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# Towards a Model of Societal Pro-Environmental Attitudes: A Short Study of Environmental Knowledge

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Towards a Model of  
Societal Pro-Environmental Attitudes:  
A Short Study of Environmental Knowledge

Andrew Wainwright

17th January 2020

# Introduction

This paper sets out the design of a small piece of primary research, to be conducted between January and March, 2020 at the University of Bath.

The research is intended as a pilot for a larger study, to run between March and August 2020, investigating the effect of “Fake News” on pro-environmental attitudes.

## Societal Pro-Environmental Attitudes

“Numerous theoretical frameworks have been developed to explain the gap between the possession of environmental knowledge and environmental awareness, and displaying pro-environmental behavior. Although many hundreds of studies have been undertaken, no definitive explanation has yet been found.”

Kollmuss and Agyeman, 2002, p.239

“Psychohistory dealt not with man, but with man-masses. It was the science of mobs; mobs in their billions. It could forecast reactions to stimuli with something of the accuracy that a lesser science could bring to the forecast of a rebound of a billiard ball. The reaction of one man could be forecast by no known mathematics; the reaction of a billion is something else again.”

Asimov, 1952, Foundation and Empire, p.16

The “value-action gap” (or “attitude-behaviour gap”) that Kollmuss and Agyeman refer to is a real puzzle. We do not yet have a theory which will allow us to consistently associate pro-environmental behaviour to any input or collection of inputs with high correlation. Indeed, a meta-analysis of studies of pro-environmental behaviour found that on average, intention only predicts 27% of the variance of behaviour (Bamberg and Moser, 2007).

The study of attitudes is fraught with many issues. Attitudes are not visible, and cannot be measured with any physical device. They are personal, and the individual may be unwilling to reveal them, directly or indirectly. They are sometimes inconsistent, both over time, and also between objects, conflicting with other attitudes the individual may hold. Furthermore they may often not fully be understood by the individual themselves (Oppenheim, 2000).

Forming a social construct such as *societal* pro-environmental attitudes starts with these issues and then introduces the further challenge of comparing attitudes between individuals. Yet there are many instances of quantities which are hard to model on an individual basis but simpler in aggregate (for example, the movement of molecules in a gas, the path of raindrops on a window, or the spread of infectious diseases). It is possible that pro-environmental attitudes are another such thing: hard to measure at the individual level but more amenable to study at the societal level.

In this paper, pro-environmental attitudes are taken to mean a willingness by the individual to undertake actions in support of the environment which are to some degree costly to the individual. Note that this is an *intent*-based definition, treating people as having high levels of pro-environmental attitude even if their

actual *impact* on the environment is negative (Bamberg, 2015)<sup>1</sup>. *Societal* pro-environmental attitudes can then be defined simply as the percentage of a given population with positive pro-environmental attitudes.

Societal pro-environmental attitudes are important because governments and firms are, at times, highly influenced by popular opinion. Hobolt and Klemmensen (2005) find signs of a one-year lag between opinion and government action, for instance. If we were able to construct a model of societal pro-environmental attitudes then it might be possible to predict that governments and firms would take economically and politically costly action on the environment only when societal pro-environmental attitudes obtain a certain level.

Currently however, models of pro-environmental attitudes (or behaviour) only exist at the individual level. Moreover, they are not dynamic - existing models do not provide the ability to predict how levels of pro-environmental attitudes will change over time (see for example Whitmarsh, 2011).

Students of history would be forgiven for believing that societal change comes in quantum leaps. There are several plausible mechanisms which could account for this (see for example Holt and Barkemeyer, 2012; Quental, Lourenco and Da Silva, 2011) but if we are headed towards a model of societal pro-environmental attitudes then we should at least suspect that the *rate of change* (or first difference) of societal pro-environmental attitudes of being a significant causal factor.

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<sup>1</sup> Consider for example two people, one who regularly recycles waste and campaigns on green issues, but drives a car and has yearly foreign holidays, and someone else, who is no activist, but lives on her own and walks everywhere she needs to go. The first will score higher on *intent*-based methods and the second will do better with *impact*-based measurement.

Progress towards a dynamic model of societal pro-environmental attitudes will require the following:

- A an exploration of the influence over time of environmental knowledge on pro-environmental attitudes
- B an exploration of the influence over time of Fake News on pro-environmental attitudes
- C an investigation of potential models of societal pro-environmental attitudes, using a discrete choice framework to model the diffusion of social norms.

Item C is the topic of an ongoing PhD programme, funded by the Economic and Social Research Council. Item B is the objective of the larger study, to be undertaken between March and August 2020. Item A is the goal of the research described in this report. The learning from A will inform the research design of B. Items B and C could ultimately be combined.

## **Research Question**

With this overall vision in mind, this particular project addresses the simplest part of the question: What effect does environmental knowledge have on individual pro-environmental attitudes, and how does this change over time?

This work will be used as a pilot for the larger study, which will introduce Fake News and compare the net effect of environmental knowledge and Fake News when combined.

The study will select a small group of Bath university students, set them a group task, and test their objective and subjective knowledge at various points.

## Literature Review

There are many different psychological models of pro-environmental attitudes and behaviours, and yet (as stated above) the meta-analysis by Bamberg and Moser (2007) found only weak ability to make predictions. Probably the most widely used models are the Theory of Predictable Behaviour (TPB) (Ajzen, 1985; 1991), Norm Activation Model (NAM) (De Groot and Steg, 2009) and Value-Belief-Norm (VBN) theory (Stern, 2000).

In the TPB model, attitudes inform intentions, which may then lead to behaviours. Both stages are affected by “perceived behavioural control” (PBC). Subjective norms also influence intention. See Figure 1 below.

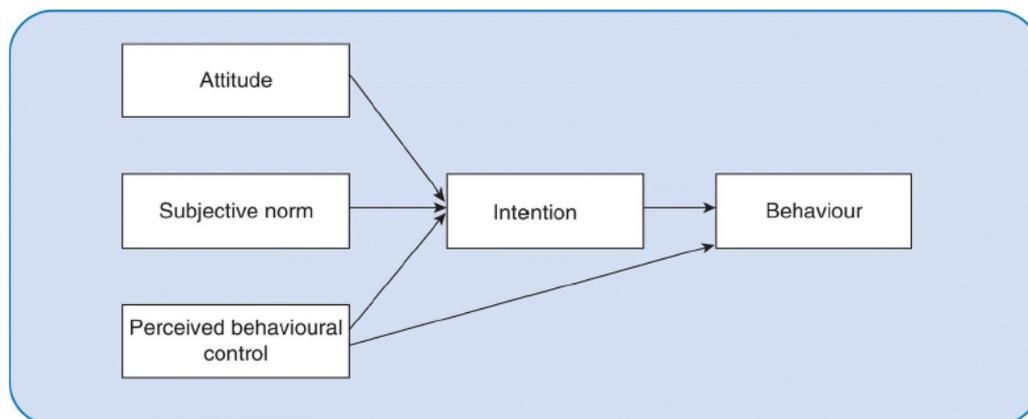


Figure 1: The Theory of Planned Behaviour. Source: Bell, P.A. et al., 1996. *Environmental Psychology*. Harcourt

In the NAM model, personal norms lead to pro-environmental behaviour, but are moderated by “awareness of consequences” and whether the individual feels responsible for the outcome (“ascription of responsibility”). Bierhoff fits environmental knowledge into the model by allowing it to create personal norms (Bierhoff, 2005). See Figure 2 on page 7.

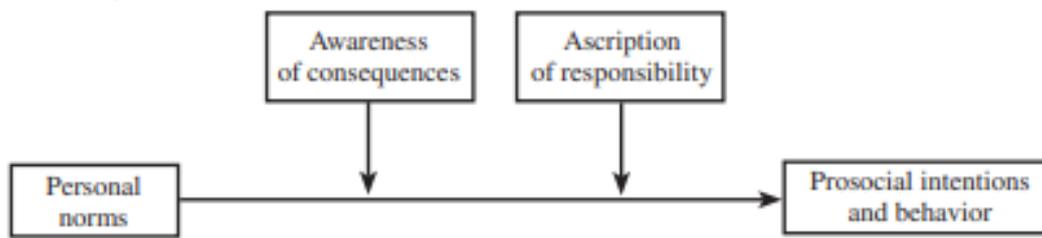


Figure 2: The Norm Activation Model. Source: Adapted from De Groot, J.I.M. and Steg, L., 2009. Morality and prosocial behavior: the role of awareness, responsibility, and norms in the norm activation model. *The Journal of social psychology*, 149(4), pp.425–449

Stern took NAM theory and extended it. In VBN theory (Stern, 2000), values create “ecological worldviews.” Personal norms then act as a filter on the beliefs, determining whether the individual feels a “sense of obligation to take pre-environmental action” (see Figure 3 below). Stern found that it was important to break pro-environmental behaviour down into three categories<sup>2</sup> and that different combinations of causal factors determined each type.

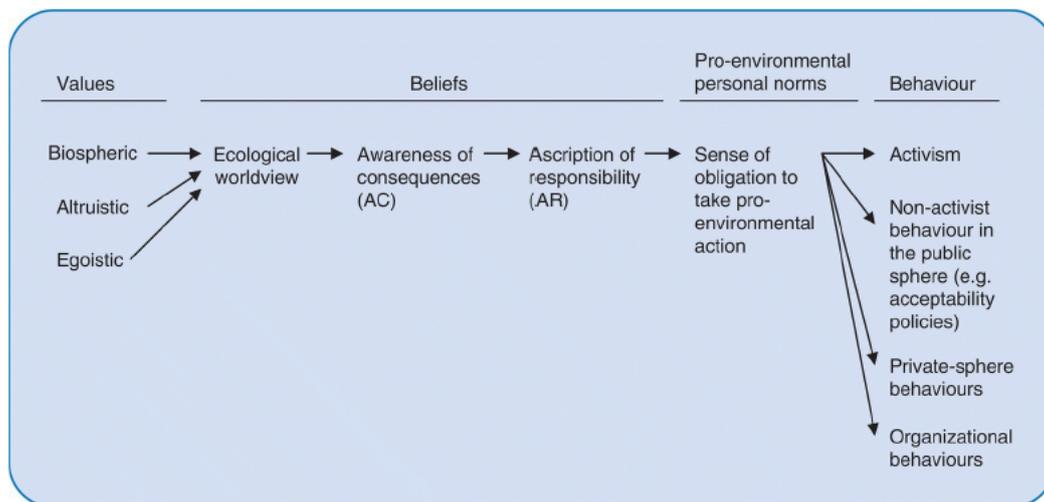


Figure 3: The Value Belief Norm Theory. Source: Bell, P.A. et al., 1996. *Environmental Psychology*. Harcourt

<sup>2</sup> *Environmental Activism, Nonactivist Behaviours in the Public Sphere and Private-Sphere Environmentalism.*

Other models exist (see for example Blake, 1999; Fietkau and Kessel, 1981; Grob, 1995; Hines, Hungerford and Tomera, 1987; Kollmuss and Agyeman, 2002; Lindenberg and Steg, 2013; Rogers, 1983) but are less widely used.

Diekmann and Preisendörfer (2003) found that the “cost” of the environmental action has a strong determining factor in the resultant degree of pro-environmental behaviour, and Holland, Verplanken and Van Knippenberg (2002) established that the strength of pro-environmental attitudes was also decisive (Holland, Verplanken and Van Knippenberg, 2002). It is for these reasons that participants will be asked to self-assess their pro-environmental attitudes on a scale of 0 to 10 in this study, and that the definition of pro-environmental attitudes that will be used will be *intent*-based.

Much work has been done in recent years on the factors preventing individuals from taking environmental actions. Gifford (2011) identified seven “dragons of inaction<sup>3</sup>,” or psychological barriers limiting climate change mitigation. See also Kollmuss and Agyeman, 2002; Marshall, 2015.

It is only comparatively recently that the importance of social norms in determining actions has become clear. Building on the work of Ostrom (2000), Cialdini and Goldstein (2004) and Bicchieri (2006), Nolan et al. were able to show that social norms were highly predictive of pro-environmental behaviour, even though the participants rated them as the least important motivating factor (Nolan et al., 2008). Many subsequent studies (for example, Agovino, Cerciello and Musella, 2019; Hinvest, Fairchild and Elkholy, 2018; Viscusi,

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<sup>3</sup> Limited Cognition, Ideologies, Social Comparisons, Sunk Costs, Discredence, Perceived Risks and Limited Behavior

Huber and J. Bell, 2011) have confirmed the effect, which works because social norms diffuse through a population via what Peyton Young has labelled “social influence” (2009).

While there have been many studies documenting how specific attitudes or behaviours have changed over time (for example, Bronfman et al., 2015; Chakraborty, Singh and Roy, 2017; Chen, 2015; Hamilton et al., 2015; Suganthi, 2019; Vicente-Molina, Fernández-Sáinz and Izagirre-Olaizola, 2013; Whitmarsh, 2011), we are still waiting for a model predicting how pro-environmental attitudes might be expected to change over time.

## **Design**

This section describes the research design of just the pilot study. The larger research project, in which Fake News is included, is not part of this study.

### **Research Design Plan**

A small group of participants will be selected for a group work activity. The purpose of this research project is to gain experience on how to guide and control the group activity, so it is not necessary to make this a large group. As few as six individuals will be sufficient, this being the planned size of groups in the subsequent study.

The group will be given an initial briefing, including a presentation on a recent environmental disaster (the 2019/2020 bushfires in Australia) and will then be given a survey to test both their objective and subjective knowledge of the subject, and to assess their current pro-environmental attitudes.

The group work activity will be to produce a short plan for how to increase pro-environmental attitudes in a population of their choosing.

This survey will be repeated once a week for the duration of the study, which will run for four weeks, producing five sets of survey results. It will ask for their self-assessment of their environmental knowledge. It will then ask them a series of multiple choice questions on the environment to assess their objective knowledge. Lastly, they will be asked to assess their willingness to

undertake costly actions if they will benefit protection of the environment (pro-environmental attitudes).

Throughout the study, the participants' interactions (in the WhatsApp group) will be observed, to better understand the motivations and issues driving the cooperation during the work activity.

## **Tools**

In the larger study the students will be on their summer break, so, while not so critical for the pilot, it is important to choose tools which will be accessible to the participants when they are not on campus.

For that reason, the test subjects will be invited to use (or install) WhatsApp on a device that they have regular access to, and will be invited to join a WhatsApp group. WhatsApp is a very widely-used group communication tool and most participants will be familiar with its use. The nature of the use of the tool (group work) means that if participants do have questions or problems relating to the tool itself, it is highly likely that their team members will be able to provide direct help. In addition to the other test subjects, a moderator will also be included in the group.

Once a week, messages will be sent to the WhatsApp group, reminding the subjects of their group work and asking them to complete the week's survey.

The survey is simple enough that it can be built and delivered using Survey-Monkey. This has the advantage of being accessible irrespective of the location of the participants.

## **Methods to Analyse Data**

The data gathered will consist of the following. For each participant, and each week:

1. An indication (yes/no) of whether they participated that week
2. Their assessment of their subjective knowledge
3. Their score on the objective knowledge questions
4. Their self-assessed pro-environmental attitudes level (scale of 0 to 10)

The main purpose of this work is to act as a pilot for a larger study. The larger study will have multiple groups, and the addition of Fake News during the course of the study. A key concern is how to ensure that the group work progresses well in each group, with (as far as possible) the same information supplied to each group. It is likely that the groups will have unexpected questions, for example, or might make false assumptions. The objective of the pilot is to trial the process and learn what additional information or changes to the protocol would be beneficial.

## **Strengths and Limitations of Approach**

The objective here is to do a small scale pilot to learn how test participants react to study of pro-environmental attitudes and use that knowledge to build a better design for the larger research project in March to August 2020.

Although data will be gathered, the analysis of how pro-environmental attitudes change in a small group over a short period of time is less useful than the learning to be gathered on how groups like this can be expected to behave.

Gathering data on pro-environmental attitudes is not straightforward, for the reasons given above. Research designed to accurately capture pro-environmental attitudes can tend to result in lengthy questionnaires, which poses a practicality problem if the goal is to collect panel data and maintain participant engagement throughout.

The approach taken here is to observe group behaviours in a basic pilot, using a very simplistic survey to capture pro-environmental attitudes and to use these observations to design a more robust larger study.

Another limitation of this project is the condensed timescale (see Timetable, below). Because the larger project will have to start before the students break up (and ideally well before their exams), this shorter study will have to have produced results before that point.

## **Ethical Issues and Resolutions**

In this study, participants will be given information relating to a recent environmental disaster (the Australian bushfires of 2019/2020), be asked to produce a short piece of group work and answer a short survey five times. As the test participants will not be vulnerable adults, and the data collected is not particularly sensitive, there are no special ethical concerns over and above the standard issues with protecting the security of the data, ensuring that participants are made aware that they can withdraw from the study at any time, and so on.

The larger study will introduce two additional changes. Firstly, the number of groups studied will increase (from one to around a dozen). This will permit more robust data analysis and it will also introduce an element of rivalry into the group work, as groups will be competing for the best submission.

Secondly, Fake News will be introduced into the process. This is deliberately feeding participants incorrect information and a number of measures will have to be taken to minimise the ethical concerns.

1. Participants must be informed up-front that they may be given information whose veracity has not been ascertained.
2. The Fake News itself will be chosen to have as little potential negative impact to the lives of Bath university students as possible.
3. Participants must be informed after the trial that they were fed Fake News, and given a corrected version of the information. They must then

be asked to confirm that they understand, and accept that the previous information was in fact Fake News.

The ethics approval form for this larger project will be submitted by the end of January 2020.

## **Timetable**

The following is an expected timeline for this project and the larger study:

Time	Activity
Jan	ethics form (EIRA1) submission
Jan	recruitment of pilot participants
Feb	operation of pilot study
Mar	completion and write-up of study
Mar	ethics approval obtained
Mar - Apr	recruitment and setup of larger study
Mar - Jul	operation of larger study
Aug	write-up of study

## **Conclusion**

Although a very short project, this study is important in that it will help inform the design of the larger study, and that study will collect panel data information on the diffusion of environmental knowledge, which is needed to help produce a model of societal pro-environmental attitudes.

## **Practical Aspects**

Typically a pilot study has as many aspects in common with the later study as possible. In order to collect useful data (from the larger study) it will be important to ensure that test subjects complete the group work. This will be easier to achieve if the test subjects already have a relatively high level of pro-environmental attitudes. For this reason, recruitment of participants will be targeted at members of the university “People and Planet” group.

## **Integrity and Rigour**

The larger study will involve working with a dozen or so competing groups of participants. In order to make comparisons between the groups (and amalgamation of results) possible, it is important to standardise as much of the test protocol as possible. This means that groups should all be given the same information, in the same way, and that differences should be minimised.

There are however, very many ways in which the groups will naturally differ. They will be composed of different individuals, and there will be differing social interactions within each group. In practice it is next to impossible to ensure the same kind of rigour with human participants as it would be when setting up a computer simulation. This is even more the case when dealing with groups of individuals.

For this reason, the research design and research question have been deliberately simplified and the amount of data gathered will be kept as small as is possible while still consistent with meeting the research objectives.

## **Expected Results**

It is known from previous research that higher levels of environmental knowledge can under certain circumstances lead to higher levels of pro-environmental attitudes. Whether the level of pro-environmental attitudes increases or reduces over time depends on many factors which this small project is not studying (for instance, the social dynamic in a pro-environmentally-aware group could lead to increased levels of pro-environmental attitudes, or other factors, such as subject fatigue could result in a reduction of levels).

What should become clear though is what social factors affect participation and completion of the project.

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