on both sides. Of the 397 scientists we approached, 117 responded. We also classified scientists into social and physical scientists. We repeated the survey in March 2014 with 4774 members of the general public.

We used the same instrument for both scientists and the general public (and from one wave to the next). While these two groups tend to use different language, we had two reasons for this. First, we wished to compare answers from the two groups and to be able to do so, we needed exactly the same stimulus. Second, if communication is to be possible between these two groups, they need to have a shared language. The questionnaire reflected the model outlined in Figure 1. In particular, we included measures on:

- Climate change (Happening now / will happen in 5 years/ respondent certainty / extent to which it is happening now / extent to which it will happen in 5 years)
- Outcomes of climate change (Degree to which the following results will occur: floods, drought, food production, etc.)
- Battery of beliefs (Complexity, role of players, locus of responsibility)
- Evaluations of possible actions to ameliorate climate change (Feasibility, effectiveness, respondent level of support)

Where possible we used items validated in previous research (e.g., Dunlap *et al.* 2000).

6. Results

The first step we undertook was to compare beliefs of scientists with those of the general population about climate change. The results of this are presented in Table 1:

Beliefs about climate change:	Scientists (wave 1) % agree	General Population (wave 1) % agree	General Population (wave 2) % agree
Climate change is happening at present	**96.6%**	73.6%	78.7%
Uncertain of climate change happening	17.9%	19.4%	17.7%
More extreme weather events now than in past	61.5%	**50.2%**	**74.1%**
Totally/partially caused by human activity	72.6%	**32.5%**	**40.5%**

Table 1: Beliefs in climate change: Scientists and the General Public in 2012 and 2014

In 2012, there was near unanimity amongst scientists that climate change was occurring, with about three quarters believing that this was due to human activity. That contrasted to approximately three quarters of the general public believing that climate change was happening, but less than a third believing that human activity was at least partially responsible for it. Interestingly, both groups had a similar level of certainty. By 2014 (two years later), belief in climate change by the general public had increased by 5% and attribution to human activity by 8%. Some of this may be attributable to an almost 50% rise in awareness of extreme weather events (from 50.2% to 74.1%). That is, we see the first source of scientist-public disconnect occurs more on the role of human activity than disagreement about the phenomenon itself.

To move to the third potential source of disconnect in Figure 1, in Table 2 we examine the likely effects of climate change according to scientists and the general public (only for those respondents who believed that climate change was occurring).

The degree of convergence between the two samples (using only climate change believers) is remarkable. The correlation between the two sets of scores is 0.94 and the average is similar (2.93 for scientists and 3.05 for the general public). In the two years to 2014, beliefs amongst the general public in the outcomes emanating from climate change had increased by about 0.2 (or more) on a five point scale for every outcome. That is, the population at large is just as concerned about the effects of climate change as are the scientists, and yet this is a frequently used argument harnessed by scientists to galvanize the public to support amelioration action (e.g. Gillis 2014).

Extent to which Climate Change will be cause:	Scientists (wave 1)	General Population (wave 1)	General Population (wave 2)
Changing weather patterns	3.25	3.35	3.56
Floods	3.14	3.24	3.45
Drought	3.18	3.23	3.53
Biodiversity decreases	2.99	3.09	3.39
Community health problems	2.62	2.75	3.05
Reduced personal income	2.23	2.60	2.80
Reduced food production	2.74	2.99	3.27
Rise in sea levels	**3.38**	3.17	3.44
Reduced availability fresh water	2.85	3.01	3.33

Table 2: Contrasting Scientists and the General Public: Effects of Climate Change over the next 5 years (Key: 1=not at all, 5=totally)

Having established the level of beliefs about climate change and its severity, we proceeded to elicit both groups' evaluations of a series of public policy initiatives that have been proposed to ameliorate the effects of climate change (e.g., see IPCC 2014). The results outlining the perceived effectiveness of different measures are presented as Table 3.

Level of effectiveness for possible policies to combat Climate change	Scientists (wave 1)	General Population (wave 1)	General Population (wave 2)
Government subsidies for energy efficient household equipment	2.85	2.90	3.14

Government subsidies for energy efficient business equipment	2.94	3.00	3.24
Government support for Emission trading system	3.28	2.71	3.08
Increased investment in renewables	**3.97**	**3.46**	**3.69**
International standard for more energy efficient products	**3.47**	3.34	3.53
Introduction of a carbon tax	**3.43**	2.27	2.75
Education about actions to reduce CC	3.16	3.24	3.39
Improvements in public transport	3.35	3.21	3.48
Investment in fuel efficient vehicles	3.23	3.39	3.58

Table 3: Contrasting Scientists and the General Public: Perceived Effectiveness of Various Climate Change Amelioration Policies (Key: 1=not at all, 5=totally)

One thing that emerges from Table 3 is the greater appetite for scientists for a price on carbon either by an emissions trading scheme or a carbon tax, relative to the general public. Interestingly, the gap narrowed in the period 2012 to 2014, by a factor of approximately one half. It is also worthy of note that these policies seem in keeping with recent trends overseas. Another observation is the relatively greater appetite for economic incentives (such as renewable subsidies) than for economic disincentives (such as the carbon tax) amongst members of the general public). Scientists prefer sticks, while the public likes carrots.

Level of support for possible actions to combat CC	Scientists (wave 1)	General Public (wave 1)	General Public (wave 2)
Govt subsidies for energy efficient household equipment	4.38	4.21	3.95
Govt subsidies for energy efficient business equipment	4.27	4.09	3.83
Govt support for Emission trading system	4.32	3.50	3.44
Increased investment in renewable energy	**4.82**	**4.35**	**4.15**
International standard for more energy efficient products	4.63	4.24	4.03
Introduction of a carbon tax	4.40	2.65	2.81
Education about actions to reduce CC	4.75	4.26	4.01
Improvements in public transport	**4.84**	**4.48**	**4.29**
Investment in more fuel efficient vehicles	4.64	4.38	4.20

Table 4: Contrasting Scientists and the General Public: Support for Various Climate Change Amelioration Policies (Key: 1=not at all, 5=totally)

The question arises as to how important these factors are in determining policy support. To investigate that question we regressed the first principal component of support for public policies on elements hypothesized in Figure 1, reported in Table 5. What is clear from Table 5 is that while drivers ("Inaction will cost more") and barriers ("More information is needed") are important, as is a belief in anthropogenic climate change and its effects, by far the largest determinant of amelioration policies is a belief that they will be effective. This is an issue which receives almost no publicity in the climate change debate (eg, Bain *et al.* 2012)

Explanatory Variable: Support for CC	β (Standardized coefficient)	Significance
Feasibility of climate change policies	+0.02	n.s.
Provides an Effective solution	+0.37	0.01
Climate change affects weather	+0.06	0.01
Climate change due to human activity	+0.07	0.01
I need more information to decide	-0.10	0.01
Inaction now will cost more later	+0.17	0.01
Fit ($\bar{R}^2$)	0.336	

Table 5: Variables Associated with Support for Climate Change Amelioration Policies (DV)

7. Summary and Implications for climate change amelioration

It is clear that there is a disconnect between the views of scientists and those of the general public. Much of this comes from the public questioning whether climate change is anthropogenic. These beliefs do drive support for policies and therefore, governments that wish to adopt new policies should address these perceptions. While not so obvious from the data here, discussions with scientists showed them to be generally very unwilling to enter the debate in terms meaningful or accessible to the public. Perhaps unsurprisingly, for scientists being right and precise is much more important than being understandable. Finally, for researchers, it is clear that many behavioral issues such as framing, social normative beliefs, and self-construal are important in establishing the context in which the public evaluated climate change. As a complement to this research, future research needs to undertake laboratory work to understand the relative effect of these behavioral factors on the public policy evaluation process.

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