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"Little green lies": Exploring compensatory beliefs within the environmental domain

By:

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Abstract

While mounting environmental issues (e.g., climate change) mean that there is an increasing urgency for behavioural change this can be difficult to achieve. This thesis applied learning from health psychology to the issue of why pro-environmental intentions do not necessarily translate into action. Research had found that people working towards health goals were not succeeding or were making slow progress because they employed compensatory beliefs to justify succumbing to desires that conflicted with their health goals. A compensatory belief is the belief that the negative consequences of one action can be compensated for by another action.

This research investigated whether, when, why and how compensatory beliefs may be used in relation to environmental behaviours. This research began with exploratory qualitative work using cognitive and semi-structured interviews. These findings were then followed up by experimental work. Study 2 found that participants who reflected on their negative environmental behaviours expressed significantly stronger (compensatory) intentions to be pro-environmental than participants who reflected on their positive environmental behaviours. Studies 3-5 explored the influence of behavioural history on compensation and licensing across a series of scenarios using vignettes. Evidence was found that participants balanced environmental (or pro-social) interests with self-interest. Study 6 looked at the effects of goal saliency and construal on compensatory behaviours, finding that, participants who inferred good progress were more motivated to be pro-environmental. Overall, the research provides some evidence (albeit equivocal) of compensation and licensing in relation to environmental behaviours. The findings as a whole suggest that prompting feelings of environmental guilt is not an advisable strategy to engage people in pro-environmental behaviour. In contrast, prompting people to reflect on their existing pro-environmental behaviours or to imagine how they would feel after engaging in environmental action does motivate environmental action.

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Thesis Introduction

The present thesis is concerned with how people resolve dilemmas that arise when their goals (e.g., to be pro-environmental) conflict with their more immediate desires (e.g., to take the car, rather than cycle). Specifically, this thesis investigated whether people use compensatory beliefs to justify acting counter to their pro-environmental goals. A compensatory belief is the belief that the negative consequences of one action can be compensated for by another action.

Study 1 used exploratory qualitative methods to investigate whether, when, why and how compensation is used in relation to environmental behaviours. It was found that participants used compensatory beliefs: 1) in order to reduce feelings of guilt with respect to their (assumed or actual) negative environmental impacts, and; 2) to defend their green credentials in social situations. Whether participants considered the use of compensatory beliefs to be acceptable depended on moral and social norms and the personal cost of the behaviour. Furthermore, the results suggested that the relatively low endorsement of compensatory beliefs found by a previous survey study (Kaklamanou, Jones, Webb, & Walker, 2015) could at least in part be attributed to differences between the way in which participants expressed compensatory beliefs and the way in which they were phrased in the measure.

Based on these findings and the extant literature, Study 2 predicted that people who reflected on their negative environmental behaviours would feel motivated to compensate, while people who reflected on their positive environmental behaviours would feel licensed to undertake negative (i.e., desirable but environmentally detrimental) behaviours. Participants provided a written reflection on their environmentally significant behaviours after which they were offered the opportunity to: 1) indicate their intentions to be pro-environmental in future, and 2) volunteer for an environmental charity. The analyses found that participants in the guilt condition reported significantly stronger (compensatory) intentions than other participants. However, no significant differences between conditions were found with respect to willingness to volunteer.

Research into moral balancing suggests that engaging in an ethical or unethical behaviour at one point in time reduces the likelihood of subsequently engaging in that

behaviour. For example, having just recycled someone may be less likely to also conserve water. Studies 3 to 5 used a novel experimental paradigm based on the work of Zhong, Ku, Lount, and Murnigham (2010). Vignettes were developed to explore compensating and licensing effects across different environmental scenarios. It was hypothesised that a "flip-flopping" pattern would emerge if participants indeed alternated between more and less pro-environmental decisions. After controlling for the extent of participants' green identities this pattern was identified in Study 3.

Because Study 3 was quasi experimental (i.e., participants were divided into conditions based on their response to the first scenario), Study 4 manipulated participants' first choice by asking them to imagine recycling or failing to do so. It was hypothesised that participants' subsequent choice would contrast with their first choice. However, no significant association between the first (imagined) choice and subsequent choice was found. Study 5 investigated whether the nature of the scenarios influenced whether and to what extent compensating and licensing would be seen. The data, however, did not support this hypothesis and neither Study 4 nor 5 replicated the "flip-flopping" pattern found in Study 3.

Study 6 investigated the effects of perceived progress toward goals on licensing and compensation. Research by Fishbach, Dhar, and Zhang (2006) led to a number of predictions including that compensation would be found among participants for whom non-environmental goals were salient and who inferred that they were making poor progress towards environmental goals. Unfortunately, it appeared that the manipulation of goal saliency was overridden by the progress manipulation (list 3 or 12 pro-environmental behaviours) making environmental goals salient for all participants. This made it difficult to test a number of hypotheses. Nonetheless, Study 6 found that participants who inferred that they were making good progress (and presumably, for whom, the environment had been made salient by reflecting on their pro-environmental behaviours) did not show licensing effects but rather expressed significantly stronger intentions to be pro-environmental in future (positive spillover effect).

Overall, the research described in this thesis provides some evidence (albeit equivocal) of compensation and licensing in relation to environmental behaviours. Compensatory justifications were elicited by asking participants to reflect on how their behaviours had harmed the environment (Studies 1 and 2). Furthermore, evidence of "flip-flopping" effects were found in Study 3. In line with the wider literature it appears that

compensatory beliefs are associated with feelings of guilt. The findings as a whole suggest that prompting feelings of environmental guilt is not an advisable strategy to engage people in pro-environmental behaviour. While guilt may prompt a reparative action it can also prompt compensatory beliefs and justifications which may be inaccurate or not translated into action – thereby, increasing risk to the environment. The studies do, however, suggest that prompting people to reflect on their existing pro-environmental behaviours or to imagine how they would feel after engaging in environmental action motivates environmental goals. Therefore, this may be a more fruitful avenue for intervention than prompting people to feel guilty about their environmentally damaging behaviour.

1. Chapter 1 – Setting the scene: can insights from health psychology help to inform environmental psychology?

This chapter will broadly set out the context of this thesis research. First, the chapter will provide the reader with a basic overview of why the environment is an important area for research and, more specifically, why the interplay between humans and the environment is an important area for psychological research. It will be argued that psychology not only provides insights into why humans cause harm to the environment but can also help to better understand the drivers and barriers to engagement in pro-environmental behaviours. The second part of the chapter will focus on why people engage in some pro-environmental behaviours but not others. In short, the question of why people are inconsistently pro-environmental will be addressed.

Finally, the chapter will focus on "compensatory beliefs" – a form of justification for engaging in ostensibly harmful behaviours that has been identified within health psychology. The question will be posed as to whether insights into compensatory beliefs from health psychology could usefully be employed within environmental psychology to better understand why there is a gap between the environmental values and intentions expressed by people and how they actually behave. Following on from this existing research on 'compensatory green beliefs' – namely the "idea that the positive consequences of proenvironmental behaviors (e.g., switching to a "green" energy tariff) can somehow compensate for the negative consequences of energy-inefficient or unsustainable behaviors" (or vice versa) will be explored in some detail (Kaklamanou, Jones, Webb, & Walker, 2015, p. 3).

1.1. Environmental challenges and the need for behavioural change

Human demands for resources are resulting in serious and negative environmental impacts including deforestation, pollution and climate change (IPCC, 2014). There is serious concern for the future survival of many animal and plant species. Furthermore, changing global temperatures also pose a threat to people, particularly, those living in poverty who are less equipped to adapt to a changing climate (for example see IUCN, 2013; Renton, 2009). Because of the scale of the climate change problem international action is required to keep warming below two degrees Celsius – a temperature ceiling

that is taken to offer hope of avoiding the most serious impacts of climate change (European Commission, 2014).[1] Within Europe, for example, the European Commission has undertaken a number of initiatives to limit carbon dioxide (CO_2) emissions and promote electricity from renewable sources (e.g., solar power) (European Commission, 2014). Both Member States and the European Community are acting to reduce greenhouse gas (GHG) emissions as required by the Kyoto Protocol.[2] Within the UK the government has set ambitious targets for the national reduction of GHGs, including a 34% reduction by 2020 and an 80% reduction by 2050 (compared to 1990 levels) (2008 Climate Change Act).

In order to effectively reduce greenhouse gas (GHG) emissions action is required at all levels of society – from global corporations to individual citizens. Lifestyle choices, particularly, within more economically developed countries are increasingly resource intensive. For example, it has been estimated that the ecological footprint per person in the UK is 5.4 global hectares. To put this into perspective – if people globally were to live like people in the UK then three planets would be required to support the demands made by their lifestyles (WWF, 2006).[3] In terms of per capita ecological footprint (i.e., the number of global hectares demanded per person), Kuwait, Qatar and the United Arab Emirates are in the top three – being the most resource intensive countries. In contrast countries such as Ethiopia, Kenya, Bangladesh and Timor-Leste are actually below the World average bio-capacity (i.e., consuming less than a 'one-earth' share of resources) (WWF, 2015).

The resource and energy demands resulting from lifestyles are wide ranging. Within the UK, for example, the domestic sector has grown to become the largest electricity consumer (113.5 TWh) (DECC, 2014). Furthermore, without intervention this high

[1] Plans to achieve a two degree temperature ceiling were drawn up at the Cancun Agreements in 2010 and further fleshed out in Durban in 2011. For further details please see: http://unfccc.int/key_steps/cancun_agreements/items/6132.php

[2] The Kyoto Protocol is an international agreement associated with the United Nations Framework Convention on Climate Change which commits its Parties to internationally binding carbon reduction targets. The Kyoto Protocol was adopted in Kyoto, Japan in 1997 and entered into force in 2005. For further information please refer to the online resources provided by the United Nations: http://unfccc.int/kyoto_protocol/items/2830.php

[3] For over 40 years human demands on natural resources have exceeded the capacity of the planet to replenish resources and absorb waste. For further information about ecological footprints and how these vary by country please see: http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/ecological_footprint/ More detailed information concerning the ecological footprint of the UK can be found at: http://assets.wwf.org.uk/downloads/counting_consumption.pdf

demand is likely to continue because of technological developments, economic growth and demographic and institutional factors (Abrahamse, Steg, Vlek, & Rothengatter, 2005, p. 274; Faiers, Cook, & Neame, 2007). Within the UK final and direct domestic energy use includes: space heating (58%); water heating (24%); lighting and appliances (18%) (Adam Faiers et al., 2007). Domestic travel accounted for 25% of UK CO_2 emissions (Committee on Climate Change, 2014). However, this is still not the complete picture. Direct energy use (e.g. gas, electric and motor fuel) actually only accounts for around 50% of the total energy demanded by consumers. Significant energy use and associated GHG emissions are also being generated by indirect energy use such as the embodied energy required to manufacture, transport, distribute and dispose of the goods demanded by the public (Kok, Benders, & Moll, 2006; Steg & Vlek, 2009). Considering these facts it is perhaps unsurprising that one of the main conclusions reached at the Rio Earth Summit[4] in 1992 was that "altering consumption patterns is one of humanity's greatest challenges in the quest for environmentally sound and sustainable development" (Sitarz, 1994, p. 39 as quoted by Thogersen, 1999).

While scientific understanding of environmental issues is rapidly advancing, actual behavioural change has been slow to follow, with interventions designed to encourage better environmental behaviours, often having mixed results (Abrahamse & Steg, 2013). The impetus, therefore, for those working to manage and reduce carbon emissions (e.g., policy makers, corporations etc.) is on how to better understand and promote pro-environmental behaviours. Pro-environmental behaviours are defined as behaviours which seek to minimise the negative effects of our actions on the natural and built environments (see, Kollmuss & Agyeman, 2002, p. 240) or which benefit the environment in some way (e.g., tree planting) (Steg & Vlek, 2009). As outlined previously, the energy and resource demands of individuals are not just direct (e.g., in terms of gas or motor fuel) but also indirect (e.g., in terms of the embodied energy to manufacture and dispose of goods). In order, therefore, to reduce both direct and

[4] The United Nations Conference on Environment and Development (UNCED) informally known as The Earth Summit took place in Rio de Janeiro in 1992, twenty years after the first global environment conference (UN Conference on the Human Environment, 1972). The aim of the Earth Summit was to re-think economic development in order to take into account impacts on the environment. The Summit lead to the adoption of Agenda 21 – a programme for global action for more sustainable development which included proposals to address poverty and better manage agriculture and oceans. The Rio Declaration was also made at the Summit. This Declaration on Environment and Development constituted a series of principles outlining the rights and responsibilities of States. For further information see: http://www.un.org/geninfo/bp/envirp2.html

indirect carbon emissions and other GHGs associated with individual's lifestyles it will be necessary to address a wide range of behaviours.

The remainder of this chapter will focus on providing an overview of some of the main theories about human engagement in pro-environmental behaviours and also on why it is that people may be (in)consistently pro-environmental.

1.2. Understanding engagement in pro-environmental behaviours

In order to effectively promote the adoption and sustained undertaking of pro-environmental behaviours, it is advantageous to have a good understanding both of why people choose to engage in pro-environmental behaviours and of the factors which may promote or prevent behavioural change. A large number of theories from a variety of disciplines have been developed in order to address this question but no definitive answers have been reached (Kollmuss & Agyeman, 2002). Nonetheless, while it is true that no one theory is able to provide a complete picture, each provides a lens through which to better understand engagement in pro-environmental behaviours. Because research on the psycho-social determinants of pro-environmental behaviour is, in fact, so extensive only a few of the main works from psychology can be discussed here. The reader is, therefore, directed to refer to other sources for a more detailed overview of this field such as: Hines, Hungerford, and Tomera (1987), Bamberg and Möser (2007) and Kollmuss and Agyeman (2002).

In explaining pro-environmental behaviour, theoretical models developed within psychology have tended to place emphasis either on self-interest and rational choice or alternatively on pro-social theories. Researchers who view pro-environmental behaviour as being primarily pro-socially motivated frequently refer to Schwartz's 1977 'Norm Activation Model' (NAM) or the Value-Belief-Norm model (an extension of the NAM) (Stern, 2000; Stern, Dietz, Guagnano, & Kalof, 1999). In contrast researchers who view self-interest (or 'rational choice') as the primary motivator of pro-environmental behaviour may favour the 'Theory of Planned Behaviour' developed by Ajzen (1991) (for further discussion see: Bamberg & Möser, 2007). This trend has, however, begun to change as a number of researchers have worked to integrate rational and value-based accounts of pro-environmental behaviour (for example, Bamberg & Möser, 2007; Haarland, Staats, & Wilke, 1999; Kaiser, Hübner, & Bogner, 2005). Bamberg and Möser (2007), for instance, argue that pro-environmental behaviour is best understood

as a combination of self-interest (e.g. conserving energy in order to save money) and concern for others including, for example, future generations or other species. The following sections will map out these trends within psychological research showing how theories used to explain pro-environmental behaviours have been developed and refined. It will be argued that because of the complexity of pro-environmental behaviour models which incorporate rational models and self-interest along with pro-social models (which emphasise norms and values) may best explain behaviour.

The following theories will be discussed:

- Rational Choice
    - The Theory of Reasoned Action (TRA)
    - The Theory of Planned Behaviour (TPB)
    - The Model of Responsible Environmental Behaviour
- Prosocial models
    - The Norm Activation Model (NAM)
    - The Value-Belief-Norm Model (VBN)
- Integrative Models (combining rational and pro-social factors)

1.2.1. Review of rational choice models

The *Theory of Reasoned Action* (TRA) (Ajzen & Fishbein, 1977, 1980) has three main premises which are as follows: 1) the TRA is concerned with predicting *reasoned* behaviour (by which it is meant that individuals are aware of the consequences of their behaviour and deliberately chose to perform the behaviour); 2) that the behaviour is volitional (i.e., the individual acts freely); 3) that the theory is "sufficient" – meaning that all relevant variables for behaviour are incorporated in or mediated by the variables included in the model (Staats, 2003). The TRA is comprised of four main concepts namely, attitude, subjective norm, behavioural intention and behaviour.

The TRA proposes that an attitude to a behaviour is caused by beliefs about behavioural outcomes and weighted by an evaluation of those behavioural outcomes. For example, someone might want to go and volunteer to plant trees for an environmental charity. Volunteering will give the person exercise and the opportunity to meet new people but it will also take up all of their Saturday meaning that they cannot help their housemate clean the house. Considering the likelihood of getting exercise and making friends (both

very positive prospective outcomes) the person may decide that the cleaning can be postponed until Sunday. In addition to behavioural outcomes, subjective norms are also seen to play an important role in determining behaviour. Behavioural norms are composed of normative beliefs and the motivation to comply. To use the same example, the person may take into consideration: a) whether their housemate would approve of them going out all Saturday to plant trees rather than helping with housework, and b) the extent to which their housemates' opinion actually matters. Behavioural intentions, themselves, are seen to be the antecedents of behaviour founded on attitudes and subjective norms (Ajzen & Fishbein, 1977, 1980; Fishbein, 1980; Madden, Scholder, & Ajzen, 1992).

Ajzen and Fishbein precisely defined how the TRA should be applied (see Ajzen & Fishbein, 1977, 1980). In short, they prescribed that the model should be applied very specifically in order to achieve a high correspondence between action, target, context and time (Staats, 2003). For example, if one was to investigate recycling using the TRA then all concepts in the theory should be specifically about recycling (i.e., intention to recycle, attitude towards recycling etc.). Accuracy of prediction is also enhanced by shortening the lapse of time between intention formation and action (the greater the gap and the less likely it is that the person will act) and by assessing the extent to which an individual has volitional control over the behaviour (Madden et al., 1992).

The *Theory of Planned Behaviour*: Ajzen (1985) builds on the Theory of Reasoned Action by including the premise of volitional control (Staats, 2003). In short, whether someone intends to act pro-environmentally and actually does so is not only dependent on their attitude to the behaviour (e.g., whether they view recycling positively) and by subjective norms relating to the behaviour (e.g., beliefs about whether important others approve of recycling and whether recycling is deemed to be easy) but also by whether the person feels they have the necessary resources and opportunities to act (Madden et al., 1992).

Perceived behavioural control is seen to operate in three main ways (see Figure 1 below). First, when considering a behaviour (e.g., trying to break a world record) a person is likely to take into account whether the behaviour is achievable. If the behaviour is deemed unachievable (e.g., the person lacks the resources or physical capacity to break the world record) it is assumed that an intention will not be formed. Perceived behavioural control is, therefore, not only seen to interact with intentions

(dashed line 2) but also to directly relate to behaviour (dashed line 1) (Staats, 2003). Second, it should be noted that actual control may not be equal to perceived control leading to inaction. For example, a person might intend to recycle but once they discover that the recycling facilities involve a long walk they may decide that they are unable to act after all. Thirdly, therefore, perceived behavioural control is important. Someone might realise that in order to perform a complex behaviour (e.g., learning a new language) that they will need to invest a significant amount of time, money and effort over the course of many months. If the person does not feel that they can invest the necessary resources in this exercise they may not act on their intention. In short, the inclusion of perceived behavioural control has been seen to significantly improve both the prediction of intention and actual pro-environmental behaviour (Madden et al., 1992) meaning that the TPB is now more widely used than the TRA (Staats, 2003).

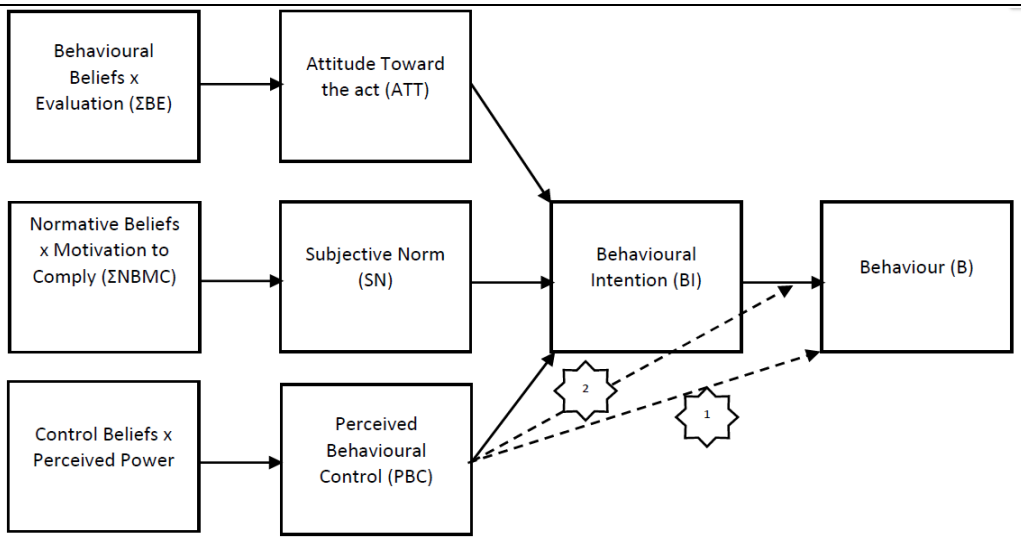


Figure 1: The Theory of Planned Behaviour as set out by Ajzen (1991)

It should be noted that both the TRA and the TPB place a strong emphasis on the individual costs and benefits of acting pro-environmentally. Whether someone acts pro-environmentally or otherwise is seen to be the result of a calculation of the extent to which acting would be personally beneficial (e.g., whether one would enjoy recycling or whether one would gain social approval by recycling). The TPB assumes that other factors such as values, habits or demographics influence behaviour only indirectly via attitudes, subjective norms and perceived behavioural control. While the TPB has been used to explain various types of behaviour (e.g., car use), studies have found that the predictive power of the TPB is increased when other motivational predictors are also included (Steg, Van den Berg, & De Groot, 2013). Haarland et al. (1999), for instance,

found that the addition of personal norms[5] increased the proportion of explained variance. This shows that while the TPB helps us to better understand and predict pro-environmental behaviour other factors are also likely to be responsible for influencing the complex and diverse set of behaviours described as being "pro-environmental".

The *Theory of Planned Behaviour* has been further developed by a number of other researchers with the aim of better explaining the determinants of pro-environmental behaviour. For example, Hines et al. (1987) developed their *Model of Responsible Environmental Behaviour* using the TPB (see discussion by Kollmuss & Agyeman, 2002). Hines and colleagues conducted an in-depth meta-analysis of 128 empirical studies focusing on environmental behaviours. The majority of the reviewed studies focused on the relationship between pro-environmental behaviour and socio-structural variables, while a limited number considered the relationship between psycho-social variables including attitude, locus of control and moral responsibility (Bamberg & Möser, 2007). The research enabled Hines and colleagues to develop a more sophisticated model to determine which variables may have the greatest influence in motivating pro-environmental behaviours. The following variables were found to be of particular importance (see Hines et al., 1987; Kollmuss & Agyeman, 2002, p. 243):

- **Knowledge:** in order to respond to an issue people need to be conversant with the causes and equipped with the knowledge of how to respond appropriately.
- **Locus of control:** people need to feel that they can bring about the required change in order to be motivated to act.
- **Attitudes:** people with pro-environmental attitudes are more likely to engage in pro-environmental behaviours.
- **Verbal commitments:** once someone has publically expressed a willingness to undertake an action, they are more likely to follow through with the action (e.g., because they feel morally accountable to others).
- **Responsibility:** the more responsible people feel for an environmental issue, the more likely they are to engage in an environmentally responsible behaviour.

Hines and colleagues argue, therefore, that in order to act pro-environmentally people need to be well informed, feel empowered to act and feel that acting is of some value.

[5] "Personal norms" refer to an individual's beliefs about their moral obligation to take pro-environmental action (Steg et al., 2013; Stern, 2000).

Being aware of the environmental impacts of behaviours may help motivate individuals to take responsibility for their actions, while making a public commitment to do so may help to promote feelings of accountability.

1.2.2. Altruism, empathy, and prosocial models

Altruism, empathy and pro-social[6] models provide another framework by which to understand engagement in pro-environmental behaviours. In the models discussed above, individuals were seen to act rationally in line with assessments about the most personally beneficial course of action. Short term rational decisions which benefit the individual, however, (e.g., driving rather than using public transport because it's more convenient) present a social dilemma to the extent that the behaviour may come at the expense of others (e.g., contributing to air pollution). However, what these models largely neglect is the fact that people do engage in pro-environmental behaviours despite their personal cost (Haarland et al., 1999). For example, someone might abstain from air travel or from eating meat in order to reduce their carbon emissions or they might invest time in sorting waste for recycling in order to reduce landfill. Such actions can be described as pro-social or altruistic because they are of benefit to society at large rather than to the individual (Lindenberg & Steg, 2013; Steg et al., 2013). The extent to which individuals subscribe to altruistic or self-transcendent values (as opposed to egocentric/self-interested values) has been found to be positively associated with their likelihood of engaging in pro-environmental behaviour (Steg & Vlek, 2009; Stern, 2000).

The role of moral obligations in promoting pro-environmental behaviours are explored in the following prosocial theories which are discussed below:

- The Norm Activation Model (NAM)
- The Value-Belief-Norm (VBN) Model

Put simply, the basic premise of the *Norm Activation Model* [7] is that personal or moral norms are the direct determinants of pro-social behaviour. The theory proposes that

[6] Pro-social behaviour is defined here as a voluntary and intentional behaviour that benefits another, the motive for which is unspecified and may be positive or negative (Eisenberg & Miller, 1987).
[7] The Norm Activation Model was proposed by Schwartz (1977) and further developed by Schwartz and Howard (1981) and tested by Steg and De Groot (2010).

personal norms are activated by four variables. The first of these variables is *problem awareness*. Before a person can act on an environmental issue they first need to know that there is an issue (e.g., that there is localised air pollution). Second, the person needs to feel a sense of personal *responsibility* for the problem (e.g., that their driving is contributing to local air pollution). The third variable is *outcome efficacy*, namely the ability to identify an appropriate course of action in response to the problem (e.g., to use the tram rather than driving). Fourth, the person requires *self-efficacy* and recognise that they can do something to help solve the problem.

Like the NAM, the *Value-Belief-Norm* (VBN) theory (Stern, 2000; Stern, Dietz, Guagnano, & Kalof, 1999) also focuses on moral obligations to act pro-environmentally. The VBN theory links a person's ecological worldview[8] and environmental values with the NAM theory outlined briefly above.

Stern et al. (1999) draw together the findings from the wider literature to argue that a number of factors are important determinants of pro-environmental behaviours and more specifically of environmental activism and citizenship, policy support and private sphere behaviours (e.g., conserving energy). Stern at al. (1999) present a causal chain of factors predicting environmentalism which include the following variables:

1. First in the chain is *values.* Three value orientations are seen to be important, namely, biospheric values (altruism towards other species), egoistic values (self-interest) and altruism directed at humans. In an earlier paper, Stern, Dietz, and Kalof (1993) provide some further insights into the role of these three value types on pro-environmental behaviours arguing that all three are present in individuals to varying extents. However, the extent to which any one value predominates within an individual is likely to shape their motivation to engage in environmental behaviours. It should be noted that egoistic values may sometimes motivate pro-environmental behaviour but will only tend to do so when acting pro-environmentally is seen to be in the individuals best interest (e.g., when taking the train rather than the car is perceived to be more relaxing or cost effective).

[8] Ecological worldview is measured by the New Ecological Paradigm (NEP) Scale developed by (Dunlap, Kent, Mertig, & Jones, 2000).

2. Second in the chain come *beliefs*. These beliefs include a persons' ecological worldview, for example, the extent to which they believe that the environment has intrinsic value or to which they believe that human behaviour is causing environmental damage (usually measured by the New Ecological Paradigm Scale scale). Beliefs about the negative consequences of human behaviour on the environment and about an individual's own responsibility for having caused detrimental impacts on the environment are also seen to be important in predicting behaviour.
3. Third in the chain are *personal norms* which have an important role and directly affect how support for the environment is manifested (i.e., as activism, citizenship, policy support or private sphere behaviours).

In this chain of variables each individual variable is seen to strongly relate to the one's to which it is directly attached. The model is illustrated below in Figure 2:

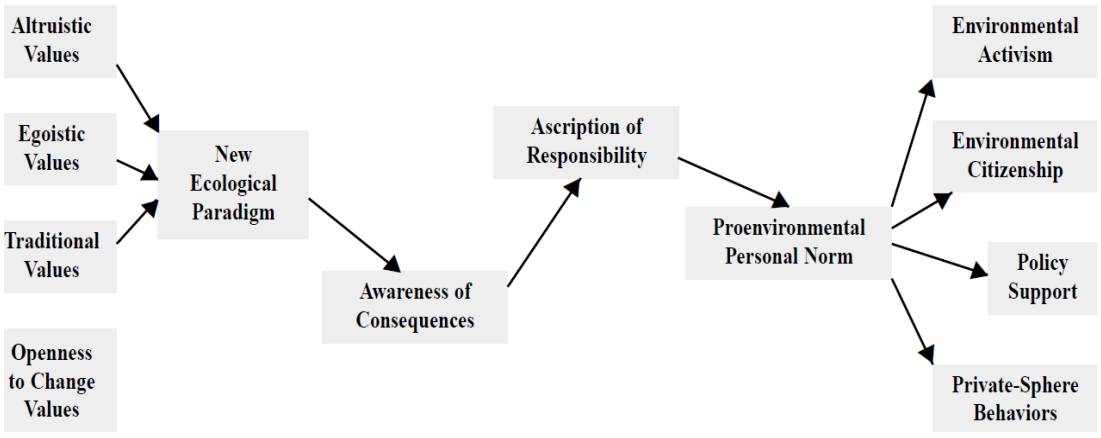


Figure 2: Schematic Model of the variables in the Value-Belief-Norm Model. (Image sourced from Stern et al., 1999, p. 84)

Both the Norm Activation Model and the Value Belief Norm models have been used successfully to explain a range of low cost pro-environmental behaviours including energy conservation (Black, Stern, & Elworth, 1985), reduced car use (Abrahamse, Steg, Gifford, & Vlek, 2009) and also political behaviour (Gärling, Fujii, Gärling, & Jakobsson, 2003). The NAM, however, has been far poorer in explaining engagement in high cost pro-environmental actions (Guagnano, Stern, & Dietz, 1995). In this respect the Theory of Planned Behaviour has been found to be superior in predicting pro-environmental behaviour (Steg & Vlek, 2009)

1.2.3. Integrating rational and pro-social models

A number of researchers have attempted to draw together and integrate the concepts and variables from the different theories explaining pro-environmental behaviour. The first study combining the TPB with personal norms was conducted by Haarland et al. (1999). Haarland and colleagues set out to investigate why attitude appeared to be a stronger predictor of intention than did subjective norms. They hypothesised that personal norms (i.e., internalised values) might lay behind the predictive power of attitude and furthermore that inclusion of personal norms in the model would increase understanding of environmental behaviours. The study included 305 Dutch citizens who had enlisted to participate in a behavioural change study. The reason for having a pro-environmental sample was that people enlisted in a program designed to help them live more pro-environmentally ought to have activated personal norms to perform environmental behaviours (Haarland et al., 1999). The study confirmed that personal norms did in fact increase the proportion of variance explained by the TPB.

Kaiser (2006) also brought rational and pro-social models together by combining the Theory of Planned Behaviour with moral considerations. The results of the cross-sectional survey study involving 1394 German residents was that the inclusion of affect (in this case - anticipated guilt) did uniquely and significantly contribute to the explanatory power of intention increasing the proportion of explained variance to between 70-92% (Kaiser, 2006). It should be noted, however, that even when moral considerations are not explicitly addressed the TPB is still capable of accounting for a large proportion of variance in pro-environmental behaviours and that adding a moral dimension merely slightly increases the model's power (Kaiser, 2006). Evidence shows that there is considerable overlap between attitudes and moral norms meaning that people's attitudes to the environment are determined by their moral and altruistic norms (Kaiser, 2006; Kaiser & Scheuthle, 2003).

Bamberg and Möser (2007) replicated and further developed the work by Hines et al. (1987) (see, *Model of Responsible Environmental Behaviour* discussed above). While Hines et al. (1987) increased the complexity of the TPB by including additional variables, Bamberg and Möser (2007, pp. 243-244) argue that the associations between knowledge and attitudes, attitudes and intentions and intentions and behaviour are still weak. In other words, many more factors seem to influence pro-environmental behaviour. Taking a theory-driven multivariate meta-analytical approach to 57 studies

dated between 1995 and 2006, Bamberg and Möser (2007) estimated the predictive power of various factors in explaining pro-environmental behaviour. The study provided evidence supporting the work of Hines et al. (1987) and confirmed that pro-environmental behavioural intention mediates the impacts of the other psycho-social variables on behaviour (27% of variance explained). Furthermore, the study established that in addition to attitude and behavioural control, moral norms were a predictor of behavioural intention (52% of variance explained). While problem awareness was important, it was found that its effects were indirect – operating via moral and social norms, guilt and attribution processes.

Goal Framing Theory, developed by Lindenberg & Steg (2007), also attempts to integrate different theories about engagement in pro-environmental behaviour. Goal Framing Theory proposes that goals 'frame' the way in which people process and then act upon information. Lindenberg & Steg (2007) propose that there are three goal frames: 1) hedonic goals (e.g., "to feel better now"), 2) gain goals (e.g., "to guard one's resources") and, 3) normative goals (e.g., "to act appropriately"). The theory further proposes that multiple goals may be active at any one time. The currently activated goal is known as the 'goal frame' and this may be strengthened or weakened depending on whether the background goals complement or conflict with the goal frame. It can be seen that the three goal frames correspond with other psychological theories explaining pro-environmental behaviour. For example, models focusing on affect correspond with hedonic goals, the TPB corresponds with gain goals and the NAM and VBN correspond with normative goals (Steg et al., 2013). The theory, therefore, offers an integrative framework for understanding pro-environmental behaviour.

The research briefly outlined above helps to address the possible imbalance in earlier models by showing that both self-interest and pro-social motives have an important role in explaining pro-environmental behaviour. In short, including pro-social and moralistic factors has been found to promote a better understanding of people's engagement in pro-environmental behaviours.

1.2.4. Summary

To summarise, from this brief review of some of the main theories explaining intentional engagement in pro-environmental behaviour it can be seen that engagement is dependent upon complex personal, social and contextual factors. Furthermore, it can

be seen that many of the theories have aspects in common. For example, individual differences such as outlook (e.g., egoistic orientation), knowledge, values and feelings of responsibility along with social (normative beliefs) and contextual factors are likely to combine to influence the extent to which an individual is willing and able to engage in pro-environmental action.

The models of pro-environmental behaviour can be seen to fall into two broad categories, namely, those which are rational-choice-based models such as the Theory of Planned Behaviour and those which include moral norms as a separate predictor of pro-environmental behaviour such as the Value, Belief Norm Model. More recently, research has attempted to combine these two models in order to try and more effectively predict engagement in pro-environmental behaviour. Nonetheless, even models that recognise morals do not account for all variance in behaviour – indeed, people seem to engage in some behaviours but not in others. People may be better informed about the environmental consequences of some behaviours, for example, but not others or may knowingly trade-off one action with another. The reasons for these seemingly inconsistent environmental behaviours are explored in section 1.3 below.

1.3.Behavioural inconsistency

The theoretical frameworks discussed above all attempt to explain the gap between people's environmental awareness, values and attitudes and their actual undertaking of pro-environmental behaviours. In short, these models help to explain why people undertake some behaviours (e.g., recycling) but not others (e.g., cycling) or may engage in environmental behaviours but irregularly (e.g., only when doing so is easy). This is problematic because in order to make significant reductions to the energy and resource intensity of peoples' lifestyles it is essential that a wide range of pro-environmental behaviours are adopted and integrated into people's lifestyles. An important objective for policy makers, therefore, has been to identify the most effective methods and behaviours to promote environmentally sustainable lifestyles:

> We need to promote a range of behaviours as entry points in helping different groups to make their lifestyles more sustainable – including catalytic (or "wedge") behaviours. (DEFRA, 2007, p. 22)

One popular idea has been that of "positive spillover" – the idea that certain behaviours may be carried over from one area of life or activity to another (Austin, Cox, Barnett, & Thomas, 2011). For example, it might be anticipated that introducing a recycling scheme at work might induce employees to also recycle at home. There are a number of theories which lead us to expect 'spillover' effects. Research has shown, for example, that people generally *desire to act consistently* (e.g., Bem, 1967; Festinger, 1957). We would expect, therefore, that someone who has sorted and recycled their waste at work might experience dissonance (e.g., guilt) if they then go home only to dispose of the very same materials with the general waste. Studies have shown that in order to avoid unwelcome feelings of dissonance an individual might change their behaviour in order to achieve consistency with their values (e.g., Thøgersen & Ölander, 2006). It has also been found, for example, that having conceded to a relatively undemanding request (e.g., placing an advert in one's window) that people are subsequently far more likely to concede to a far more demanding request (e.g., erecting a large sign in one's garden). This behavioural change technique known as a "foot in the door" approach (Freedman & Fraser, 1966) suggests that people have a preference for acting consistently.

It is likely that the person who observes that they are undertaking increasingly demanding steps for a cause goes on to infer that they must be very committed to the cause, thus, shaping their *self-perception* (Freedman & Fraser, 1966). Someone, for example, who saves energy in their home and subsequently invests in a solar panel, may deduce that: a) they have a positive attitude to the environment, and b) that having undertaken these actions signifies that they are a pro-environmental person. Indeed, coming to see oneself as "pro-environmental" has itself been found to be an important antecedent of behaviour change (e.g., Sparks & Shepherd, 1992). Furthermore, simply taking an initial action may serve to enhance a person's perception of their own *self-efficacy* (Bandura, 1977). Having succeeded in recycling once, for instance, a person may infer that not only are they able to recycle again but they can also manage their green waste by composting. Finally, *increased knowledge* (e.g., Thøgersen, 1999) and the development of *personal (moral) norms* (see, Schwartz, 1977) have been seen as important in developing consistent behaviours. Participating in recycling, for example, could increase a person's awareness of waste related issues (e.g., pollution) and feelings of personal responsibility resulting in them taking further actions (e.g., buying loose rather than packaged vegetables); while undertaking pro-environmental actions may

also make environmental concerns more salient and eventually lead to habitual behaviours (Meijers, Noordewier, & Avramova, 2014).

There is some evidence providing insight into the possible mechanisms behind spillover. For example, the adoption of one new behaviour has been found to encourage the uptake of other new behaviour. For instance, following the introduction of traffic congestion charging in Stockholm it was found that the policy not only directly mitigated traffic congestion but also affected other pro-environmental behaviours, such as, increasing energy and resource conservation (Kaida & Kaida, 2014). Perhaps having a greater awareness of the impacts of their commuting habits also made people consider other ways their lifestyles were adversely affecting the environment (Kaida & Kaida, 2014). Studies also suggest that existing behaviours may result in spillover effects. A study of 1,450 UK households, for instance, found self-reported increases in waste prevention activities over the course of two years, with 50% of participants accounting for the change as a 'natural step' i.e., a behavioural spillover (Tucker & Douglas, 2007). Situational factors are a third potential mechanism for spillover, with behaviours in one domain influencing those in another domain – as illustrated by the example of recycling described above (see, Rashid & Mohammad, 2012).

While, there are good theoretical reasons to expect positive spillover, in practice, quite the opposite effects are sometimes seen (Austin et al., 2011). "Negative spillover" describes the phenomenon whereby engaging in one pro-environmental behaviour actually decreases the likelihood of someone performing a subsequent pro-environmental behaviour (Truelove, Carrico, Weber, & Raimi, 2014). The mechanisms or catalysts which determine whether positive or negative spillover occur are currently not well understood making it difficult to design effective interventions to promote pro-environmental behaviours (see Austin et al., 2011). Furthermore, relatively little research has been undertaken to directly test for negative spillover with much of the reported evidence being generated as side effects of main studies (for reviews see, Austin et al., 2011; Truelove et al., 2014). A number of theories are currently in use to explain the phenomenon of negative spillover including neo-classical economic theories such as rebound (Jevons, 1865; Sorrell, 2009) and psychological mechanisms such as moral licensing (Monin & Miller, 2001) which can be seen as a type of justification for desirable but environmentally detrimental actions. Compensatory beliefs have also been proposed as a specific type of justification – allowing people to reason that they can

undertake fewer pro-environmental behaviours on the basis that they have acted, or indeed, could act pro-environmentally in the future to compensate (Kaklamanou, Jones, Webb, & Walker, 2015). Currently, further research is required to better understand the specific mechanisms (psychological and/or economic) which underlie positive and negative spillover effects in order that more effective behavioural interventions may be designed. At present it is uncertain, for example, the circumstances under which one pro-environmental behaviour will encourage or inhibit another.

The following sections will provide an overview of some of the main theories and mechanisms which attempt to explain negative spillover effects, namely:

- Economic Theory: Rebound Effects
- Psychological Mechanisms:
    - Licensing Effects
    - Entitlement to Reward
    - Prior Restraint
    - Prior Success or Failure
    - Compensatory Beliefs

A more in-depth overview of the literature on Compensatory Beliefs will be provided because: 1) extensive research within health psychology has associated Compensatory Beliefs with slow or unsuccessful goal attainment, and 2) because Compensatory Beliefs are a relatively new and unexplored potential psychological mechanism underlying rebound effects.

1.3.1. Rebound, a neo-classical economic account of negative spillover

The roots of the *'rebound'* debate lie in a work produced by Jevons (1865) entitled: The Coal Question: An Inquiry Concerning the Progress of the Nation, and the Probable Exhaustion of our Coal-mines. Jevons's claim was that more efficient steam engines would not result in the more economical use of fuel but would actually accelerate overall coal consumption. Jevons considered the case of the early Savery engine which was intended to pump water from mines. Initially the Savery engine had required so much coal to run that it was impractical. However, once steam engine design was improved the technology became viable. This allowed for more coal to be extracted more economically, thus reducing the price of coal. Lower priced coal was then used in

a range of other steam engines including those which pumped air into furnaces. This in turn meant that less coal was required to make iron, thus, reducing the cost of iron production and, thereby, making it more economical to produce even more steam engines. The increased efficiency of the mine pumps could be seen to creating a positive feedback cycle (Sorrell, 2009). Jevon's argument, therefore, was that increasing efficiency accelerated demand meaning that overall coal consumption was vastly increased.

More recently, ecologically orientated economists have raised concerns over environmental sustainability strategies which focus on efficiency gains (Alcott, 2005). The concern is basically the same – namely that efficient equipment designed to reduce energy consumption will also lower energy prices, eventually lowering the cost of making or using the equipment or services and making it more economical to increase production or use. For example, an individual may be able to afford to increase their use of lighting services because they have switched from inefficient incandescent bulbs to efficient LEDs or they may be able to drive further because they have invested in a more efficient car (Berkhout, Muskens, & Velthuijsen, 2000). These adjustments in behaviour are described as a "direct" rebound effect. Examples of "indirect" effects might include an individual using the financial savings achieved through home insulation to fund travel abroad resulting in more fuel use and carbon emissions than would have been generated prior to the efficiency measure being taken. The sum of these direct and indirect effects are thought to result in economy wide impacts with more energy, services and materials being used than before (Sorrell, 2007).

Actual estimates of the magnitude of rebound effects are subject to considerable debate because of complexities in defining and measuring the resulting efficiency losses (Sorrell, 2007). This is because rebound effects span a variety of technologies, sectors and income groups on local, national and even international levels (Sorrell, 2007). The quantification of rebound effects is further complicated by limitations in data, effects which are trans-boundary and uncertain causal relationships (see Druckman, Chitnis, Sorrell, & Jackson, 2011; Sorrell, 2007). In light of this, it is perhaps unsurprising that estimates of rebound show considerable variation depending on the factors included and the scale of the study. For example, while Berkhout et al. (2000) argue that rebound effects are probably small (0-15%), other studies argue that rebound effects can be sufficiently large in some cases to completely undermine efficiency savings and actually

result in increased energy use — a phenomenon known as 'backfire' (Sorrell, 2007, p. v). Where rebound effects are quantified, they are usually presented as a percentage of the expected efficiency savings. A rebound effect of 20%, for instance, signifies that 80% of the expected energy savings were achieved (Sorrell, 2007). Perhaps because of the complexity of the task the number of studies evidencing and quantifying indirect economy wide rebound effects are far fewer in number than those studying direct effects with the result that we can have less certainty in estimating total rebound effects (Sorrell, 2007).

Explanations of rebound have traditionally stemmed from Neo-Classical economic theories regarding resource management (Berkhout et al., 2000). One of these principles is that of *rationality*. The idea is that individuals always prefer to maximise utility and will act to maximise gains and minimise losses. This principle of rationality with regard to resource management is in fact central to the concept of rebound. The rebound theory, for example, assumes that the purchaser of the more efficient car *will* drive further. However, not all Neo-Classical principles of resource management are so easy to apply. For example, in order to always efficiently maximise profit and minimise loss it is assumed that individuals can consistently act to optimise utility based on a complete knowledge of the facts. In everyday life, however, this is not so easy. For example, energy bills tend not provide a comprehensive breakdown of the consumption of each household device meaning that the consumer is unlikely to be fully informed of the costs of running their household appliances without going to considerable effort (e.g., obtaining an energy monitor) (Berkhout et al., 2000).

Secondly, Neo-Classical principles assume that the cost of making the transition from one optimum to another is negligible. As psychological studies have shown, however, this is not always the case because individuals are not only loss adverse but may make emotional as well as financial investments in their purchasing decisions (Gifford, 2011). For example, once someone has invested in a car and felt the benefits of car ownership such as the greater convenience or status they may be very reluctant to give up the car even though they know that using public transport or cycling would have greater financial benefits (Gifford, 2011). In short, people may simply be willing to pay more for luxury or convenience and value these more highly than financial rewards. Therefore, while neo-classical economic models of rebound might be useful for

understanding economic trends and financially motivated behaviours they are likely to find it more difficult to account for decisions based on other values.

1.3.2. Potential psychological mechanisms underlying negative spillover

Psychology provides another account of decision-making – considering how people may make seemingly irrational or sub-optimal decisions (e.g., opting for short term gains with negative long term consequences). This section will provide a brief explanation of self-regulation dilemmas and how these may lead people to justify acting counter to their long term goals. Self-regulation is defined here as the effort a person invests in directing their thoughts, feelings, desires and actions towards obtaining a personally important goal. Conversely, a failure to exert control over these is described as a self-regulatory failure and may result in unsuccessful goal pursuit.

Self-regulation dilemmas are typically seen to involve a conflict between the desire for immediate gratification (e.g., eating a delicious steak) and the necessity of resisting in order to achieve long term goals (e.g., reducing personal carbon emissions) (Rabiau, Knäuper, & Miquelon, 2006). A fundamental principle of effective self-regulation is the ability of the individual to rise above immediate temptations in order to focus on their long term goals (De Witt Huberts, Evers, & De Ridder, 2014a). That people often fail in this is illustrated by a range of societal problems such as obesity, credit card debt and environmental issues.

Traditionally, self-regulation has been seen to be governed by two conflicting systems which compete for control. The cool, rational or reflexive self that works towards long term goals is seen to compete with the hot, irrational and impulsive self that craves immediate gratification (e.g., Metcalfe & Mischel, 1999; Strack & Deutsch, 2004). When people are in a depleted state (e.g., fatigued) they are seen as being vulnerable to being governed by the impulsive self. In contrast when the cognitive resources are available people are seen as more likely to act rationally and in line with their intentions and long term goals (see Muraven & Baumeister, 2000). This account of inconsistent behaviour suggests that seeking balance (e.g., between effort and relaxation) is a natural and perhaps mainly subconscious process underlying self-regulation.

While self-regulation failures can occur as a result of non-conscious processes there is also evidence that people knowingly and willingly succumb to temptation by

rationalising their indulgences (see, De Witt Huberts et al., 2014a). For example, it has been found that people are more likely to arrive at conclusions which they find desirable providing that they are able to produce some sort of justification for their choice (Kunda, 1990). Furthermore, it has been found that simply having a justification seems more important than the quality of the reason itself (De Witt Huberts et al., 2014a; Shafir, Simonson, & Tversky, 1993). The implication of this is that our reflective faculties are being used to facilitate seemingly "irrational choices" which may be counter to our best interests (De Witt Huberts et al., 2014a). These types of justification are most likely to occur when a dilemma is encountered and, acting in accordance with one's earlier intentions is consequently more challenging. The actual form of justification used is likely to be determined both by the idiosyncrasies of the individual and also by the exact nature of dilemma being encountered (De Witt Huberts et al., 2014a). Nonetheless, a number of broad categories of justification have been identified some of which have aspects in common (De Witt Huberts et al., 2014a; De Witt Huberts, Evers, & De Ridder, 2014b). These justifications are presented below.

1.3.2.1. Licensing effects: balancing moral accounts

Broadly speaking, self-licensing can be seen as a form of justification. Put very simply the basic idea is that having undertaken one moral behaviour people are subsequently less likely to undertake another moral behaviour and vice versa (see meta-analysis by Blanken, van de Ven, & Zeelenberg, 2015). Insofar as pro-environmental behaviours can also be viewed as moral or altruistic – because they tend to have societal benefits such as reduced pollution (Bamberg & Möser, 2007) – licensing may also be expected to occur within an environmental domain. For example, a person who has invested in more efficient appliances might feel that they have built up sufficient "credits" to license the undertaking of behaviours which are less pro-environmental but nonetheless enjoyable (e.g., using the appliances for longer). This *moral credits model* sees pro-environmental behaviours as being comparable to a bank account or a carbon off-setting scheme (Miller & Effron, 2010) where pro-environmental behaviours earn moral "credits" which can be "spent" on off-setting enjoyable but less pro-environmental behaviours. To use the same analogy – in cases where the pro-environmental behaviour did not fully off-set the less pro-environmental behaviour the accounts would not balance and negative spillover effects could occur.

Evidence of moral-licensing effects has been found with respect to environmentally significant behaviours – with studies finding that participants were willing to make trade-offs between very different kinds of behaviours. For example, Sachdeva, Iliev, & Medin (2009) conducted a study where participants were asked to imagine managing a manufacturing a plant that was releasing pollutants. Participants who had just reflected on their positive traits stated that they would only co-operate by running costly pollution filters 56% of the time. In contrast participants who had previously reflected on their negative traits volunteered to run the filters 73% of the time. Similarly, Mazar and Zhong (2010) found that following engagement in a pro-environmental behaviour participants were less cooperative and more likely to cheat, while Klöckner, Nayum, and Mehmetoglu (2013) found that drivers of electric cars felt less obligated to act pro-environmentally. It seems that acting morally or pro-socially was used by participants to license morally dubious or environmentally detrimental behaviours.

Miller and Effron (2010) also propose that licensing may be mediated by the way in which people construe their behaviour – calling this the *moral credentials model*. This account differs in that rather than simply "purchasing" a license to harm the environment in some way – the previous moral decision allows the current transgression to actually be construed differently. For example, it was found that having endorsed Obama as a black president, participants who scored highly on a measure of racial prejudice were more likely to subsequently allocate more money to an organisation favouring white people at the expense of black people (Effron, Cameron, & Monin, 2009). In short it seems that having demonstrated their non-racist credentials, these participants felt able to act in a more discriminatory fashion without the fear of being judged to be racist. It might similarly be expected that people may use tokenistic efforts in being pro-environmental in order to defend acting in environmentally detrimental ways in other areas of their lives.

1.3.2.2. "Work hard, play hard": Entitlement to a reward

Notably, some justifications relate to ideas about entitlement or earned rewards (e.g., Taylor, Webb, & Sheeran, 2014). For instance, having first imagined undertaking an altruistic or laudable act such as donating to charity, caring for the homeless or working to benefit the environment, people have been found to subsequently show a strong preference for luxury goods (e.g., designer wear) over and above utility products (e.g.,

vacuum cleaner) (Khan & Dhar, 2006). Khan and Dhar (2006) propose that even imagining acting morally (as opposed to actually acting) can enhance people's positive self-concept, thus, licensing them to indulge. In short, it seems that having focused on being virtuous, people subsequently felt they deserved a treat.

Similarly, prior effort and achievement have been identified as justifications to indulge in "forbidden treats" (De Witt Huberts et al., 2014a; Kivetz & Simonson, 2002). Having worked hard or received recognition for their efforts people tend to feel that they have earned a reward. Xu and Schwarz (2009), for example, showed that people expected that they would feel less negative about indulging if they could justify the treat based on good performance or high effort. This particular rationale can be traced back to puritanical ideas about the necessity of earning rewards (see, Weber, 2002). Furthermore, in the case of both these types of justification the licensing is not domain specific; rather participants felt able to treat themselves to something unrelated to their performance (De Witt Huberts et al., 2014a). In a study by De Witt Huberts, Evers, and De Ridder (2012), for example, a group of participants who were under the erroneous impression that they had worked twice as hard as another group on a computer based task appeared to feel licensed to eat significantly more sweet snacks.

1.3.2.3. Prior restraint: "I was good then so I don't need to be good now"

Another justification is that of prior restraint. Mukhopadhyay and Johar (2009), for example, found across a series of studies that the salience of previous restraint can, somewhat ironically, lead participants to not exercise restraint in a subsequent situation. In this case, after recalling successfully resisting purchasing a tempting product, participants were subsequently more likely to select an indulgent product. This effect has also been found in moral decision-making. A series of experimental studies by Effron, Miller, and Monin (2012), for instance, demonstrated that people strategically used forgone misdeeds to regulate their moral behaviour. For example, participants who were given the opportunity to demonstrate their non-racist attitudes subsequently felt licensed to express less racial sensitivity. Put simply, these participants felt able to show bias based on the fact that they had previously not exercised bias. In another study the same effect was found in relation to health. Dieters who reflected on the unhealthy alternatives to their previous behaviours demonstrated weaker intentions to pursue weight-loss goals and one week later reported that they undertook fewer weight

management activities and would continue to be less active in this respect (Effron, Monin, & Miller, 2013). In sum, these studies indicate that people who recall a time when they resisted a temptation may use their previous restraint as a justification to succumb to a current temptation.

1.3.2.4. Prior success or failure: perceptions of goal progress

A related justification is that of prior success or failure. People are driven by multiple and conflicting goals; they may want to save time by eating fast food and also desire to eat more healthily or they might want to save for retirement and also indulge in an expensive luxury holiday (Fishbach & Dhar, 2005). Four studies conducted by Fishbach and Dhar (2005) demonstrated that perceived progress on one goal enabled people to feel able to temporarily relax from pursuing that goal and instead pursue a different or even opposing goal. They found, for example, that eighty-five percent of dieters who assessed their progress towards achieving their desired weight using a wide scale (scale points were suggestive of faster progress) chose a chocolate bar rather than an apple in recompense for participation, while 58% of participants who assessed their progress using a narrow scale (scale points were suggestive of slower progress) chose an apple instead. In short, those dieters who felt that they had made good progress subsequently lapsed in their goal pursuit by selecting a less healthy high calorie snack over a low calorie healthy snack. Conversely, a previous failure can also result in the abandonment of goal pursuit. For example, it has been found that some people who break their diet go on to subsequently eat with less restraint (see, De Witt Huberts, Evers, & De Ridder, 2013). This is known as the "what the hell" effect (Cochran & Tesser, 1996). In such cases someone might reason that having already broken their diet they may as well indulge in the foods they had previously worked to resist.

1.3.2.5. Negative emotional events: seeking comfort

It can be seen from the overview of models of pro-environmental behaviour provided in Section 1.2, that relatively little attention has been given to discussing the relationship between affect and pro-environmental behaviour. This is because relatively few studies have, in fact, attempted to specifically model affect as a predictor of pro-environmental action (see, De Young, 2000; Lindenberg & Steg, 2007; Steg & Vlek, 2009).

Negative emotional events may, however, be relevant to environmental behaviours because they can be used as a justification to abandon goals. For example, De Witt Huberts, Evers, and De Ridder (2012) conducted a study where participants were either highly aware or minimally aware of being exposed to aversive images. Both groups reported similar levels of negative affect. However, only the group that was highly aware of seeing the images consumed significantly more snacks. It seems that only those participants who were highly aware of being exposed to aversive images were equipped with a reason to justify the indulgence (for an overview, see De Witt Huberts et al., 2014a). Similarly, effects have been found in the context of moral decision making. Experiments conducted by Zitek, Jordan, Monin, and Leach (2010), for example, found that recalling unfair treatment resulted in participants being less willing to help the experimenter on another task and that participants who lost on a computer game for an unfair reason (e.g., technical fault) were more likely to act selfishly with respect to money allocation for participation in a future task. In short, it appears that participants who felt that they had been wronged in some way could justify acting more selfishly.

1.3.2.6. Compensatory beliefs: minimising harm and maximising pleasure

Compensatory beliefs, namely the belief that the negative effects of one behaviour can be compensated for or off-set by engaging in another behaviour (Rabiau et al., 2006) can be seen to constitute another form of justification for deviating from goals. Compensatory beliefs have risen to prominence within the health psychology where they have been associated with poor diabetes and weight loss management, failure to quit smoking and other issues in adopting healthier lifestyles (Kronick, Auerbach, Stich, & Knäuper, 2011; Miquelon, Knäuper, & Vallerand, 2012; Monson, Knäuper, & Kronick, 2008; Radtke, Scholz, Keller, & Hornung, 2012; Radtke, Scholz, Keller, & Knäuper, 2011). Compensatory beliefs are seen as maladaptive. This is because compensatory beliefs allow people to justify deviations from pursuit of long term goals (Miquelon et al., 2012). Furthermore, compensatory beliefs may be inaccurate. A compensatory behaviour (e.g., exercise) does not necessarily fully address the damage caused by the unhealthy behaviour (e.g., smoking). Another related concern with compensatory beliefs is that individuals do not actually undertake the planned compensatory behaviour. People may not, for example, act immediately and over time

their feelings of guilt may subside, thereby reducing their motivation to actually act in a compensatory manner (Kronick et al., 2011; Rabiau et al., 2006). While compensatory beliefs may seem like an appealing way to resolve a dilemma (i.e., indulge now and pay later), they can pose challenges to the long term achievement of goals.

Research from health psychology suggests that whether an individual forms or endorses a compensatory belief as opposed to adjusting outcome expectancies or finding another solution to their dilemma (e.g., resisting the desire to travel by car) is likely to depend upon: (a) the person's self-efficacy; (b) the strength of their motivation to pursue the goal; and (c) how desirable the alternative behaviour is believed to be (Rabiau et al., 2006). Individuals with high levels of self-efficacy and strong motivation to pursue their goal are better placed to resist the temptation and are, therefore, less likely to employ compensatory beliefs than individuals with lower levels of self-efficacy and motivation. Individuals are also unlikely to feel the need to use compensatory beliefs when a behaviour is very desirable because the desirability of the behaviour can in itself provide sufficient reason to indulge (Taylor et al., 2014). Compensatory beliefs are, therefore, associated with behaviours that are only moderately desirable (i.e., as opposed to irresistible or less desirable behaviours) (Miquelon et al., 2012; Rabiau et al., 2006).

1.3.3. Compensation within an environmental domain

Recent research has looked for evidence of compensatory beliefs in relation to behaviours that impact on the environment (e.g., that the positive consequences of recycling can somehow compensate for energy in-efficient behaviours) (Bratt, 1999; Kaklamanou et al., 2015). Specifically, there are concerns that, just as people with the goal of achieving healthier lifestyles employ compensatory beliefs to justify acting in unhealthy ways, people may also justify desirable but environmentally detrimental behaviours on the basis of compensatory beliefs (Bratt, 1999; Kaklamanou et al., 2015). Compensatory beliefs could hinder the adoption of lower carbon lifestyles in the sense that they allow individuals to justify environmentally detrimental actions on the basis that they can compensate for any negative consequences at another time. To date, however, despite the significant applied and theoretical implications of compensatory beliefs in relation to environmental behaviours, relatively little is known about the

nature and extent of compensatory beliefs in this domain (Bratt, 1999; Kaklamanou, Jones, Webb, & Walker, 2013; Kaklamanou et al., 2015).

There are a number of reasons to suspect that compensatory beliefs may occur within an environmental domain (see Kaklamanou et al., 2015). In the same way that people working towards long-term health goals may be tempted to indulge in pleasurable but unhealthy activities, people striving to live more pro-environmental lifestyles but who live in societies where many activities with high environmental impacts are considered desirable (e.g., air travel) are likely to experience conflict between their short- and long-term goals (e.g., between convenience and the desire to avoid undue harm to the environment). It could be hypothesised that this will be especially likely in societies where economic growth (e.g., through increased spending on consumer goods) and lower carbon lifestyles (e.g., through consuming fewer products and services) are simultaneously promoted. It is probable, therefore, that there will be people within these societies who have internalised pro-environmental goals and values – and so feel guilty when acting in a manner that perceptively damages the environment (see, Bamberg & Möser, 2007) – but who nevertheless partake in socially-desirable but environmentally detrimental activities (e.g., driving sports cars, air travel, eating imported foods etc.). In these contexts, it could be reasonably predicted that such individuals might seek to employ compensatory beliefs in order to permit such activities (e.g., someone justifies their inefficient sports car on the basis that they have solar panels on their home). However, while such ideas seem feasible, there has been little research to date into the extent or nature of environmental compensation. The present research will therefore aim to address this gap.

Furthermore, while we may expect to find compensatory beliefs in relation to environmental behaviours just as previous research has found them with respect to health behaviours, important differences might also be expected. For example, unlike pro-environmental behaviours, health behaviours tend to have direct personal costs and benefits (Nisbet & Gick, 2008). The dieter, for instance, who abstains from delicious but unhealthy foods does so at some cost to their enjoyment of food, but receives the health benefits. In contrast, pro-environmental behaviours are often associated with personal costs (e.g., in time, money, or effort) but the personal benefits are spatially and temporally removed (Nisbet & Gick, 2008; Pahl, Sheppard, Boomsma, & Groves, 2014). For example, recycling can be effortful and the benefits (e.g., reduced waste in

landfill, carbon emissions) may not be immediately apparent or directly beneficial to the individual doing the recycling. For this reason, pro-environmental behaviours can be viewed as having an altruistic or moral component (see Heberlein, 1972; Stern, 2000). These social and moral aspects to pro-environmental behaviours may mean that compensation in an environmental domain is related to moral licensing mechanisms – which could result in important differences in the way in which compensatory beliefs are used in environmental and health domains. To date, however, little research has been undertaken in this area.

1.4.Summary and future directions

This chapter began by outlining the need for behavioural change in order to address growing environmental concerns including serious climate change. Following this a number of the main models developed within psychology and applied to understanding (dis)engagement in pro-environmental behaviours were provided. It was argued that moral, affective and normative factors were valuable additions to rationalistic models in accounting for behaviours which often come with no direct personal benefit but which bring benefits to wider society. The models also served to illustrate the complexity of environmental behaviours and to highlight the challenges faced by those designing behavioural interventions. The issue of negative spillover was then presented – with evidence suggesting that having engaged in one pro-environmental behaviour people may subsequently be less likely act less-pro-environmentally. A variety of possible mechanisms underlying negative spillover were explored including both rationalistic economical models and also psychological mechanisms.

In this chapter, it was argued that people may act in seemingly irrational ways while pursuing goals (e.g., "being pro-environmental") by employing justifications which permit them to licence succumbing to temptations on the basis that they may be able to balance out the negative consequences resulting from their behaviour at another time. A number of the justifications presented in fact involved the idea of "balancing" short term desires with longer term goals. Taken together, these strategies can be seen as ways of: 1) justifying deviations from what is socially acceptable (e.g., being racist) and 2) maintaining a sense of consistency even while acting in a way which appears to run counter to goal pursuit. Ironically, however, it seems that in attempting to maintain

some form of consistency people end up behaving in seemingly irrational, counterproductive or inconsistent ways that could also be environmentally detrimental.

One such form of justification, namely the evocation of compensatory beliefs, was explored in some detail as a potentially important underlying psychological mechanism behind negative spillover effects (Bratt, 1999; Kaklamanou et al., 2015). From the review of literature presented in this chapter it can be seen that compensatory beliefs ostensibly relate to many other forms of justification. Compensatory beliefs could, for instance, be seen to partly underpin justifications based on prior restraint (e.g., I resisted driving yesterday which compensates for my driving today). Compensatory beliefs can also be seen to relate to moral licensing, insofar, as the belief that one behaviour can off-set the negative consequences of another may permit someone to act counter to their goals. Research into compensatory beliefs could, therefore, provide valuable insights into a variety of mechanisms potentially underlying negative spillover effects.

1.5. Thesis Structure

The chapter raised a number of important questions including the following:

- Do people use compensatory beliefs to licence engaging in environmentally detrimental behaviours?
- What is the nature of the compensatory beliefs that people hold with respect to environmental behaviour?
- Do compensatory beliefs provide a useful framework for understanding why people face difficulties in achieving their pro-environmental goals?

The remainder of this thesis will aim to address these questions and will be structured as outlined below.

Chapter 2 presents the results of Study 1 and investigates whether and to what extent compensatory beliefs may be used within an environmental domain using exploratory qualitative methods. A total of 40 people participated in a think aloud exercise and semi-structured interview. The chapter presents evidence showing that participants did employ compensatory beliefs to license engaging in environmentally detrimental behaviours. However, it will be also be shown that these beliefs differed in some important respects from the kinds of statements used to assess compensatory belief endorsement in a previous questionnaire study (Kaklamanou et al., 2015). Study 1 also

presents evidence indicating that compensatory beliefs within an environmental domain are not only employed to resolve feelings of dissonance but also play a role in reputation management (i.e., maintaining green credentials).

Insofar as the findings of qualitative research are best described as 'transferable' (in that they may be applied where similar situations of people exist) caution should be used in making any generalisations from the data. For this reason, the findings of Study 1 are followed by a series of experimental studies.

Chapter 3 presents the findings of Study 2 which was designed to further assess the relationship between environmental guilt and compensation. In line with the literature on compensation within a health domain, it was anticipated that participants who reflected on how their lifestyles had caused harm to the environment (guilt condition) would have stronger (compensatory) intentions to be pro-environmental in future and would volunteer more hours to an environmental charity than participants asked to reflect on how their lifestyles benefited the environment or the control condition. The results show that guilt predicted (compensatory) intentions to be pro-environmental in future but not willingness to volunteer.

Chapter 4 presents Studies 3 to 5 which further explore the nature of compensatory beliefs within an environmental domain. Research from health psychology suggests that people use compensatory beliefs in order to strike a balance between maximising pleasure and minimising harm (Rabiau et al., 2006). Studies 3 to 5, therefore, look for evidence of compensation across a series of environmentally related scenarios using vignettes. It was hypothesised that a "flip-flopping" pattern would be seen in the data if participants were alternating between more personally beneficial but environmentally detrimental behaviours and vice versa. After controlling for the extent of participants' green identity this pattern can be seen in Study 3. However, the data presented in Studies 4 and 5 suggest that participants are acting consistently rather than "flip-flopping". Possible explanations for these mixed findings are explored both within Chapter 4 and also within the main discussion in Chapter 6.

Chapter 5 presents the findings of Study 6 and explores the mechanisms underlying goal pursuit by looking at the influence of affect and goal construal on compensation (Fishbach, Dhar, & Zhang, 2006; Fishbach, Eyal, & Finkelstein, 2010). The results of Study 5 suggest that participants who are lead to perceive that they are advancing

towards pro-environmental goals are more highly motivated to continue pursuing pro-environmental goals.

Finally, Chapter 6 aims to draw together and contextualise the findings from the 6 studies. The chapter concludes by outlining some of the limitations of the studies which are very briefly outlined above and provides some future directions for research within this field.

2. Chapter 2 – A qualitative exploration of endorsement of compensatory green beliefs

2.1. Introduction

The preceding chapter discussed how compensatory beliefs within an environmental domain could be problematic – potentially leading to negative spillover effects, whereby, engaging in one pro-environmental behaviour subsequently decreases the likelihood of undertaking a subsequent pro-environmental behaviour) (Truelove, Carrico, Weber, & Raimi, 2014). The reason for such concerns is that studies within health psychology have shown that compensatory beliefs are associated with maladaptive behaviours. Compensatory beliefs, for example, allow people to permit deviations from long term goals, while in cases where beliefs are inaccurate or where people do not follow through with the planned compensatory action, risks to long-term goal achievement (and health) are increased.

Compensatory beliefs pertaining to environmental behaviours have been termed as "Compensatory Green Beliefs" (or CGBs). Kaklamanou, Jones, Webb, and Walker (2015, p. 3) define CGBs as:

> the idea that the positive consequences of proenvironmental behaviors (e.g., switching to a "green" energy tariff) can somehow compensate for the negative consequences of energy-inefficient or unsustainable behaviors (e.g., leaving the heating on while not at home) and/or the reverse idea that engaging in energy-inefficient behaviors can be compensated for by engaging in energy-efficient behaviors (e.g., using public transport).

The concept of compensation can be seen as analogous to carbon off-setting whereby someone can permit themself to act in a way that they know is detrimental to the environment on the basis that their previous or future pro-environmental actions will in some way neutralise the negative consequences of their behaviour. A study conducted by Miller, Rathouse, Scarles, Holmes, and Tribe (2010), for example, found that people had a widely held belief that their everyday pro-environmental behaviours (e.g., reusing carrier bags and using low energy bulbs) had greater environmental benefits than changes to their tourism behaviour (e.g., air travel) could achieve (also see McDonald, Oates, Thyne, Timmis, & Carlile, 2015). Research has also suggested that recycling

may enable individuals to feel absolved from undertaking other pro-environmental actions (e.g., Barr, 2007; Thøgersen, 1999). These examples suggest that people may feel that their pro-environmental behaviours can somehow compensate for their omissions to act pro-environmentally in other ways. Where such beliefs are inaccurate (e.g., believing that carrier bag re-use can compensate for air travel) or where people fail to follow through with the planned compensatory behaviour increased environmental damage may be expected.

While there are reasons to believe that compensatory beliefs are occurring in relation to environmental behaviours, attempts to assess the extent to which such beliefs are endorsed have encountered difficulties. Bratt (1999), for example, conducted a postal survey of 1,500 randomly selected Norwegian consumers from four cities in order to investigate whether interventions to promote recycling had unintended negative consequences on other pro-environmental behaviours (e.g., driving habits). Participants were asked to what extent they agreed with three compensatory statements (e.g. "If I deliver paper and glass to recycling bins instead of throwing them out along with other garbage, I'm already doing something for the environment. Then it doesn't matter that much if I use my car to some extent"). It can be seen from this example that a possible criticism of Bratt (1999) is that the scenarios had many components and, thus, people could disagree at a number of different junctures. Agreement levels with the three statements was relatively low being 13.2%, 3.5% and 17.1% respectively. The study led Bratt (1999) to conclude that there was no evidence that the introduction of measures to promote recycling had resulted in compensatory behaviour or attitudes. Kaklamanou et al. (2015) recruited 770 participants through university mailing lists and leaflets to the wider local community and found similar results. Average agreement with a series of statements describing compensation in relation to a range of everyday activities such as shopping, driving, water and electricity consumption and travel (e.g., walking to the supermarket can compensate for buying highly packaged food) was just 8.13% (Kaklamanou et al., 2015).

It is not known, however, whether the findings of Bratt (1999) or Kaklamanou et al. (2015) suggest that low levels of compensation are likely with respect to environmental actions or whether they reflect something about the sensitivity of the measures used to identify the extent of people's compensatory beliefs in this domain. There are reasons to suspect the latter. For example, Kaklamanou et al. (2015) found a negative correlation

between a measure of socially desirable responding and the endorsement of CGBs, which could suggest that CGBs were underreported (for a review of self-report validity see, Kormos & Gifford, 2014). Participants, for instance, may have been reluctant to admit to making trade-offs concerning environmentally significant behaviours because of concerns about being seen as inconsistent or hypocritical (Merritt, Effron, & Monin, 2010). Furthermore, as pro-environmental behaviours may be associated with moral and social norms, participants may have been reluctant to admit to endorsing some CGBs or may have disagreed with compensations in principle on moral grounds (Kaklamanou et al., 2015). In addition, Kaklamanou et al. (2015) suggest that their study may have provided a conservative estimate of the endorsement of CGBs because: (a) The study was advertised as relating to energy and environmental issues meaning that a disproportionate number of people with an interest in being pro-environmental may have chosen to respond; (b) the statements were framed in a definitive way that did not permit participants to indicate an "it depends" response (e.g., action A *will* compensate for action B); and, finally (c) participants may have disagreed with the specific combination of compensatory elements within an item (i.e., they may think compensation is possible, but not in that specific instance). For example, participants may have agreed that it is possible to compensate for driving a car but not that recycling presents a suitable opportunity for such compensation.

Similar issues may have arisen in the study by Bratt (1999). For example, participants may have disagreed with the specific combinations of compensatory actions as outlined by Bratt. Notably, one item: ("If one doesn't drive a car to work, one is already doing something for the environment. Then it doesn't matter that much if one travels by airplane on holiday, even though the airplane uses a lot of fuel and possibly harms the environment") – where both behaviours were travel related received relatively high endorsement (17.1%) compared to the other two items where the behaviours were less related (recycling and driving). This could suggest that response rates were affected by the composition of the items (i.e., relatedness of the behaviours) and may not accurately reflect actual levels of endorsement.

2.2. Study 1

As discussed in the preceding chapter, there are likely to be situations in which people feel the need to justify engaging in behaviours that ostensibly damage the environment.

For example, many behaviours which are known to be carbon intensive may also be deemed otherwise desirable (e.g., air travel, eating meat, running a car) causing individuals who aim to be more pro-environmental to experience goal conflict. Parallel research in health contexts suggests that one way in which people are likely to justify desirable behaviours that conflict with longer-term goals is through the activation and use of compensatory beliefs. However, despite the theoretical and applied importance of this idea, research on how similar notions of compensation might be used in relation to environmentally significant behaviours is in its infancy and extant empirical work only provides a partial account of whether, when, why and how compensatory green beliefs (CGBs) are held or acted upon. Study 1, presented in this chapter, aimed to address this gap in two ways. Participants first took part in a 'think-aloud' exercise (see Anders & Herbert, 1980) where they were required to articulate their thoughts while completing a self-report measure of CGBs developed by Kaklamanou et al., 2015. Second, the topics and issues raised during this 'think-aloud' exercise were explored in greater depth via semi-structured interviews.

Based upon the extant literature, it was predicted that participants should recognise and identify with the concept of CGBs as a means of justifying or self-licencing less environmentally friendly behaviours. Furthermore, it was expected that the research would help to: (a) elucidate under what circumstances CGBs might be activated and used; and (b) identify some of the idiosyncrasies around their use, which might make their measurement difficult and go some way toward explaining the low levels of endorsement seen in studies to date.

2.3.Method

2.3.1. Participants

Participants were contacted during spring 2013 via university mailing lists and community groups (e.g., a church, school, and environmental charity). A total of 41 participants took part, which is a comparable number to other think-aloud studies, (e.g., Darker & French, 2009; Kaklamanou, Armitage, & Jones, 2013) and also research using interviews to explore peoples' beliefs about issues pertaining to the environment, (e.g., Caperello & Kurani, 2012; Kaplan, Kaplan, & Austin, 2008). One participant was excluded because they did not talk out loud while completing the think-aloud exercise.

Participants ranged in age from 17 – 65 years with 52.5% indicating that they were aged between 22 – 44 years. Nineteen participants were male and 31 were educated to degree level or above. Thirty two participants were White British with the remaining participants classifying themselves as: White other (*n* = 4); Asian (*n* = 2); White Irish (*n* = 1); or Other (*n* = 1).

2.3.2. Procedure

Within each session participants took part in a 'think aloud' exercise, a semi-structured interview and then completed a short questionnaire. Sessions lasted between 45 and 60 minutes and participants were given £15 for their time.

Think-aloud exercise. All participants agreed to be audio-recorded and completed a think-aloud exercise with respect to the 20-item measure of CGBs developed by Kaklamanou et al. (2015). This scale can be seen in Appendix 1 on page 159. Participants familiarised themselves with the think aloud procedure by articulating their thoughts while responding to four items designed to measure compensatory health beliefs (e.g., "Smoking can be compensated for by physical activity"). The researcher provided instructions adapted from French, Cook, McLean, Williams, and Sutton (2007); namely that participants should vocalise their thoughts from the moment of reading the question to the time of giving their response and to act as if they were alone. Participants were then provided with a copy of the scale and invited to complete it in their own time while thinking aloud. While the participants were completing the scale the researcher sat out of view, only speaking to prompt the participant to keep talking if they were silent for 10 or more seconds (French et al., 2007).

Semi-structured interview. Each participant took part in a semi-structured interview immediately after they had completed the think-aloud exercise. Questions were designed to explore whether, when, why and how CGBs are held or acted upon and to clarify responses to the think-aloud exercise. Table 2-1 below provides a summary of the interview questions.

Questionnaire. Participants were given a short questionnaire designed to capture basic demographic information, environmental values and beliefs. The questionnaire used the same measures as those employed by Kaklamanou et al. (2015), including the following:

- A modified version of the *General Ecological Behaviour scale* (Kaiser, Wölfing, & Fuhrer, 1999). The original scale consists of 65 items each relating to an environmental behaviour (e.g., "I use a compost bin"). However, some items were removed (Kaklamanou et al., 2015) because they were considered inappropriate for a UK audience (e.g., "after meals, I dispose of leftovers in the toilet") while others were edited (e.g., kilometres were converted to miles). Participants responded using a yes/no/unsure response options. Responses were summed with higher scores indicating engagement in a greater number of pro-environmental behaviours.
- The *New Ecological Paradigm (NEP) Scale* (see, Dunlap, Kent, Mertig, & Jones, 2000) was included to assess the extent to which participants endorsed an ecological worldview (i.e., the belief that humans are part of, rather than, distinct from nature). This scale consists of 15 items (e.g., Humans are seriously abusing the environment) and participants are asked to indicate the extent of their agreement with each item using a 5-point scale anchored by strongly agree and strongly disagree. Responses were summed with higher scores being indicative of a stronger ecological worldview.
- A modified measure of *green identity* (see Whitmarsh & O'Neill, 2010) was included to assess the extent to which participants identified with being pro-environmental. Four items were included: 1) "I think of myself as someone who is very concerned with environmental issues"; 2) "I think of myself as an environmentally friendly consumer"; 3) "I would not want my family and friends to think of me as someone who is concerned about environmental issues" (Reverse coded) and; 4) "I would be embarrassed to be seen as having an environmentally friendly lifestyle" (Reverse coded). Agreement was measured on a 5-point scale anchored by "strongly agree" and "strongly disagree". Results were summed with higher scores indicating stronger green identities.
- A modified measure of *beliefs about climate change* (see, Spence, Venables, Pidgeon, Poortinga, & Denski, 2010). First, participants were asked: "Do you think that the world's climate is changing" and participants responded using yes/no/don't know response options. Participants were then asked to rate their level of concern about climate change using a 5-point scale for which the

options were: not at all concerned, not very concerned, fairly concerned, very concerned and don't know.

Table 2-1: Summary of interview questions

Type of Question	Question
Interview	• How did you find that (i.e., the think aloud exercise)? What did you think of the list of statements? • What do you think about the idea of "compensating"? In other words, the belief that performing a positive behaviour (e.g., switching to a 'green' energy tariff) can somehow compensate for performing a negative behaviour (e.g., leaving the heating on while not at home). • How effective do you think these compensatory actions might be? Can you think of an example? • Can you think of a time when you have done something which you thought was bad for the environment and tried to make up for it in some way? • Have you heard people say things similar to the statements on the list?
Following up questions on responses to the think-aloud	• You didn't say very much about why you agreed/disagreed with statement X what were you thinking? Why did you say that? • You seemed unsure about how to respond to statement X. Can you tell me more about why you were unsure?

2.3.3. Thematic analysis procedure

The data from the think-aloud protocol and semi-structured interviews were transcribed verbatim. The primary coder conducted an initial reading and proceeded to free code the transcripts by assigning conceptual labels to topics and refining these through a process of repeated examination (Braun & Clarke, 2006; Hannes, Janssens, & Wets, 2009). These codes were compiled into a coding manual that captured re-occurring themes in participants' beliefs and behaviours. Secondary coding was undertaken by another researcher leading to the continued refinement of the coding manual (see Braun & Clarke, 2006). This was an iterative process whereby the coding of randomly selected transcripts from each data set (think-aloud and interview) were discussed with the codes being revised as necessary (e.g., to provide clearer definitions) (Darker & French, 2009; Trickett, 2009). This process was repeated three times (i.e., for a total of 15 transcripts from each data set). Any remaining disagreements were resolved jointly through discussion. The final coding manual was then applied to the remaining transcripts by the primary coder.

2.4.Results and discussion

Participants' responses to the questionnaire measures assessing their environmental beliefs and behaviours can be summarised as follows: green identity (*M* = 13.48, *SD* = 2.33, maximum score of 16); New Ecological Paradigm (*M* = 46.61, *SD* = 8.96, maximum score of 64); and General Environmental Behaviour (*M* = 33.7, *SD* = 6.82, maximum score of 58). A total of 92.5% (*N* = 37) of participants thought that the climate was changing; 62.5% (*N* = 25) attributed climate change partly to human activity; 90% (*N* = 36) were fairly to very concerned and; 82.5% (*N* = 33) thought something could be done to tackle climate change.

The qualitative results are presented below. The results have been placed under broad headings which reflect the main research questions. The quotations provided are illustrative rather than exhaustive and provide an overview of the broader themes or "patterns" which emerged from the data.

2.4.1. Do people recognise and endorse compensatory green beliefs?

Participants seemed to recognise and endorse the concept of CGBs. For example, participants said:

> I suppose in a sense I am trading one off against the other and saying "well I'm allowed a bath once every couple of months if I have a shower all the rest of the time. (P09, female, 65 years or above)

> I'll often catch the school bus or I'll walk in the morning to school and then I often think well I've cut down on that so if I'm going out in the evening I ask my dad to give me a lift. (P19, male, 17-18 years)

Rather than forming a specific, prospective intention to compensate for an environmentally detrimental actions, the CGBs discussed by participants tended to be retrospective, involving past or ongoing behaviours that seemed relatively habitual (i.e., participants described behaviours that were performed repeatedly in similar situations) (Neal, Wood, & Quinn, 2006). Participants talked about striking an overall balance between their more and less pro-environmental behaviours – seeing compensation on a general cumulative or holistic level (i.e., these behaviours compensate for these other

behaviours) rather than on a one-one basis (i.e., this behaviour compensates for this behaviour):

> I think I shouldn't be buying it [out of season produce]. That's all. So the compensation is just from my regular habits that are positive in terms of the environment. (P04, female, 65 years or above)

> I do own a car and I don't have a dishwasher and there are things that are unavoidable in my day to day life that aren't good for the environment. By trying to keep everything else, like buying food and keeping electrical things turned off […] by trying to keep that as a whole, sort of more green, then I'm hoping to have a more positive effect on the environment or less of a negative effect, if you like […] I try to look at it like a sum of all parts rather than each individual activity. (P36, female, 22-34 years)

The cumulative and holistic nature of the compensatory beliefs expressed by participants in Study 1 makes them somewhat different from the statements that, for instance, feature in the measure of CGBs developed by Kaklamanou et al. (2015) (i.e. where single, pre-defined compensatory actions were pitted against one another). The fact that participants referred to habitual behaviours could also account for why the compensatory beliefs expressed by participants in Study 1 tended to be primarily retrospective (i.e., I did X, so it is okay to do Y) rather than prospective (i.e., I have done Y, so I need to do X). Participants seemed to use compensatory beliefs to resolve conflict within their current/past routines rather than to justify and plan future action.

2.4.1.1. "Little Green Lies": Endorsing CGBs despite doubting their efficacy

While participants in Study 1 did recognise – and in some cases endorse – CGBs, they also had doubts regarding the overall efficacy of compensatory actions. This concern arose principally from the complexity of calculating whether or to what extent one action would actually compensate for the negative effects of another action:

> I mean, it depends really […] if you don't drive a car can you go abroad on holiday? You know, does it compensate? It depends where you're going, how many times you're flying per year and how many times you're using the car. It's, kind of, a grey area question. (P40, male, 22-34 years)

This finding was also supported by evidence from the think-aloud exercise, which suggested that participants found it difficult to assess the comparative impact of different activities, particularly when these were in different domains (e.g., saving water to permit energy use). Indeed, in some cases, participants found the compensations outlined within the CGB-scale items to be obscure and/or illogical:

> I would never have put those two together [*Flying abroad can be made up for by being a vegetarian*]. (P08, female, 65 years or above).

Participants were also found to exploit their uncertainty surrounding the environmental impact of different behaviours in order to justify engaging in the most personally beneficial one (see also: Johnson & Levin, 2009; Pieters, Bijmolt, Van Raaij, & de Kruijk, 1998; Thøgersen & Crompton, 2009). For example, one participant acknowledged that she found it convenient to think that using a dishwasher was more energy and water efficient than washing by hand, although at the same time she questioned whether or not this was true:

> We have got quite a small dishwasher it's a really slim one and I've read things that say "dishwashers use less water than washing up by hand" and so I kind of justify it in my head by saying "oh well, I'm at least using maybe the same amount of water". But in the back of my head I think it's this big piece of equipment that's doing my dishes for me so I think I'm just trying to convince myself as it's easier. (P10, female, 22-34 years)

2.4.1.2. Moral Objections

Some participants disagreed with the notion of behavioural compensation outright, feeling that any attempt to balance environmental impacts would limit their progress towards living more sustainably. These participants argued that, wherever possible, people should act pro-environmentally and not make compromises:

> I don't think we can afford to be doing all this compensation […] I think we are just going to have to accept that we are going to have to live different kinds of lifestyles and that we may just not be able to do things that we now do. (P06, female, 65 years or above)

> at the end of the day the point is to save the environment and […] not to compensate. (P19, male, 17-18 years)

2.4.2. Why and how do people use compensatory green beliefs?

There was evidence that holding and endorsing compensatory beliefs had psychological benefits for participants. By being able to license their negative environmental impacts by, for example, drawing attention to their general green credentials, participants felt able to reduce feelings of negative affect (e.g., guilt) and feel more positive about their overall impact on the environment:

> I suppose that my biggest sin is car driving […] I do endeavour to recycle. I do endeavour to switch off appliances as much as I can, not use appliances when I don't need to, those kinds of things. I'm pretty sure that it doesn't compensate for the more extreme damage that, potentially, a car does to the environment by doing what I do. I sort of think: 'at least I am doing this.' (P25, male, 45-54 years)

> I found that one of the supermarkets was doing carrier bag recycling and I took them down to recycle and I thought 'well that's kind of made up for it a little bit'. I just think I feel better myself for doing it. (P10, female, 22-34 years)

Both these examples show that participants are aware of their negative impact on the environment, with one participant even using moral language to demonstrate his understanding (i.e., 'my biggest sin'). However, phrases such as 'at least I am doing this' indicate a tokenistic or perfunctory gesture towards acting pro-environmentally perhaps indicating that participants are unwilling to invest much effort in compensating but rather use CGBs as a momentary and immediate means of resolving the dilemma.

Being able to justify undertaking actions that have a negative impact on the environment was also deemed to be socially useful, enabling participants to emphasise their green credentials even where evidence for their pro-environmental behaviours was ambiguous:

> If I'm put on the spot and if I was being interrogated about: 'how much are you contributing?' I'd inevitably drift into self-justification-style language. (P13, male, 45-54 years)

Participants recognised that pro-environmental behaviours were morally and socially normative:

> If you deliberately said "oh I'm allowed to behave in an un-environmentally friendly way" – there's probably a lot of stigma around that. (P01, male, 22-34 years)

> I think today most people would want to be seen as being concerned […] I think we would all try to make ourselves sound better in one respect by [citing] some of the things that we do that we believe to be, you know, beneficial to the environment. (P24, female, 35-44 years)

This may go some way toward explaining why people use or endorse compensatory beliefs; potentially they serve a communicative function explaining or justifying to others the performance of potentially stigmatizing behaviour.

2.4.3. When are people likely to use compensatory green beliefs?

There was evidence in both the think-aloud exercise and the interviews that participants viewed compensation between certain behaviours as socially and morally permissible (e.g., eating in season produce compensating for the impacts of eating out of season produce) but also that they rejected the idea of compensation between other behaviours (e.g., driving less to compensate for drinking bottled water). Whether compensation was deemed to be allowable seemed to relate to the *perceived morality* and *ease* of performing certain pro-environmental actions. In short, some environmental behaviours (e.g., recycling or preventing waste) appear to be viewed as moral behaviours with the result that people's attitudes tend to relate to their moral beliefs about the behaviour (i.e., what is 'right'), as opposed to a personal calculation of the relative costs and benefits of engaging in the behaviour (Thøgersen, 1996):

> I see no reason why people wouldn't recycle because all the facilities are available. I think if there's nothing blocking you doing it, then you do have that moral obligation to do it. (P36, female, 22-34 years)

Some participants were also unwilling (at least publicly) to entertain the idea that any trade-off or compensation could be justified for relatively simple pro-environmental actions such as sorting waste for recycling (Bamberg & Möser, 2007; Frank, 1988;

Thøgersen, 1996). In essence, where undertaking a pro-environmental activity was seen to be easy, participants felt that justifying inaction or compensation was difficult to excuse. Endorsing notions of compensation seemed easier when (i) acting more pro-environmentally was deemed to be either difficult or personally costly or (ii) where acting in an environmentally detrimental way was seen as unavoidable:

> I do think there are occasions when you need to get to a place and it's out of the way and you can only really drive a car to that place […] then you would maybe think of trying to lower it down [car use] and balance it out by using less on other occasions. (P03, female, age 22-34)

> If it's unavoidable, at least you can help [by compensating]. (P25, male, 45-54 years)

2.4.4. Other varieties of justification

In addition to compensatory beliefs, participants also expressed a number of other (non-compensatory) justifications for engaging in less pro-environmental actions many of which will be familiar to the reader of Chapter 1. These included: (i) the difficulty or impracticality of the pro-environmental option (e.g., as found by Gifford, 2011); (ii) a lack of perceived and actual behavioural control (e.g., as emphasised by the theories of Reasoned Action and Planned Behaviour) (iii) that personal actions are relatively insignificant and, therefore, will not have much impact on the environment (see Gifford, 2011); and (iv) that indulgent behaviour is deserved (see Taylor, Webb, & Sheeran, 2014). For example, in circumstances where acting morally or pro-environmentally was deemed to be difficult or impractical, participants drew attention to *circumstances* that prevented their pro-environmental action or to other more important goals – such as the needs of family members – which necessitated and hence justified acting in less environmentally desirable ways:

> I need to have a car, my very elderly mother is now on her own and I need to be a phone call away from her which means I need to be literally five minutes away from her. I haven't got time to be waiting for a bus. (P37, female, 35-44 years)

Sometimes, participants appeared to take a fatalistic view arguing that nothing could really be done to remediate certain environmental impacts. This type of response has been identified in a number of studies (e.g., Gifford, 2011; Lorenzoni, Nicholson-Cole,

& Whitmarsh, 2007) and seems to stem from a lack of *self-efficacy* which in turn demotivates pro-environmental action. For example, one participant argued that attempting to compensate for a return flight to Australia would be a pointless gesture because even off-setting a short flight was relatively unfeasible:

> I do know from my carbon output charts […] that just one short European flight ─ the amount of carbon that it bangs on that month is huge, so no you can't really compensate. (P05, male, 65 years or above)

Some participants felt helpless due to the *global scale of environmental problems* and saw their own actions as a "drop in the ocean" (see Lorenzoni et al., 2007). Focusing on the scale of issues and the negative environmental impacts caused by others seemed to help participants to maintain their own sense of personal moral value and minimise feelings of guilt and personal responsibility (see also discussions by Gifford, 2011; Rothschild, Landau, Sullivan, & Keefer, 2012):

> [With] countries like China doing whatever they want - whether you've got an efficient appliance in your house isn't really going to make such a difference. (P27, female, 34-44 years).

Finally, some behaviours were seen as *highly desirable* and participants felt deserving or even entitled to participate in them. In such cases no justifications for indulging were deemed necessary, for example:

> Flying on holiday is something that if you want to go far enough and that's something that you have to do you shouldn't have to balance stuff out in order to do that. (P10, female, 22-34 years)

In short, while participants commented that it was unacceptable to not undertake low cost behaviours (e.g., recycling), they expected – or even felt entitled – to be able to undertake behaviours such as foreign travel that potentially have a larger negative environmental impact. This finding was further supported by evidence from the think-aloud exercise where justifications based on feelings of entitlement or on the perceived 'need for a treat' emerged:

> Sometimes I think it's unavoidable (no of course it would be avoidable) but I want to treat myself to certain things that are not locally produced, for example,

having Navel oranges in January and February when they're at their best but are obviously not grown in the UK at that time of year. (P24, female, 35-44 years)

2.5. General Discussion

Study 1 used a qualitative exploratory and open-ended approach to explore how people think and feel when they act, or anticipate acting, in a way that is detrimental to the environment. In particular, the research aimed to translate notions of compensation that have been extensively researched with respect to health behaviours in order to investigate whether, when, why and how such beliefs are held or acted upon in relation to environmentally-significant behaviours. The 'Compensatory Green Beliefs' (CGB) scale (see Kaklamanou et al., 2015) was used as a stimulus for discussion, and participants were asked to respond to the scale while simultaneously articulating their thoughts. This was followed by a semi-structured interview that served to further explore themes of compensation in relation to environmental action. This final section of the chapter explores overarching themes that emerged from the research and provides recommendations for future work in this area.

2.5.1. Evidence of compensatory green beliefs

Study 1 found evidence that people did entertain the prospect of environmental compensation and, specifically, the belief that an environmentally preferable action might (to some extent) compensate for a less environmentally preferable one. However, the nature and expression of these beliefs differed slightly from the statements included in the scale designed to measure CGBs developed by Kaklamanou et al. (2015). Notwithstanding some confusion about, and disagreement with, some of the compensatory couplings in the scale (e.g., whether gas use could be off-set by conserving water), the compensatory beliefs described by participants in Study 1 tended to be more holistic and cumulative in nature, with people seemingly drawing on a generic bank of relatively habitual and ongoing environmental behaviours in order to justify their less pro-environmental actions. This contrasts with the specific, rigid combinations of actions pitted against one another in the Kaklamanou et al.'s scale (e.g., that recycling compensates for driving a car). In sum, it is possible that the relatively low level of endorsement of CGBs in Kaklamanou et al.'s study (and possibly also Bratt's 1999, work) was not due to the absence of notions of environmental

compensation, but rather due to the rigidity and simplicity of the behavioural couplings used within the scale.

2.5.2. Occurrence of, and reasons for, compensatory green beliefs

Study 1 found that use of CGBs was associated with: (a) the desirability of the behaviour in question, (b) the relative ease or difficulty of acting pro-environmentally, (c) moral and social norms associated with the behaviour, and (d) the relative availability and/or suitability of other types of justification. There were a number of instances, for example, where compensation was not required because the behaviour could be more easily justified in other ways. This seemed to be the case with air travel where the behaviour was either seen as so desirable or deserved that compensation was deemed to be redundant or as having such a large impact on the environment that attempts to compensate would be futile (i.e., that inaction could be justified) (Gifford, 2011). In these cases, the desirability of the action or a lack of self-efficacy meant that compensatory beliefs were not generated (as predicted in the compensatory health belief model by Rabiau, Knäuper, & Miquelon, 2006).

While participants found it difficult to justify not engaging in relatively low cost pro-environmental behaviours (e.g., recycling), they found it easier to justify not acting pro-environmentally when so doing would incur a high cost (e.g., in terms of the time or effort involved in taking public transport as opposed to the car) (Thøgersen & Crompton, 2009). This finding is in line with previous research into environmental behaviour which has found that moral and normative frameworks appear successful in explaining low-cost pro-environmental actions but are far less effective in explaining high-cost environmental actions (see discussion by Steg & Vlek, 2009). In short participants did not feel that compensation was socially or morally acceptable in the case of behaviours which were easy to undertake but did employ compensation and other justifications in the case of higher cost but also more environmentally important behaviours.

Study 1 suggests that CGBs are related to the phenomenon of moral licensing (for an overview of moral licensing see, Miller & Effron, 2010). In short, by thinking that one

action can compensate (at least to some extent)[9] for another, participants were able to license actions which they knew were environmentally detrimental. This connection between compensation and licensing is to be expected insofar as many pro-environmental actions are also viewed as moral or altruistic actions (e.g., Lindenberg & Steg, 2013; Thøgersen, 1996).

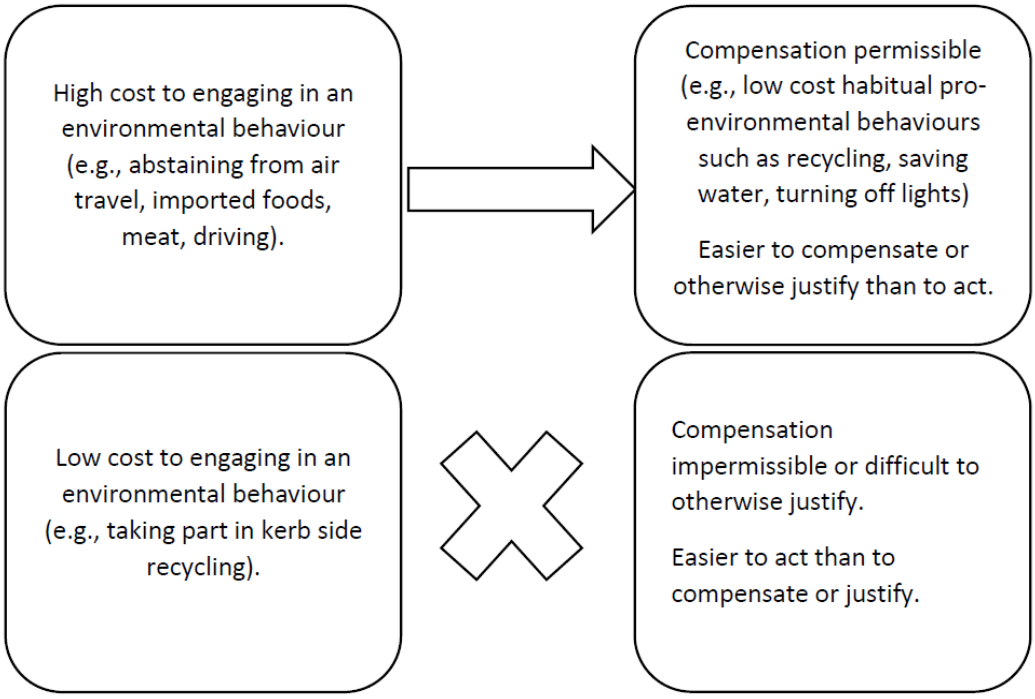


Figure 3: A summary of participants' views on when compensation is acceptable

Research on psychological licensing describes two construals of actions which may facilitate licensing. First, actions may be construed as providing "moral credits", whereby an individual who has just acted morally (e.g., donated to charity) will subsequently feel licensed to act less morally and vice versa. In support of this idea, Study 1 found that participants argued that their habitual pro-environmental behaviours balanced out or off-set their habitual less pro-environmental behaviours. In other words, participants felt that their "good behaviours" accrued some form of moral currency which could be spent on environmentally detrimental but otherwise enjoyable or convenient behaviours (e.g., driving) (see, Sachdeva, Iliev, & Medin, 2009). Relatedly, the tokenistic responses described by some participants (i.e., that full compensation was

[9] It is important to note that while some employed compensatory beliefs they also expressed significant doubts about their efficacy (see section: 2.4.1.1, p. 43). This indicates a tokenistic approach towards acting pro-environmentally rather than a real willingness to invest effort in environmental behaviour.

not possible but was better than not compensating at all) could be seen as a "credit card" strategy whereby participants felt that they could act in an environmentally detrimental manner despite not being able to afford to pay off the debt at present.

The second construal of actions that may facilitate licensing focuses on the idea of credentials. For example, donating to charity may enable someone to construe their subsequent refusal to donate to another charity as not ungenerous. In other words, previous actions may provide a lens by which people interpret their subsequent actions. Similarly, being able to draw attention to their pro-environmental behaviours seemed to enable participants to feel that they would be more favourably judged by others. Miller and Effron (2010) argue that the two accounts are not mutually exclusive but may be viewed as independent routes to moral licensing. Insofar as holding the belief that some actions can compensate for other actions, compensatory beliefs may facilitate licensing.

Participants in Study 1 expressed concern that CGBs may be exploited by individuals who want to look or feel green but who are not yet ready to pay the price of actually acting pro-environmentally (also see, Beattie, 2010 on "green fakers"). In light of the general and cumulative nature of the CGBs expressed by our participants this would seem to be a valid concern. Such general beliefs could constitute a form of 'lazy accounting', which allows individuals to appear (to themselves and to others) to be in possession of significant green credentials but without having to make significant changes to their lifestyles. However, while CGBs may be used by individuals to defend their moral character (i.e., as a green and altruistic person) their use may also carry the risk of appearing duplicitous or hypocritical. For example, Kaklamanou et al. (2015, p. 10) found a small but statistically significant negative correlation between the endorsement of CGBs and scores on a social desirability scale. This suggests that participants may have been reluctant to admit to endorsing CGBs because doing so may make them appear less pro-environmental to others (i.e., potentially lowering their social desirability).

2.5.3. Recommendations for improving the measurement of the compensatory green belief scale

The think aloud protocol employed in Study 1 provided a number of insights into how participants responded to the CGB scale developed by Kaklamanou et al. (2015) that might be used to improve questionnaire measures of CGBs in future research.

Responding to statements describing CGBs where the compensation is in a different domain to the environmentally damaging action appeared to require a degree of environmental literacy[10] and participants without the required knowledge found it difficult to see the connection between the different domains. Such statements could be re-worded in order to provide the requisite information (e.g., "Not eating meat reduces carbon emissions and can thus make up for those generated by flying abroad").

Alternatively, compensatory beliefs may be better measured using statements that are domain specific (e.g. comparing different forms of transport). Data from the studies by Bratt (1999) and Kaklamanou (2015), for example, suggest that the compensatory items which trade off two behaviours within the same domain generally appear to receive stronger endorsement than trade-offs that are in different domains (e.g., driving and recycling). Furthermore, an unpublished study by Kaminska, Byrka, and Jeziorowska (2013)[11] also showed the strongest endorsement of compensation when both behaviours belonged to the same cognitive category.

To summarise, promising strategies to improve future questionnaire measures of CGBs include: a) making the connections between item components explicit and b) ensuring that the compensatory behaviour is within the same behavioural domain as the environmentally detrimental behaviour.

The definitive way in which some of the compensations were described in Kaklamanou et al.'s scale also seemed to caused participants difficulties. There seemed to be two main reasons for this. First, certain behaviours appeared to be viewed as moral norms (e.g., recycling) and for this reason some participants seemed unwilling to consider (at least publically) the possibility of making a trade-off. Second, participants often wanted to qualify their responses – outlining, for example, in what circumstances and how frequently the described compensation would be acceptable. Taking into account the finding that mixed domain and definitive compensations were more challenging for

[10] Environmental literacy can be broadly defined as "the capacity to perceive and interpret the relative health of environmental systems and to take appropriate action to maintain, restore, or improve the health of those systems" (Roth, 1992, p. 17).

[11] Since the completion of the present doctoral research into CGBs, the work by Kaminska et al. (2013) has been further developed and published (see, Byrka & Kaminska, 2015). Their findings confirm that participants are more willing to endorse compensatory statements in which the compensatory behaviour belongs to the same domain as the environmentally detrimental behaviour and where the compensatory behaviour is the easier option. Conversely, the lowest level of endorsement was found when the behaviours were in different domains.

participants there is a case for: a) changing response options from the extent of agreement to a more frequency based scale (i.e., "How often is it okay to compensate?") and/or b) changing the nature of the measure to allow for an open response (e.g., "Driving could be compensated for by X"). This latter method has been tested in a series of studies in Poland with some success (Byrka & Kaminska, 2015; Kaminska, Byrka, & Jeziorowska, 2013).

2.6.Limitations

It is worth noting a number of limitations with Study 1. First, the sample size is a potential issue. To the author's knowledge there is no recommended sample size for studies employing a think-aloud methodology and because a new measure (i.e., the CGB scale) was being tested it was not possible to anticipate the exact point of theoretical saturation (Gardner & Tang, 2014). Nonetheless, a sample size of 40 is relatively common for think-aloud exercises and in combination with the data from the semi-structured interviews the resulting data was very rich, allowing for an in-depth exploration of participants' perceptions of and reactions to CGBs. Therefore, while the sample size is relatively small compared to quantitative studies (e.g., studies that use a questionnaire to measure CGBs, such as Kaklamanou et al., 2015) and caution is required when making generalizations from the data, the findings may be described as 'transferable,' – that is they may be applied where similar people or situations exist (Maxwell, 2009; Yardley, 2000). Furthermore, the qualitative paradigm drew attention to the limitations of questionnaire-based measures of CGBs, and suggested that they may not be the best way to study notions of compensation in relation to environmentally-significant behaviours.

A second and related issue is that a convenience sample was used. Staff and students at the University of Sheffield in addition to local community groups and schools were invited to participate in the study. It can be observed that some participants have a relatively high level of education and/or level of environmental awareness (e.g., having calculated their personal carbon emissions). While this is a clear limitation, the sample nonetheless captures a range of different perspectives and beliefs about pro-environmental behaviours as well as justifications for engaging in environmentally detrimental behaviours.

Third, the study relied on self-report. Concurrent think-aloud protocols are seen as preferable to retrospective think-aloud protocols because any difficulties participants' experience in completing the task are recorded simultaneously with questionnaire completion (rather than relying on participants being able to recall and explain any difficulties after completing the task) (Trickett, 2009). However, concurrent think aloud protocols do not allow the researcher to ask the participant any questions (Trickett, 2009). The present research overcame this limitation via the use of semi-structured interviews after the think-aloud task. Nonetheless, to the extent that both methods require self-report rather than objective measures of behaviour it is possible that the ability of participants to recall particular occurrences may have been limited by, for example, their distance in time (Nisbett & DeCamp Wilson, 1977).

2.7. Conclusion

Study 1 makes a number of contributions to the understanding of compensatory beliefs concerning environmentally significant behaviours. First, evidence was found regarding whether, when, why and how CGBs occur. Specifically, the findings suggest that CGBs are triggered when people feel the need to justify their pro-environmental credentials to themselves (e.g., to reduce guilt) or to others and when justifications involving compensation will not incur social sanctions (e.g., because they conflict with norms). Second, the findings point to the similarities and differences between compensatory beliefs in health and environmental domains. Specifically, the findings suggest that CGBs, like compensatory health beliefs, appear to be associated with dissonance and situations involving goal conflict. However, while CGBs are in some respects reminiscent of the personal licensing that occurs within health behaviours, they also appear to have an additional moral dimension – bearing a close resemblance to moral licencing where individuals work to demonstrate their moral character to themselves or to others. Finally, the present findings suggest that current measures of CGBs may not adequately capture the extent to which people endorse CGBs and provide a number of specific suggestions by which subsequent measures might be improved. The next chapter will further explore the potential relationship between environmental guilt and compensation.

3. Chapter 3 – Exploring the relationship between guilt and compensation

3.1. Study 2 context

The present research (Study 2) into the role of guilt in compensation follows on from Study 1 which used qualitative methods to investigate whether and in what circumstances compensatory green beliefs (CGBs) may be used. Study 1 found that participants did hold and endorse compensatory beliefs about some environmentally significant behaviours. Furthermore, the research suggested that just as with compensatory health beliefs (CHBs), CGBs have an apparent function in dissonance resolution. In short, CGBs seemed to be important in resolving guilt by providing a justification for environmentally detrimental but otherwise desirable actions (e.g., car use).

In Study 1 participants argued that previous or on-going pro-environmental behaviours (as opposed to future behaviours that they intended to undertake) compensated for the ways in which they harmed the environment. In other words, participants principally endorsed retrospective compensatory beliefs. For example, participants argued that their habitual more pro-environmental behaviours such as recycling or walking to work could compensate for the environmental damage caused by their less pro-environmental behaviours (e.g., eating imported foods). While it is possible that this finding results from the nature of the exercise (i.e., self-reflection), it could also suggest a potential difference in emphasis between compensatory health beliefs and compensatory green beliefs in terms of intention formation. Such a difference could result, for example, from the fact that health behaviours tend to have direct personal consequences (Nisbet & Gick, 2008). Take the case of the dieter who repeatedly eats cake. This person is unlikely to lose weight unless he/she does actually plan and follow through with a compensatory behaviour (e.g., more exercise). In contrast, the person who succumbs to a delicious beef steak, despite being aware that eating it runs counter to their carbon reduction goal, is unlikely to suffer any personal or immediate repercussions resulting from this behaviour. Arguably, as a result such a person may be less motivated to plan and undertake a compensatory action. In short, a lack of personal consequences coupled with the fact that the outcomes of pro-environmental behaviours may be somewhat uncertain, may mean that people may have a tendency to resolve feelings of

environmental guilt by employing retrospective compensations (i.e., reflecting on past pro-environmental behaviours). Additionally, Study 1 highlighted that CGBs had a social function in terms of reputation management. Participants may have focused on past pro-environmental behaviours because providing concrete evidence of one's green credentials may be more effective in social situations than simply expressing an intention to "do better" in future.

Study 1 provided evidence that participants did use CGBs and that CGBs had a role in dissonance resolution. However, it was uncertain whether dissonance resolution was achieved cognitively or whether participants would in fact be motivated to undertake a compensatory action. Study 2, therefore, further investigated the relationship between compensation, guilt, intention and behaviour using experimental methods.

3.2.Study 2

Compensatory beliefs are generated when people want to pursue desires (e.g., for air travel) that compete with other goals (e.g., reducing personal carbon emissions) and, therefore, feel a need to resolve uncomfortable feelings of dissonance such as guilt, (Rabiau, Knäuper, & Miquelon, 2006). In order to create feelings of guilt participants in Study 2 were randomly assigned to a guilt condition where they were asked to reflect on how their own lifestyles had caused environmental harm. As guilt is a "pro-social" emotion that tends to result in feelings of obligation to undertake a reparative (i.e., compensatory) act, it was expected that these participants would form stronger intentions to be more pro-environmental in future relative to the other conditions (Bamberg & Möser, 2007; Baumeister, 1998). Following on from Study 1, Study 2 also investigated how reflecting on past pro-environmental behaviours might influence compensatory intentions. A number of participants were, therefore, randomly assigned to a pride condition where they were asked to reflect on how their lifestyles had helped or benefitted the environment in some way. It was anticipated that participants in the pride condition would feel that that their past pro-environmental behaviours licensed them to relax in pursuit of environmental goals (i.e., because their previous pro-environmental behaviours would compensate for their current lapse) (Miller & Effron, 2010).

The study focused on pride and guilt because these are emotions which are seen to result from an evaluation of a person's own behaviour – something which people are

likely to take into account when deciding whether a goal incongruent (or indulgent) behaviour can be licensed (Vining & Ebreo, 2002). It should be noted that the study specifically aimed to manipulate feelings of guilt rather than shame. Whereas guilt has been found to prompt reparative or compensatory action, shame tends to lead to withdrawal and unresolved negative affect (Giner-Sorolla, Kamau, & Castano, 2010).

To summarise, it was predicted that participants who felt environmental guilt would be motivated to compensate as measured by: a) forming an intention to do more to help the environment and b) by pledging more hours to helping conserve the environment (volunteering) than participants who had reflected on how their lifestyles had helped the environment. The effects of these manipulations were compared to a control condition, in which participants were not asked to reflect on their environmental behaviour. Finally, the study investigated to what extent feelings of pride and guilt would predict: a) intention and b) pledged behaviour (volunteering).

3.3.Method

3.3.1. Participants

The initial sample included 350 participants who were University of Sheffield staff members who had subscribed to a volunteer mailing list. From the original sample, data were excluded from 27 participants because they did not actually answer any questions. Data from a further 78 participants were removed because these participants did not follow the experimental protocol (e.g., did not reflect on their environmental behaviour). The final sample included 245 participants. Of those participants who provided demographic data, 75 (30.06%) were male and 162 (66.01%) were female. The majority of participants were aged between 18 - 34 years (n = 101, 41.02%) (Range 18 - 65 plus).

3.3.2. Procedure and materials

The current research was conducted online using Qualtrics survey software.[12] A link to the survey experiment was contained in the email distributed to participants. In order to avoid recruiting participants with a particular interest in the environment who may have

[12] For more information about Qualtrics please see: http://www.qualtrics.com/

relatively strong green identities, the study was advertised as relating to "lifestyle and wellbeing". Furthermore, by concealing the true purpose of the study it was hoped that the study would avoid receiving socially desirable responses. Participants were offered the opportunity to enter a prize draw for a £20 Amazon voucher.

Green Identity: The first question seen by participants was the 4-item measure of green identity (Whitmarsh & O'Neill, 2010) used in Study 1 (e.g., I think of myself as an environmentally friendly consumer). However, in order to disguise the environmental focus of the study, the green identity scale was embedded among distractor items on health (e.g., I think of myself as someone who eats healthily). Responses were recorded using a 5-point Likert scale with neither agree nor disagree as the midpoint. Scores on the green identity scale were internally consistent (Cronbach's α = .77). The full scale including distractor items, can be seen in Appendix Two: Materials for Study 2.

Reflective Exercise: After responding to the green identity scale, participants were randomly allocated to one of three conditions. In the two experimental conditions, participants were either asked how their lifestyle had: 1) helped (pride condition) or 2) harmed (guilt condition) the environment and how this made them feel. Insofar as individuals are likely to differ with respect to which environmentally significant behaviours they undertake and which evoke feelings of pride of guilt, this manipulation took the form of a reflective exercise where participants were free to choose which behaviours they focused upon. The control condition were not invited to participate in a reflective exercise. The instructions for the reflective exercise are presented below:

> We would like to ask you about how you think and behave in relation to the environment. Almost everything we do impacts the environment in some way. For example, the products we buy and the way we travel. In the present research, we are interested in finding out more about the behaviours that people engage in that have a **[negative impact / positive impact]** on the environment. Please think about how **[your lifestyle has harmed / helped]** the environment in some way. Please write a description of what you are thinking about in the box below. You may want to think about the following: What did you do? Where and when did this happen? How did you feel? Please spend some time on this, as we are looking for details of the kinds of behaviours that **[harm / help]** the environment.

Measuring Affect: To assess the effectiveness of the manipulation, the Positive and Negative Affect Schedule (PANAS) was used (Watson, Clark, & Telleger, 1988). The PANAS is formed from two scales, one that measures positive affect and the other which measures negative affect. Participants are asked to indicate the extent to which they feel a range of emotions at the present moment using a 5-point scale. The response options are: 1) very slightly or not at all, 2) a little, 3) moderately, 4) quite a bit and 5) extremely. Twenty emotions are listed (e.g., Guilty, Proud, Interested and Excited). The focal emotions for this study were pride and guilt.

Measuring Intention: Following the PANAS, all participants were asked to rate the extent to which the following statement was true for them: "I intend to do more to help the environment" (7-point Likert scale anchored by "very untrue of me" and "very true of me"). The scale midpoint was labelled as "neutral". Again the question was presented with distractor items on health (e.g., I intend to take more exercise). The purpose of the distractor items was to make the environmental focus of the study less obvious to participants. The full scale including distractor items can be seen in Appendix Two: Materials for Study 2.

Social Desirability: Participants were also presented with the short form of the Marlowe-Crowne Social desirability scale (Cronbach's α = .70) (Ray, 1984). Items included: "Do you sometimes try to get even rather than forgive and forget?" Participants responded using "true", "false" and "don't know" response options. Responses were summed with higher values indicating a need for greater social approval.

Demographics: Participants were asked to provide basic demographic information (e.g., sex and age).

Volunteering: Next, participants were told that the questionnaire was complete and thanked for taking part. The remaining dependent variables were presented as a separate questionnaire, purportedly from the University of Sheffield, regarding volunteering opportunities. As participants were reached via the staff volunteer mailing list it was felt that the main purpose of the study would, therefore, be concealed preventing bias in responses. The information and questions as presented to participants are shown in Figure 4: Screen Shot of Survey (below).

Thank you for taking part in this study. Your contribution is greatly appreciated.

The University of Sheffield and Sheffield Students Union are working to support staff and students in volunteering with local charities.

In an effort to increase awareness of volunteering opportunities, we have taken the opportunity to show research volunteers some of the other volunteering opportunities available to them. Please take a moment to read the information below.

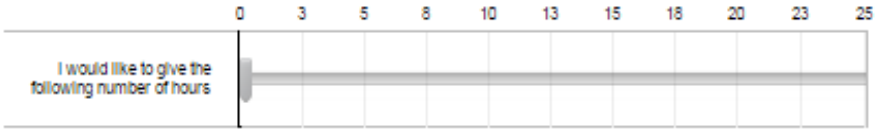
We would like to gauge your interest in volunteering with the following local conservation charity:

Sheffield Wildlife Trust
"Whether it's practical conservation on our nature reserves, helping organise environmental education events or working in our offices, volunteers are vital to our work. Our aim is to work alongside local people to protect and enhance the environment of Sheffield and Rotherham. The Wildlife Trust for Sheffield and Rotherham is one of 47 Wildlife Trusts working to make the United Kingdom a better place for people and wildlife."

Are you interested in finding out more about volunteering opportunities with Sheffield Wildlife Trust?

- Yes
- No

If you are interested in volunteering please indicate how many hours you would be able to give over the next 12 months



Please send me further information about volunteering opportunities with Sheffield Wildlife Trust.

Name:

Email Address:

I already support the Wildlife Trust (e.g. member)

- Yes
- No
- Unsure

I am involved with other environmentally focused charities (e.g. The Woodland Trust)

- Yes
- No
- Unsure

Figure 4: Screen Shot of Survey

Participants were given information about volunteering opportunities with a local wildlife trust and asked to indicate their interest in taking part ("yes"/"no" measure). Interested participants were invited to state how many hours they would be able to volunteer (0-25 hours) and to provide their name and email if they wished to receive further information about volunteering opportunities with that particular wildlife organisation. Finally, participants were asked if they were already a member of the wildlife or other environmentally focused organisation. The debrief which explains the deception used in this study can be found in Appendix Two: Materials for Study 2.

3.4. Results

3.4.1. Randomisation check

There were 106 participants in the control condition, 67 in the pride condition and 72 in the guilt condition. A one way between subjects ANOVA was conducted to check that levels of green identity did not differ between conditions. No difference in the green identity scores for each condition was found, $F(2, 242) = 1.43$, $p = .242$, $\eta_p^2 = 0.12$, indicating that participants were evenly distributed. Randomisation on the basis of green identity was deemed to be effective. The three conditions did not differ significantly in terms of social desirability ($p = .127$) or sex ($p = .234$). Age was measured in categories as follows: 18 - 34 years, 35 - 54 years and 55 - 65 and above years. A Chi-square test for independence indicated that participants in each condition did not differ significantly in terms of age, χ^2 (4, $N = 231$) = 5.57, $p = .234$. Within the control condition 40 (38.5%) were aged 18-34 years, 47 (45.02%) were aged 35-54 years and 17 (16.03%) were aged 55-65+ years. Within the pride condition 26 (40.6%) were aged 18-34 years, 30 (46.09%) 35-54 years and 8 (12.05%) 55-65+ years. Finally, within the guilt condition 35 (55.6%) were aged 18-34 years, 20 (31.07%) 35-54 years and 8 (12.07) 55-65+ years. Table 3-1 provides the means and standard deviations.

Table 3-1: Descriptive Statistics by condition

	Control			Pride			Guilt		
Variable	N	M	SD	N	M	SD	N	M	SD
Guilt	106	1.45	.91	65	1.38	.76	69	1.70	.91
Pride	106	2.58	1.22	65	2.25	1.16	69	2.43	1.14
Intention	105	4.65	1.19	65	4.23	1.44	67	4.96	1.01
Green ID	106	15.07	2.18	67	14.43	2.65	72	14.94	2.66
Social Des.	105	17.70	3.99	65	17.72	4.05	67	16.53	4.11

3.4.2. Manipulation check: reflective exercise

In Study 1, it was found that people provided a range of justifications for their less pro-environmental behaviours. For this reason, the decision was made to check the extent to which participants had followed the experimental protocol. Responses were coded as follows: 1 = followed protocol and 2 = protocol not strictly adhered to. Participants in the guilt condition were counted as not strictly following the protocol if they justified their behaviour (e.g., difficulty of acting pro-environmentally) or went beyond the protocol by listing pro-environmental behaviours that they were undertaking or planned to undertake. A number of instances were found where participants in the guilt condition offered justifications or went beyond the protocol and then explicitly wrote that they did not feel guilty for harming the environment, suggesting the manipulation had been weakened. Similarly, some participants in the pride condition went beyond the brief by providing reflections on how they felt they could be doing far more to help the environment. In both conditions it was deemed that the manipulation was not having the desired effect for such participants and these participants were, therefore, coded as not conforming to the protocol. Over both conditions 47.1% were found to not conform to the protocol. It was found that 47 (65.3%) participants in the guilt condition did not strictly follow the protocol while 25 (34.7%) did as instructed. In the pride condition, 16 participants (23.9%) did not follow the protocol while 51 (76.1%) did as instructed.

3.4.3. Guilt and pride manipulation check

The results presented in this chapter include all participants, including those who did not strictly adhere to the experimental protocol. However, a number of statistical tests were repeated using only participants who had strictly adhered to the experimental protocol. There was no qualitative difference in results. Please refer to Appendix Two – Study 2 to see these additional analyses. It had been predicted that participants in the *guilt condition* who had reflected on how their lifestyles had harmed the environment would report higher levels of guilt. A one-way between groups ANOVA was, therefore, conducted to investigate whether guilt scores as measured by the PANAS scale would differ significantly between the pride, guilt and control conditions. There was, however, no significant difference in guilt scores between the three conditions, $F(2, 237) = 2.46$, $p = .088$. It had also been predicted that participants in the *pride condition* would report the highest level of pride. However, a one way between subjects ANOVA showed the

relationship between condition and reported level of pride to not be statistically significant, $F(2, 237) = 1.56$, $p = .212$. The manipulation check (presented above) found that a large proportion of participants had not adhered to the experimental protocol. These findings further suggest that the effectiveness of the manipulation was compromised. Finally, general differences in positive and negative affect as assessed by the PANAS scale were also checked. No significant differences were found with respect to general negative ($p = .141$) or positive affect ($p = .368$).

3.4.4. Intentions to do more to help the environment

It had been predicted that participants who reflected on their negative environmental impacts would report higher intentions to "do more to help the environment" in order to compensate. In contrast, participants who had reflected on their pro-environmental behaviours were expected to feel licensed to relax in pursuit of this goal as shown by lower intentions to help the environment. To investigate this hypothesis, a one-way between-groups ANOVA was conducted to explore the impact of experimental condition (pride, guilt, control) on levels of environmental intention. The assumption of homogeneity of variance was violated. For this reason the Brown-Forsythe F-ratio is reported. There was a statistically significant difference at the < .05 level in intention scores for the three conditions, $F(2, 183.81) = 5.78$, $p = .004$, $\eta_p^2 = .05$. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for the *guilt* condition ($M = 4.96$, $SD = 1.01$) was significantly different to the *pride* condition ($M = 4.23$, $SD = 1.44$). The *control* condition ($M = 4.65$, $SD = 1.19$) did not differ significantly from either the pride or guilt conditions. As predicted participants who reflected on their negative environmental impacts had stronger intentions to be pro-environmental in future than participants who had reflected on their positive impacts.

3.4.5. Volunteering

Only 31 participants (16.15%) stated interested in volunteering for the Sheffield Wildlife Trust while 192 stated they were uninterested in this opportunity. Of those participants who expressed an interest in volunteering 13 were from the guilt condition and 5 were from the pride condition. The remaining 13 were from the control condition. A Chi-square test for independence (with Yates Continuity Correction) indicated no

significant association between the two experimental conditions (pride vs. guilt) and willingness to volunteer (yes vs. no), χ^2 (1, N = 125) = 3.05, p =.081, *phi* =.18.

A total of 40 participants specified exactly many hours, if any, they would be willing to pledge to volunteering (0 - 24 hours).[13] Of these 15 were from the control condition (M = 9.53, SD = 6.21), 19 were from the guilt condition (M = 7.53, SD = 7.39) and 6 were from the pride condition (M = 8.17, SD = 7.39). A one way between participants ANOVA showed that there was no significant effect of condition (pride, guilt and control) on hours pledged, F(2, 37) = .38, p = .684.

3.4.6. Exploring the relationship between guilt and intention

Previous studies on compensatory beliefs have suggested that there is a risk that forming an intention to compensate will resolve dissonance meaning that people will not actually undertake a compensatory action. Further analyses were, therefore, conducted to: a) assess the extent to which guilt predicts intention to do more to help the environment and b) to assess the extent to which guilt predicts the number of hours volunteered (pledged behaviour).

A multiple regression was performed to predict "intention to do more to help the environment". Green identity, pride and guilt were entered into the model as predictors. The model was found to be statistically significant, F(3, 233) = 30.67, p < .001, and accounted for 27.4% of the variance, as indexed by the adjusted R^2 statistic. After controlling for other variables, guilt and green identity were significant predictors of pro-environmental intention but pride and condition were not. Higher green identity scores and reported feelings of guilt are positively related to pro-environmental intention.

It was predicted that participants who experienced higher guilt levels would be more likely to donate a greater number of hours to environmental conservation work. A linear regression using the enter method was undertaken to predict intention. The model was not statistically significant, F(3, 36) = .368, p = .777. Furthermore, all predictors entered into the model were not statistically significant. The results of the two regression

[13] The reader will notice that 31 participants stated interest in volunteering but 40 participants specified how many hours they would volunteer. This 40 includes participants who said "no" to volunteering and specified that they would give zero hours and also participants who said "no" but then volunteered to give time.

analyses suggest that green identity and guilt predict the strength of participants' intentions to be pro-environmental but do not predict the amount of time participants were willing to donate to environmental conservation.

Table 3-2: Unstandardized descriptive statistics (across all conditions)

Unstandardized descriptive statistics	N	M	SD
Intention	237	4.62	1.24
Guilt	240	1.50	.88
Pride	240	2.45	1.19
Green Identity	245	14.86	2.46

Table 3-3: Regression Table: Predicting intention to do more to help the environment

	B	SE B	β	t	Sig.	95% Confidence Interval	
						Lower	Upper
Constant	4.62	.07		67.23	<.001	4.49	4.76
Z Green ID	.60	.07	.48	8.58	<.001**	.46	.73
Z Pride	.12	.07	.09	1.66	.099	-.02	.25
Z Guilt	.22	.07	.18	3.23	.001**	.09	.36

3.5. Discussion

Study 2 aimed to manipulate feelings of guilt with the aim of investigating whether participants who felt guiltier would form stronger (i.e., compensatory) intentions to do more to help the environment. Furthermore, the study investigated whether participants who felt guilt would actually undertake a compensatory behaviour (volunteering). The findings from Study 1, for example, had suggested that there was a risk that participants would cognitively resolve their dissonance by reflecting on their past pro-environmental actions, which might, in turn disincentivise compensatory action. Interestingly, Study 2 found that participants did try and resolve their guilt by reflecting on their past pro-environmental behaviours during the reflective exercise. It was also found that participants in the guilt condition expressed significantly stronger compensatory intentions than other participants. However, these intentions did not translate into a greater willingness to volunteer. In fact, no significant differences were found between conditions with respect to volunteering. These results suggest, therefore, that guilt triggers compensation (both retrospective and prospective) but that compensatory intentions are not necessarily translated into compensatory actions resulting in an intention-behaviour gap.

3.5.1. Limitations

Two hypotheses that were not supported by the data were that: 1) participants in the guilt condition would report significantly more guilt and, 2) participants in the pride condition would report significantly more pride relative to the other conditions. As reported earlier in this chapter, however, a high number of participants in the experimental conditions were found to have not strictly adhered to the experimental protocol. It appears, in fact, that an unintentional result of the reflective exercise was that it not only provided participants with the opportunity to reflect on their negative behaviours but also gave them time to cognitively resolve their guilt. Participants in the guilt condition, for example, did not merely describe how their lifestyles had harmed the environment but also reflected on the more positive actions they had undertaken which might help to off-set or even license the damage (e.g., "The car I use is an eco-friendly car so this makes me feel better about driving rather than using public transport", Participant 145). Participants in the pride condition also went beyond the experimental remit. For example, some participants expressed dissatisfaction with their environmental performance (e.g., "I also try to reuse carrier bags but don't always – we reuse plastic carrier bags as rubbish containers which I know is bad", p.70). To the extent that participants in the pride condition felt they could do more to benefit the environment and to which participants in the guilt condition felt that they were compensating for their impacts in some way – the influence of the manipulation may have been somewhat limited.

The literature on compensatory beliefs within a health domain lead to the prediction that participants were likely to form compensatory intentions in order to resolve feelings of dissonance (e.g., environmental guilt). However, there was a concern that intention formation may not be translated into compensatory action. The data appear to support these predictions. For example, regression analyses found guilt to be a significant predictor of intention but not of pledged behaviour (volunteering), and significant differences were found between pride and guilt conditions with respect to intention but not pledged behaviour. These findings suggest, therefore, that forming a compensatory intention can cognitively resolve guilt. Nonetheless, these results should also be treated with some caution as there are alternative explanations for the findings. For example, pledging to volunteer may have been an issue for many participants. Undertaking conservation work for Sheffield Wildlife Trust would have required physical labour and

travel to site locations as well as a time commitment. Participants may not have been able to volunteer for a wide number of reasons including their state of health and overall fitness, mobility reasons or because of family or other time commitments. In short, volunteering could be seen as a difficult or costly behaviour.

Furthermore, a limitation of this study was that general intentions are poor predictors of specific behaviours (see Ajzen & Fishbein, 1977, 1980). In this study participants simply expressed a very general commitment to "do more to help the environment". The study could have been improved by making the intention and behaviour measures more closely related. For example, the measure of intention could have been to "do more to off-set personal carbon emissions" while the measure of compensatory behaviour could have been a financial donation to a carbon offsetting scheme.

3.6. Summary

The present study built on Study 1 helping to better understand the relationship between guilt and compensation within an environmental domain. Participants who reflected on the negative impacts of their lifestyles expressed significantly greater intentions to do more to help the environment in future relative to participants who reflected on how their lifestyles had benefitted the environment. Furthermore, the data suggest that compensation may be a contributing factor to the intention-behaviour gap by allowing people to resolve guilt cognitively. The measure of (pledged) compensatory behaviour was, however, a limiting factor. Volunteering was too specific (as intentions were general) and also perhaps too demanding, with very few participants volunteering time to the conservation charity. In short, a better measure of compensatory behaviour is required. Studies 3-5 which are presented in the next chapter aim to address this limitation by providing multiple opportunities to compensate.

4. Chapter 4: Looking for evidence of compensation in sequential environmentally-related decision-making

The current chapter explores the idea of compensation as a way of achieving balance between maximising pleasure and minimising harm (Rabiau et al., 2006) across a series of different scenarios. This builds on the previous chapter in the following way. The previous chapter (Chapter 3, Study 2) considered compensating and licensing effects, looking at whether participants who reflected on how they had harmed the environment would feel greater environmental guilt and, therefore, be more motivated to express (compensatory) intentions to be more pro-environmental in future and to undertake a compensatory behaviour (as measured by time pledged to volunteering). Study 2 also considered whether participants who were asked to reflect on how their lifestyles had benefitted the environment would feel licensed to relax in their pursuit of this goal as measured by their relatively lower intentions and willingness to volunteer. However, while study 2 found evidence of (compensatory) intentions, it failed to find evidence of compensatory behaviour (volunteering). There are a number of possible reasons for this, including that volunteering was considered too difficult or costly (e.g., in terms of time and effort). Consequently, whereas in Study 2 participants were offered only one opportunity to compensate, Studies 3-5 (presented in this chapter) examine how participants would behave across a series of scenarios in which they face a dilemma between doing what is pro-environmental versus doing what is easy or pleasurable.[14]

Study 3 is a quasi-experimental study that looks at whether participants display balancing behaviours across a series of 10 vignettes. After reading each vignette participants were forced to choose between a personally beneficial but environmentally costly behaviour (e.g., air travel) and an environmentally beneficial but personally costly behaviour (e.g., abstaining from air travel) – thus creating a dilemma between self-interest and pro-environmental behaviour. Because Study 3 was limited insofar as participants were not randomly allocated to conditions, Study 4, assigned participants to conditions by manipulating their first choice. In short, participants were either told to imagine that they had gone to some effort to behave pro-environmentally or that they had failed to do so. The aim was to manipulate whether participants felt themselves to

[14] This task could also be described in terms of investigating how participants managed multiple and competing goals (e.g., hedonic vs. normative goals) (Lindenberg & Steg, 2007).

be in possession of or in deficit of environmental credits at the start of the exercise. Within the literature there has been some debate regarding whether positive spillover (Thøgersen, 1999; Tucker & Douglas, 2007) *or* licensing and compensating (i.e., "flip-flopping") (Blanken et al., 2015) are more likely to occur when behaviours are conceptually similar. This was explored in Study 5 where participants were either presented with conceptually similar of dissimilar vignettes.

The design of all three studies follows those of Zhong, Lount, and Murnigham (2010) who employed vignettes to explore the ethicality of decision-making in business contexts. One important difference, however, is that while Studies 3 – 5 in this thesis used binary response options (i.e., act to benefit self vs. benefit the environment), each of Zhong et al.'s vignettes included four behavioural choices. These choices were ranked by the authors according to how much they benefitted the individual at the expense of others. The rankings were validated in a pre-test where students independently evaluated the behavioural choices, providing average (normative) ethicality ratings for each response option. In contrast, a binary response option was used in studies 3 – 5 in this thesis because behaviours on a spectrum between benefiting the individual and benefiting the environment could potentially be seen as to some extent compensatory. The implications of these differences are discussed in detail in Chapter 6: Main discussion.

While the study by Zhong et al. (2010) initially set out to see whether giving participants longer to deliberate about their decisions would result in less ethical choices, the authors actually found that decision makers appeared to be acting as if their previous choices had created or lost moral credits. In short, it appeared that participants who made a first more ethical choice went on to make a subsequent choice that was less ethical and vice versa – with the pattern repeating across the scenarios. Quite simply, the idea was that by providing participants with a series of decision-making opportunities they would be offered the opportunity not only to act in self-interest but also to work to promote a positive self-image (reputation maintenance), thus, striking a balance between pleasure and environmental harm (Rabiau et al., 2006; Zhong et al., 2010).

While the research by Rabiau et al. (2006) and Zhong et al. (2010) look at balancing in non-environmental domains there is now a growing body of evidence to suggest similar effects in relation to environmentally significant behaviours (Austin, Cox, Barnett, &

Thomas, 2011; Meijers, Noordewier, & Avramova, 2014). A study by Mazar and Zhong (2010) for example, found that participants were more likely to behave selfishly, cheat and even steal after purchasing eco-friendly products. Another example is provided by a study conducted by Sachdeva, Iliev, and Medin (2009) where participants were asked to write a short story about themselves using either nine positive, negative or neutral words. Participants were then presented with a vignette where they imagined managing a manufacturing plant that was releasing harmful pollutants into the atmosphere. The emissions could be reduced but at a cost to the profitability of the plant. Participants who had been assigned the task of writing about their positive traits were significantly more likely to prioritise the profitability of the plant at a cost to the environment – opting to run the filters only 56% of the time which was in breach of an agreement with lobbyists and other managers. In contrast, participants who focused on their negative attributes opted to run the filters 73% of the time demonstrating a "moral cleansing" effect. In other words these participants worked to reduce the threat to their moral self-image by undertaking a virtuous or cleansing action (Zhong & Liljenquist, 2006). Studies have found that even imagining virtuous acts (as opposed to recalling past moral acts) can be sufficient for people to license morally dubious behaviours (e.g., Khan & Dhar, 2006). The current research, therefore, builds on this body of research using imagined scenarios to explore balancing effects in environmental decision-making.

These studies also speak to the moral credits hypothesis, whereby, participants who feel that they have harmed the environment should feel motivated to regain moral credits, while those who feel that they had already benefitted the environment should feel that they had credits to spend (i.e., they can afford to be less pro-environmental) (Miller & Effron, 2010; Rabiau, Knäuper, & Miquelon, 2006).

The remainder of this chapter presents the results of Studies 3-5 in turn and concludes with a general discussion of the three studies.

4.1.Study 3: Exploring sequential pro-environmental decision-making

4.1.1. Study 3 aims

This study investigated whether participants would display flip-flopping (i.e., alternating between more and less pro-environmental choices) across a series of environmentally related vignettes. A total of 10 vignettes were developed (see Appendix

Three) which related to a range of different environmentally significant behaviours (e.g., water and energy use). Participants were first asked to imagine the dilemma described by the vignette and then to decide how they would respond. In each case, participants had to choose between making a decision which would be personally beneficial but environmentally costly (e.g., indulging in a long hot shower) or environmentally beneficial but personally costly (e.g., forgoing a long hot shower).

The study was quasi-experimental and participants were divided into two groups depending on whether or not their decision to the first vignette seen was pro-environmental or not. It was predicted that participants' decisions would be influenced by their previous decisions. It was also predicted that if participants balanced personal benefits with environmental benefits, then the data would reveal a "flip-flopping" pattern with responses alternating between more and less pro-environmental choices.

4.1.1. Pilot Study: vignette development

A series of vignettes were developed and refined by the author and the authors' supervisors. A total of 10 vignettes were selected for piloting with first year psychology students. The full text for all vignettes is available in Appendix Three. The vignettes consisted of a series of commonplace situations which involved environmentally relevant decisions such as shopping for clothes (e.g., buying new versus second hand), personal hygiene (e.g., length of shower: short vs. long), home energy use (e.g., turning out lights versus leaving them turned on) and food (e.g., preventing potential food waste vs. throwing food away). The vignettes were piloted to ensure that the scenarios were plausible and that participants agreed with the researcher as to which responses were more pro-environmental and also personally costly. A total of 13 students participated in the pilot study. Due to time limitations, participants did not manage to respond to questions about all the vignettes. The minimum number of participants who answered questions about any single vignette was 5. Order was counterbalanced to ensure even coverage.

The questions asked and the mean responses for the vignette pilot study are reported in Table 4-1. Questions were scored on a 1-4 scale with higher scores indicting stronger agreement. The vignette evaluation form can be seen in Appendix Three.

In this pilot, participants were asked to read each of the 10 vignettes in turn and to rate how easy the vignette was to understand and to what extent the vignettes and response options were believable. Participants also rated how pro-environmental and personally costly they deemed each of the response options to be. Finally participants were asked to discuss whether they felt that their fellow undergraduate students would be likely to feel proud of undertaking the more difficult but pro-environmental choices or conversely whether they would be likely to feel guilty for failing to make pro-environmental decisions. This final discussion was not recorded or coded, but was borne in mind when developing the scenarios. The vignettes and response options were revised in line with the feedback from participants.

Table 4-1: Vignette Pilot Mean Scores

Vignette[15]	How easy is it to understand the vignette?	How easy it to understand the vignette response options?	How believable is the vignette?	How believable are the vignette response options?	How pro-environmental is response option 1?	How pro-environmental is response option 2?	How personally costly is response option 1?	How personally costly is response option 2?
1 (dispose of vs. recycle leftover paint)	3.90	3.80	3.50	3.56	2.11	3.78	1.33	2.44
2 (new clothes vs. second-hand)	3.90	3.80	3.70	3.78	1.78	2.89	2.11	1.89
3 (dispose of vs. store surplus recycling)	3.70	4.00	3.80	3.89	1.11	3.56	1.22	1.89
4 (disposable vs. reusable nappies)	3.75	3.88	3.50	3.86	1.57	3.29	2.86	2.29
5 (plane vs. train)	3.86	3.86	3.86	3.00	1.43	3.00	2.00	2.86
6 (don't adjust vs. adjust boiler)	3.67	3.67	3.89	3.67	1.33	3.67	2.78	2.22
7 (lights on vs. off)	3.88	3.75	3.67	4.25	1.75	3.00	2.25	2.50
8 (dispose of vs. use damaged fruit)	3.57	3.57	3.43	3.43	1.43	3.43	2.29	2.14
9 (plastic vs. eco bag)	3.83	3.83	3.83	3.60	1.60	4.00	1.80	2.20
10 (long vs. short shower)	3.60	3.80	3.60	3.60	1.60	3.60	2.20	1.80

[15] In the actual exercise counterbalancing was used meaning that the pro-environmental response was not always presented as option 2.

4.1.2. Participants

In the main study, a total of 55 first year psychology undergraduates at the University of Sheffield were recruited through an online participant pool and volunteered in exchange for course credits. Of these, 48 were female and 7 were male.[16] Participants undertook a computer-based lab study. Participants were assigned to one of two conditions based upon their first response. An independent-samples t-test was conducted to compare the age of participants in both conditions. There was no significant difference in age between conditions; $t(46) = 1.08$, $p = .286$ (two-tailed). Similarly, no significant differences were found with respect to self-reported altruism; $t(53) = 1.38$, $p = .173$ (two-tailed) or self-interest scores; $t(53) = .34$, $p = .666$ (two-tailed) or in social desirability scores; $t(53) = .56$, $p = .581$ (two-tailed). However, an independent-samples t-test comparing green identity scores found a significant difference for pro-environmental first choosers and less pro-environmental first choosers; $t(53) = 2.96$, $p = .005$ (two-tailed). The mean scores are presented in Table 4-2 below.

Table 4-2: Descriptive Statistics by experimental condition

	Pro-environmental first choice			Less pro-environmental first choice		
	M	SD	N	M	SD	N
Age	19.47	1.38	17	19.03	1.33	31
Green ID[17]	15.23	1.93	22	13.24	2.72	33
Altruism[18]	12.00	2.49	22	13.18	3.46	33
Self interest[19]	9.86	2.38	22	10.12	2.00	33
Social desirability[20]	17.14	3.66	22	16.55	3.99	33

The decision was taken to advertise the study as more generally relating to everyday decision-making rather than to the environment. This was done in order to avoid recruiting a sample of participants with strong green identities who might be less likely to exhibit compensating (Rabiau et al., 2006). Following the computer-based task there was a funnelled debrief to check whether participants had guessed the exact purpose of the study. A funnelled debrief involves asking participants for their thoughts regarding

[16] There was a roughly equal number of male participants in each condition (less pro-environmental first choosers = 3 males and pro-environmental first choosers = 4 males).
[17] Scale coded 1 to 5, with higher scores being indicative of stronger environmental identities.
[18] Scale coded 1 to 4 with higher scores being indicative of stronger endorsement of the concept.
[19] Scale coded as above.
[20] Response options were "yes", "no" and don't know". Honest responses score 1 for 'yes' and 3 for 'no', while dishonest answers score 3 and 1 respectively. 'Don't know' is coded as 2.

the purpose of the study. Questions are very open at the start but become progressively more specific. This procedure was used because there was some concern that participants might guess at the purpose of study, thus, raising the possibility of biased responses. No participant guessed the exact purpose of the study.

4.1.3. Methods and materials

A total of 55 first year psychology students undertook the main experiment. Participants completed the study individually on a computer in lab conditions. The study was run using the online survey platform Qualtrics. Participants were given the following instructions before responding to the 10 vignettes which were presented in a random order:

> As you read each of the stories, please take a little time to imagine yourself in the situation described. Even if you have never experienced the situation before, try to imagine yourself in it. After reading each story you will need to make a decision. Remember, that you have the opportunity to do EITHER of the options which are presented. Please answer as honestly as possible. There are no right or wrong answers.

Each of the vignettes constituted a scenario which required participants to make a choice between acting in their own interest or that of the environment. It was not possible to do both. An example is provided below:

> You are studying Environmental Conservation at a university in the UK. You have been given the opportunity to attend a training course assessing the environmental impact of different activities. The course is in France and you know that it's a great opportunity to develop your professional skills. You have a limited budget and after some research you find that it is more expensive to travel by train than by plane. However, flying will result in significantly more carbon emissions than rail travel. You are aware that flying will cause greater damage to the environment; but flying will save on travel costs and enable you to afford nicer food and accommodation while you are away. Which of the following would you do?
>
> - Travel by plane.

- Travel by train.

The decision was made to ask participants what they *would* do rather than what they *should* do. "Should" questions are likely to focus participants on the moral dimensions of the scenario and how they should ideally act. As this research was interested in the intention-behaviour gap participants were instead asked what they *would* realistically do (Braun & Clarke, 2013).

After responding to the 10 vignettes participants were then asked to provide basic demographic information (age and sex). Participants then completed four items adapted from the Whitmarsh and O'Neill (2010) green identity scale (Cronbach's α = .70) and a short version of the Marlowe-Crowne Social Desirability Scale (Ray, 1984) (Cronbach's α = .65). Both these scales are discussed in detail in Chapter 2. Finally participants completed a 7-item altruism subscale (Cronbach's α = .82) and a 4-item self-interest value subscale (Cronbach's α = .67). These were sourced from Schwartz' Moral Norm Activation Model and were presented as used by Stern, Dietz, Guagnano, and Kalof (1999). These were included in order to ensure that participants did not differ in their levels of self-interest across conditions. Participants were instructed to indicate the extent to which the values were a guiding principle in their life using a 4-point Likert scale anchored by strongly agree and strongly disagree. Items from the altruism subscale included "Social justice, correcting injustice, care for the weak" while items on the self-interest subscale included "wealth, material possessions, money". The scale was coded so that higher scores indicated stronger agreement with the values.

4.1.4. Results

Figure 5 shows the behaviour of participants across the ten randomly displayed vignettes. The responses are presented in the order in which participants saw and responded to the vignettes (i.e., first vignette seen, second vignette seen, third vignette seen, etc.). It can be seen that participants who made a first pro-environmental choice tended to make an un-environmental second choice. Participants who made an un-environmental first choice tended to make a pro-environmental second choice. Participants showed some evidence of "flip-flopping" between pro-and un-environmental behaviours in subsequent choices. The results, therefore, appear to follow the same pattern as found by Zhong et al. (2010).

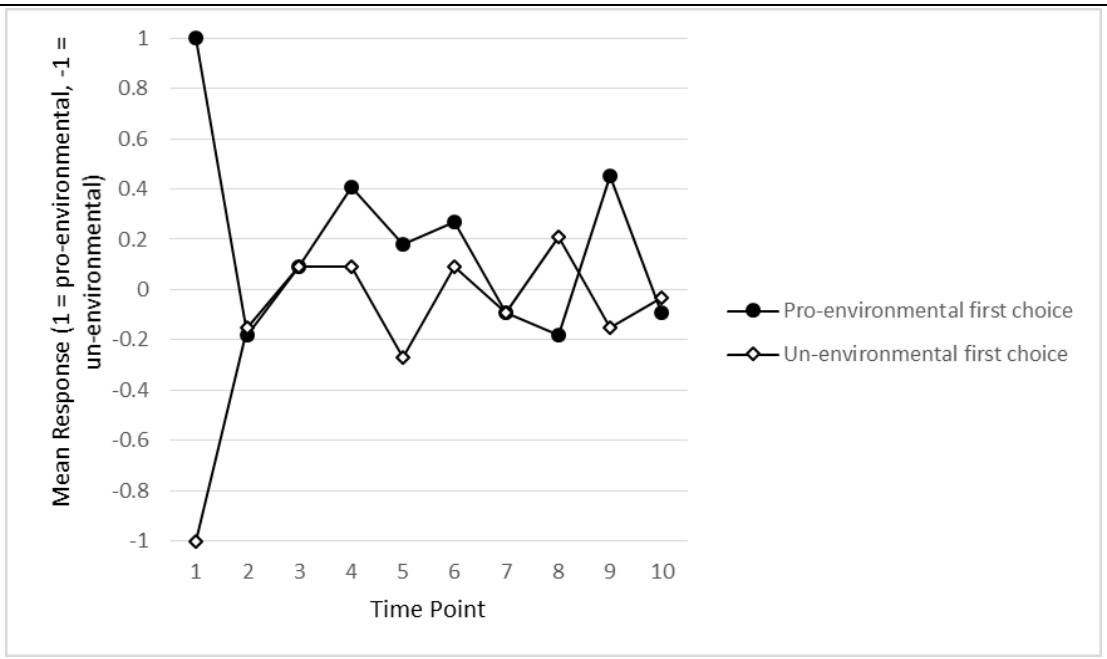


Figure 5: Impact of vignette order on pro-environmental decisions

To investigate whether this "flip-flopping" effect was significant an average score was calculated for each participant for vignettes 1, 3, 5, 7 and 9 (odd vignettes) and for vignette 2, 4, 6, 8 and 10 (even vignettes).[21] The rationale for this was that if flip-flopping were to occur then responses to odd numbered vignettes should differ significantly from responses to even numbered vignettes. To investigate whether this hypothesis was correct participants were divided into two groups depending on whether they made an initial 'pro' (pro-environmental) or less pro (less pro-environmental) first choice. Following this, two paired-samples t-tests were conducted. The first compared scores for odd and even numbered vignettes for less pro-environmental first choosers (n = 33). A significant difference between the scores for odd numbered vignettes (M = .36, SD = .20) and even numbered vignettes (M = .52, SD = .25); $t(32) = 2.73$, p = .010 (2-tailed) was found. The second paired samples t-test compared scores for odd and even numbered vignettes for pro-environmental first choosers (n = 22). Again, a significant difference between the scores for odd positions (M = .66, SD = .18) and even positions (M = .51, SD = .17); $t(21) = 2.85$, p = .009 (2-tailed) was found. From these results it appears that there is some evidence to suggest that participants were alternating between more and less pro-environmental responses.

[21] The vignettes were presented in a randomised order. The vignette first seen by one participant is likely, therefore, to differ from the vignette first seen by another participant. The numbering relates solely to the timing and order of participants responses (i.e., the vignette first seen and responded to).

4.1.4.1. Exploring the non-independence of observations hypothesis

While there was some initial evidence to suggest that participants were flip-flopping between more and less pro-environmental choices further analyses were conducted both as an alternative way of testing the "flip-flopping" hypothesis and also to explore the effects of other factors on participants' choices such as green identity, social desirability and dispositional altruism. First, to further test whether it was the case that one decision to a vignette would influence another (rather than each decision being independent), the data was re-formatted with each participant's responses to vignettes being presented in pairs. Each pair was then placed on a separate line. For example, in Table 4-3 below the participant's responses are set out as follows: response to the vignette first and second seen, second and third seen, third and fourth seen and etcetera. There were, therefore, a total of nine lines per participant. Responses are coded so that 0 indicates a less pro-environmental choice and 1 indicates a more pro-environmental choice.

Table 4-3: Illustration of data layout for binary logistic regression

Participant Number	Vignette (order seen)	Response to preceding vignette	Response to subsequent (target) vignette
1	2	0	1
1	3	1	0
1	4	0	1
1	5	1	0
1	6	0	1
1	7	1	0
1	8	0	1
1	9	1	1
1	10	1	0

Direct logistic regression was performed in STATA to investigate: a) whether responses to a preceding vignette would influence responses to a subsequent vignette and b) to explore how green identity might influence pro-environmental decision-making. The analyses were conducted in two steps. First, a basic regression model was conducted which simply predicted responses to vignette using responses from the preceding vignette (Wald $\chi^2(1) = 2.35$, $p = .125$, Pseudo $R^2 = .01$, Log pseudolikelihood = -341.32). Second, green identity was added to the model (Wald $\chi^2(2) = 21.00$, $p < .0005$, Pseudo $R^2 = .03$, Log pseudolikelihood = -331.55) . Both regression analyses used clustering to take into account that there were multiple data points from each participant (because they responded to a series of vignettes). It can be seen that a negative

relationship was found between preceding vignette responses and subsequent responses indicating that participants who were initially pro-environmental were subsequently less likely to be pro-environmental and vice versa, after controlling for Green ID (step 2).

Table 4-4 Regression exploring the influence of previous choice on current choice

Step	Predictor	Odds ratio	Robust SE	z	P>[z]	95% CI	
						Lower	Upper
1	Constant	1.23	.17	1.43	0.152	.93	1.62
	T1	.72	.16	-1.53	.125	.47	1.10
2	Constant	.06	.04	-4.43	<.0005	.02	.21
	T1	.60	.14	-2.17	.030	.38	.95
	Green ID	1.28	.07	4.58	<.0005	.02	.21

(Number of observations = 495. Std. Err adjusted for 55 clusters in Participant ID.)

4.1.5. Study 3: Summary

Study 3 investigated participants' responses to a series of ten vignettes which presented a conflict between acting pro-environmentally and acting in accordance with self-interest. Evidence was found which suggested that participants did "flip-flop" between more and less pro-environmental decisions – balancing self-interest with environmental concern (when controlling for green identity). The results suggest that previous decisions can influence current and future decisions lending support for a compensatory ethics model (Zhong et al., 2010) where participants attempt to establish moral equilibrium between maximising pleasure and minimising harm (Miller & Effron, 2010; Rabiau et al., 2006). The results also indicate the importance of green identity in environmental decision-making. A significant limitation of Study 3, however, was that it was quasi-experimental. This is a limitation as, since participants were not allocated to conditions, as one might expect, participants who selected a pro-environmental choice for the first vignette tended to have a stronger green identity. This weakness is addressed in Study 4 which is described in the next section.

4.2.Study 4: imagining environmental actions

4.2.1. Study 4 aims

Study 3 found evidence supportive of compensating and licensing effects as measured by participants "flip-flopping" between acting in self-interest and acting to benefit the

environment. Nonetheless, as mentioned above, Study 3 had the limitation of being quasi-experimental. Study 4 aimed to address this limitation. Study 4 randomly allocated participants into one of two experimental conditions. The aim was to experimentally manipulate whether participants felt themselves to be in possession or in deficit of pro-environmental credits. For this purpose, a vignette was designed which presented a scenario in which someone either went to considerable effort to recycle or simply disposed of recycling with general waste. Recycling was chosen as the subject of the vignette: a) because participants in Study 1 argued that recycling was a moral obligation and b) because recycling is associated with moral and social norms within the wider literature (Thøgersen, 1996). It was anticipated that imagining a failure to recycle would make participants feel in deficit of moral credits and, therefore, make them more likely to make a first free choice that was pro-environmental to compensate. Conversely, participants asked to imagine acting pro-environmentally (i.e., recycling) were expected to exhibit licensing effects (i.e., being more likely to make a less pro-environmental first choice).

Items were included to measure feelings of guilt and pride in order to check the extent of participants' engagement with the imagined scenarios. It was anticipated that participants would feel guilt after imagining transgressing moral norms (Bamberg & Möser, 2007), while those participants who imagined going to considerable effort to recycle were expected to feel proud.

Study 4 also differed from Study 3 in that fewer vignettes were included (4 rather than 10). There were two reasons for this change. First the study design was based on that of Zhong et al. (2010) who used the four most effective vignettes from their earlier 12 vignette study. As in the 4 vignette study by Zhong et al. (2010) the first vignette was the imagined scenario where participants were told which decision they had made (in this case whether they recycled or not). This imagined decision was followed by three vignettes to which participants could respond freely. The three "free choice" vignettes were taken from Study 3. Second, fewer vignettes were required because the main focus of the study was to see whether participants would provide a first free choice that contrasted with their imagined choice. Another important change between Studies 3 and 4 was that Study 4 was conducted as an online survey rather than as a lab study. The reason for this was that a power analysis indicated that around 220 participants

were required to detect a medium sized effect and running the study online enabled the researcher to gain access to a larger participant pool.

Some additional measures were included. A measure of commitment and progress towards being more pro-environmental was added to Study 4. This is because the literature suggests that seemingly inconsistent or contrasting pro-environmental behaviours may also occur as a result of the way in which individuals monitor and pursue their goals (Meijers et al., 2014). For example, when a goal is as yet unfulfilled, goal related constructs are salient and individuals may feel a resulting strong motivation to pursue the goal (Bargh & Chartrand, 2000). However, once someone has acted in accordance with that goal, motivation may decrease (Meijers et al., 2014). For instance, someone with the general aim of being more pro-environmental and who undertakes a pro-environmental action (e.g., recycling) may feel that they have to some extent achieved their goal for the day and, therefore, feel licensed to relax in the pursuit of this goal. In contrast another person might interpret their decision to recycle as further evidence of their commitment to being pro-environmental, thus, motivating them to undertake further pro-environmental decisions (Fishbach, Eyal, & Finkelstein, 2010).[22]

The study explored whether feelings of progress would be positively associated with higher levels of flip-flopping. It also investigated whether higher levels of commitment would result in more consistent decision-making (lower levels of flip-flopping). Additionally, as in Study 2, a measure of intention was included. Just as in Study 2 it was expected that participants who reflected on environmental harm would express stronger (compensatory) intentions to be more pro-environmental.

Finally, a measure of normative beliefs about environmental obligations (those of individuals, businesses and governments) as used by Stern et al. (1999) was also included to investigate how this may relate to the level of flip-flopping seen. It was expected that participants with strong normative beliefs may be less willing to make trade-offs in their pro-environmental decision-making.

[22] Goal commitment and progress are further explored in the next chapter.

4.2.2. Participants

A total of 413 people from the University of Sheffield student volunteers list responded to the online survey. The study was advertised as generally relating to decision-making rather than being specifically about the environment. As before, the aim of this was to reduce the risk of recruiting a sample of participants with a particular interest in or commitment to the environment. A total of 56 people were excluded from analysis because they did not provide any data. Another individual was excluded because of a technical problem with the online survey. A further 69 participants were excluded from the analysis because they provided an incorrect response to a comprehension question which was designed to check whether participants had read and understood the imagined recycling scenarios. This left a total of 286 respondents. The sample contained 102 males, 168 females and 2 who identified as other. Other descriptive statistics are presented in Table 4-5.

Table 4-5: Descriptive statistics by experimental condition

	Imagined recycling			Imagined failure to recycle		
	M	SD	N	M	SD	N
Age	23.94	6.63	134	23.95	6.65	138
Green Identity	15.13	2.71	135	14.11	2.74	140
Normative Belief	30.96	3.88	135	30.61	4.55	138

Participants were randomly assigned to one of two conditions (imagine recycling or failure to recycle). An independent-samples t-test was conducted to compare the age of participants in both experimental conditions. There was no significant difference in age between conditions; $t(270) = .01$, $p = .991$ or sex χ^2 (1, n = 270) = .22, $p = .637$. An independent-samples t-test comparing green identity scores found a significant difference between conditions; $t(273) = 3.10$, $p = .002$.[23] No significant difference was found, however, for normative belief scores between conditions; $t(271) = .71$, $p = .481$.

4.2.3. Materials and procedure

The vignette which set out the recycling scenario is presented below along with the comprehension question:

[23] The minimum score for the Green Identity Scale was 4 and the maximum was 20 (sum of 4 items coded 1 to 5).

You have had friends come to visit. As a result you have far more waste to dispose of than usual. You have been storing the materials that can be recycled (e.g., cardboard, tins, plastic bottles, and glass) but these are taking up valuable space in your small kitchen. Your recycling bin is full and you cannot fit in the remaining bags of plastic, glass, tins and paper. There is, however, some space in the general disposal bin but this will mean that the recyclable materials will be sent to landfill. There is a recycling centre at the supermarket which is a short walk from your house. You pack all the recycling into bags and take it to the recycling centre [recycle condition]/"You opt to put the recycling in the general disposal bin" [non-recycle condition].

What happened to the recyclable materials?

- Recycled
- Disposed of with the general waste

The same instructions as before (Study 3) were used in conjunction with the vignette. Below is an example of a vignette used in this study:

You find your job stressful and enjoy shopping for leisure at the weekends with your friends. You are all interested in fashion. You particularly enjoy treating yourself to new clothes. However, you have recently been made aware that cotton is one of the most pesticide intensive crops in the world. The clothing industry is therefore causing environmental damage and by shopping for leisure you are contributing to this problem. You find that it is possible to buy organic cotton which is grown in a more environmentally friendly way but that this is far more expensive and the range of designs is more limited. Which of the following would you do?

- Buy non-organic cotton
- Buy organic cotton

After reading the vignette, participants were asked to report how they felt about the decision which had been taken (namely to recycle or not) using a 5-point Likert scale anchored by "Very slightly or not at all" and "Extremely". The response options were: happy, sad, proud and guilty – with happy and sad being distractor items. The aim was

to investigate whether imagining success or failure to recycle would trigger feelings of guilt and pride in the participants. Participants were then instructed to read and respond to a series of vignettes. A total of three vignettes were presented (see Appendix Three) in a counterbalanced order.[24] Following the vignettes participants were asked to rate their intention to "do more to help the environment" using a 7-point Likert scale anchored by "very untrue of me" to "very true of me". The midpoint was labelled "neutral". Four filler items were included (e.g., "I intend to take more exercise"). Participants were then presented with the PANAS scale (positive subscale Cronbach's α = .91; negative subscale Cronbach's α = .89) and a short measure of green identity (Cronbach's α = .63) developed by Whitmarsh and O'Neill (2010). Also included were a two-item scale assessing progress and commitment toward the goal of being pro-environmental and a measure of Personal Normative Beliefs (Cronbach's α = .88) about environmental obligations (those of individuals, businesses and governments) as used by Stern et al. (1999). The Personal Normative Belief scale consisted of 9 items of which 3 related to beliefs about personal moral obligations (e.g., I feel a personal obligation to do whatever I can to prevent climate change), 3 related to obligations of government (e.g., The government should take strong action to reduce emissions and prevent global climate change) and 3 related to obligations of business (Business and industry should reduce their emissions to help prevent climate change). Responses were recorded on a 5-point scale anchored by "strongly agree" and "strongly disagree". Finally, there were two demographic questions on sex (Which one of these most accurately describes you? Male/Female/Other) and age (How old are you?) which was an open response question.

4.2.4. Results

4.2.4.1. Comprehension and manipulation checks

A question asking participants whether the materials were recycled or not was included in order to assess whether participants had read and understood the vignettes. In total 69 participants were excluded from the analysis because they provided an incorrect response to the question. A manipulation check was also undertaken to assess whether

[24] Counterbalancing controlled for order effects while also making the data output from Qualtrics easier to process than when randomisation was used.

participants had emotionally engaged with the imaginative exercise. Two independent samples t-tests confirmed that participants who imagined failure to recycle reported significantly higher guilt (M = 3.11, SD = 1.13) than participants who imagined recycling (M = 1.12, SD = .45); t(187.06) = 19.61, p = <.001 (equal variance not assumed), while participants who imagined failure to recycle reported significantly lower pride (M = 1.14, SD = .63) than participants who imagined recycling (M = 3.17, SD = 1.20); t(214.36) = 17.92, p = <.001 (equal variances not assumed). This suggests that the manipulation was effective.

4.2.4.2. Environmental decision-making

Based upon Study 3 and the concept of moral licensing it was predicted that participants would make a free choice that contrasted with their imagined (i.e., forced) response. Participants who had imagined causing harm to the environment by not making the effort to recycle were expected to compensate by making a pro-environmental choice. In contrast, participants who had imagined recycling were expected to feel licensed to act less pro-environmentally on their first free choice. However, a chi-square test for independence (with Yates Continuity Correction) indicated no significant association between imagined choice and first free choice, χ^2 (1, N = 286) = .14, p = .713, phi = .03.

Table 4-6: Participants' first free choice after imagining recycling scenarios

		Less pro-environmental first free choice made	More pro-environmental first free choice made
Imagined failure to recycle condition	Count	92	51
	Exp. Count	90	53
Imagined recycling condition	Count	88	55
	Exp. Count	90	53

If participants in the failure to recycle condition flip-flopped (i.e., alternated between doing what was personally beneficial and what was pro-environmental) then they should have made a maximum of 2 pro-environmental free choices. In contrast, if participants in the imagined recycling condition flip-flopped they should have made only 1 pro-environmental free choice. The hypothesis that the imagined failure to recycle condition would select a greater number of pro-environmental responses to the vignettes was also unsupported by the data; t(281.48) = 1.55, p =.123 (two tailed) (equal variances not assumed). Taken together these analyses found: a) no evidence that participants made a first free choice that contrasted with their imagined choice (which

would have been indicative of compensating and licensing effects) and, b) that participants in the imagined failure to recycle condition did not make efforts to compensate.

4.2.4.3. Exploring sequential decision-making

Following on from Study 3, a logistic regression analysis was conducted to look for evidence of flip-flopping in sequential decision-making. Again, the analyses were conducted in two steps. First, a basic regression model was conducted which simply predicted responses to vignette using responses from the preceding vignette (Wald $\chi^2(1) = 5.72$, $p = .017$, Pseudo $R^2 = .01$, Log pseudolikelihood = -369.80). Second, green identity was added to the model (Wald $\chi^2(2) = 39.83$, $p < .0005$, Pseudo $R^2 = .07$, Log pseudolikelihood = -346.28) . Both regression analyses used clustering to take into account that there were multiple data points from each participant (because they responded to a series of vignettes). As shown in Table 4-7 response to "preceding vignette" (T1) was a significant predictor of "response to vignette" (T2) but that this effect was no longer significant when green identity was added as a predictor. From this data it can be seen that: a) strength of green identity is more important in predicting choice than was "preceding vignette" and b) the direction of the relationship for T1 is positive meaning that participants showed highlighting rather than balancing in their choices. Study 4, therefore, did not replicate the findings of study 1.

Table 4-7 Regression exploring the influence of previous choice on current choice

Step	Predictor	Odds ratio	Robust SE	z	P>[z]	95% CI	
						Lower	Upper
1	Constant	.59	.07	-4.57	<.0005	.47	.74
	T1	1.54	.28	2.39	.017	1.08	2.20
2	Constant	.02	.01	-6.30	<.0005	.00	.06
	T1	1.03	.20	.13	.895	.70	1.51
	Green ID	1.28	.06	5.75	<.0005	.18	1.40

(Number of observations = 550. Std. Err adjusted for 275 clusters in Participant ID.)

4.2.4.4. Intention

It was expected that participants who had imagined failing to recycle would express stronger intentions to help the environment. This, however, was not the case.

Participants who imagined recycling reported significantly stronger pro-environmental intentions (M = 5.24, SD = 1.09) than participants who imagined failing to recycle (M = 4.88, SD = 1.35); $t(281) = 2.47$, p = .014 (2 tailed) suggesting a positive spillover (consistency) effect rather than evidence of compensation.

4.2.4.5. PANAS

This second measurement of affect took place after participants had completed the vignette exercise. As before, participants in the imagined failure to recycle condition (M = 2.09, SD = 1.10) reported significantly stronger feelings of guilt than participants who imagined recycling (M = 1.65, SD = .964); $t(273) = 3.48$, p = .001 (two tailed). However, participants who imagined recycling no longer reported significantly stronger feelings of pride (M = 2.13, SD = 1.21) than those who imagined failing to recycle (M = 1.15, SD = 1.14), $t(273) = 1.90$, p = .059 (two tailed).

The focal emotions in the study were guilt and pride. However, overall positive and negative affect scores were also checked. The results are as follows: participants in the imagined failure to recycle condition (M = 17.56, SD = 6.94) reported significantly stronger negative affect on the PANAS measure than participants who imagined recycling (M = 15.61, SD = 6.91); $t(273) = 2.34$, p = .020 (two tailed). Similarly, participants who imagined recycling had significantly stronger positive affect (M = 25.13, SD = 8.77) than those who imagined failure to recycle (M = 22.78, SD = 8.61); $t(273) = 2.24$, p = .026 (two tailed).

4.2.4.6. Perceptions of commitment and progress

It was anticipated that feelings of progress in being environmental (e.g., among participants who were more focused on environmental sub goals such as doing the recycling, than on the superordinate goal of "being pro-environmental") would positively correlate with higher levels of flip-flopping in responses. In contrast, a negative relationship between feelings of commitment and the number of times participants' flip-flopped was expected. However, there is no significant relationship in terms of either commitment or progress (between Progress and Sum of Flip-Flops, r = .08, n = 275, p = .173, between Commitment and Sum of Flip-Flops, r = .03, n = 275, p = .577).

4.2.4.7. Normative Belief

A scale was included to explore the relationship between normative beliefs and how (in)consistent participants were their environmental decision-making. It had been expected that normative beliefs would be negatively correlated with more inconsistent decision-making. However, there was no significant correlation between Normative Beliefs and Sum of Flip-Flops, $r = .10$, $n = 273$, $p = .109$.

4.2.5. Study 4: Summary and discussion

In Study 3, evidence suggesting the presence of compensating and licensing effects was found. It appeared that participants flip-flopped between more and less pro-environmental decisions in an attempt to balance self-interest with environmental interests. Study 4 built on this previous quasi-experimental study by randomly allocating participants to one of two experimental conditions (imagined recycling and imagined failure to recycle). The main hypothesis was that if participants were compensating and licensing they would make a first free choice which contrasted with their imagined decision (to recycle or not). The study also looked at sequential decision-making to investigate whether participants would continue to alternate between more and less pro-environmental decisions in their remaining free responses. Study 4 also follows on from Study 2 by looking at whether participants who imagined harming the environment would report higher levels of guilt and whether those imagining benefitting the environment would report higher levels of pride.

While participants who imagined a failure to recycle did report higher levels of guilt they did not make a pro-environmental (i.e., compensatory) first free decision. Similarly, while participants who imagined recycling reported feeling pride they did not show evidence of self-licensing by making a less pro-environmental first choice. Rather, taken together the results of Study 4 suggest consistent rather than contrasting decision-making. Participants who imagined acting pro-environmentally went on to express greater intentions to be pro-environmental in future than participants who had imagined acting less pro-environmentally. Furthermore, the relationship between previous response to a vignette and current response to a vignette was positive which might be taken to suggest consistency in responses. Notably, this relationship between past and current response disappeared after controlling for Green Identity, suggesting that Green

Identity was a primary driver of responding within the task. These results differ, therefore, from both those of Study 3 and the predictions of Zhong (2010).

One potential explanation for this difference might be found in the participant samples which differed in age, with participants in Study 4 being older. The literature suggests that consistency in moral decision-making increases with age (see Sidani, Zbib, Rawwas, & Moussawer, 2009). Furthermore, participants in Study 4 completed the study online rather than in lab conditions where an experimenter was present. These issues are taken up in Chapter 6: Main discussion.

Another reason why the results of Studies 3 and 4 differ may be because the imagined recycling vignette informed participants whether they had recycled or not rather than giving them a free choice. According to the Norm Activation Model (see Chapter 1) in order to act pro-environmentally participants would need to feel a sense of personal responsibility for the state of the environment (i.e., whether recycling had taken place or not). Participants who were informed that they had failed to recycle may have felt negative without feeling personally responsible. Similarly, participants who were instructed to imagine recycling rather than actually selecting this option may have felt pride and yet not have felt that they had obtained a moral license to relax in pursuit of this goal (Blanken, van de Ven, & Zeelenberg, 2015; Bradley-Geist, King, Skorinko, Hebl, & McKenna, 2010).

A third reason for the difference in results between Studies 3 and 4 could relate to the nature of the vignettes. For example, the first vignette seen by participants in Study 4 was a scenario about waste and pollution (by recycling materials could be re-used rather than contributing to landfill). Two of the free choice vignettes have a very similar theme. One related to whether to make the effort to throw paint away or give it away so that it could be used again while the other looked at whether to invest in re-usable nappies or use disposable ones that will add to landfill. The third vignette related to shopping for leisure (i.e., unnecessary consumption) highlighting the pollution caused by clothes manufacture. Because more vignettes were used in Study 3 there was a greater variety of scenarios making the situations less related. It is possible, for example, that participants may have been more sensitive to making contrasting or hypocritical decisions on vignettes that were perceptively similar leading them to act more consistently (Blanken et al., 2015). This question is explored by Study 5.

Before moving on, it is interesting to note that, in Study 4, while participants were randomly assigned to experimental conditions, participants in the imagined recycling condition had significantly higher reported green identity scores than participants who had imagined a failure to recycle. It is possible that this difference results from a failure in randomisation, whereby, more participants with stronger green identities were allocated to the imagined recycling condition. However, as participants responded to the green identity measure after the vignettes it is perhaps more probable that the study inadvertently manipulated participants' sense of green identity. For example, it may have been the case that imagining recycling not only made participants feel pride but also re-enforced their sense of green identity. In contrast, it may have been the case that participants who imagined acting less pro-environmentally and who experienced feelings of guilt may have felt discouraged from undertaking further pro-environmental decisions. In short, the exercise may have undermined their green identities. That participants in the imagined failure to recycle condition continued to feel negative is confirmed by the PANAS scale that was completed at the end of the vignette exercise.

4.3. Study 5: Exploring consistency and contrast in sequential environmental decision making across similar and dissimilar vignettes

4.3.1. Study 5 aims

So far this chapter has presented two studies. The first set out to assess whether there was evidence of participants seeking to establish a balance between personally beneficial and environmentally beneficial decisions over a series of 10 different scenarios. The finding was that participants did 'flip-flop' between more and less pro-environmental decisions once the extent of their green identity was controlled for. Study 4 aimed to build on the findings of Study 3 and better understand the licensing and compensating mechanisms by manipulating participants' first choice and, thereby, whether they started the exercise in moral credit or deficit. The results of Study 4 differed from those of Study 3 in that rather than finding contrasting decisions participants were found to act more consistently. A number of reasons were proposed as to why the results differed. One potential explanation was that the difference related to the nature of the vignettes. For example, participants may have been more sensitive to

inconsistencies in their decision-making because the vignettes in Study 4 were more conceptually similar (e.g., in the type of issue raised) than those in Study 3.

Within the literature there has been some debate regarding whether positive spillover (Thøgersen, 1999; Tucker & Douglas, 2007) *or* licensing and compensating (i.e., "flip-flopping") (Blanken et al., 2015) are more likely to occur when behaviours are conceptually similar. On the one hand where behaviours are conceptually similar it might be expected that people might see the connection between behaviours and, therefore, act more consistently. On the other hand it has been proposed that where behaviours are conceptually similar it would be easier for someone to assess whether they are in a state of moral credit or deficit (see Study 1). It would arguably be easier, for example, to make an assessment of whether one form of travel could off-set or compensate for another (e.g., cycling to compensate for car use) than trying to assess whether car travel could be off-set by waste prevention (e.g., recycling to compensate for car use).

The main aim of Study 5, therefore, was to investigate whether the extent to which vignettes were conceptually similar would influence the amount of compensating and licensing ('flip-flopping') seen. The results of Study 4 suggest that compensation will be less likely to occur within related vignettes. The present study (Study 5) had two experimental conditions: conceptually related vignettes (e.g., all relating to domestic energy use *or* to travel) and conceptually dissimilar vignettes (e.g., a combination of travel *and* domestic vignettes presented alternately to maximise variation). Participants were randomly allocated to one of these conditions. In Study 5, participants were able to make their own choice in response to the vignette first seen, rather than being asked to imagine having made a particular choice. It was hoped, therefore, that participants would feel personally responsible for the decisions made.

Furthermore, like Studies 3 and 4, the present study (study 5) also aimed to further explore sequential decision making by looking at the extent to which previous decisions (i.e., whether one is in moral credit or deficit) and green identity would influence the amount of flip-flopping seen.

As previously outlined, after controlling for green identity, Study 3 found a negative relationship between previous and current decisions suggesting compensating and licensing effects (as measured by flip-flopping). In contrast, the relationship identified

by Study 4 was positive suggesting more consistent responses (or a lack of flip-flopping). Study 5, once again, set out to look for evidence of compensation and licensing by taking into account behavioural history and green identity. Finally, the extent to which strength of green identity influences the amount of compensating seen (as measured by flip-flopping) was assessed. This was to investigate whether participants who somewhat but not fully identified with the goal of being pro-environmental would be more likely to compensate relative to the other participants as suggested by Rabiau et al. (2006) in the literature on health compensation.

4.3.2. Pilot study

A set of 8 vignettes were developed by the author. The vignettes underwent an iterative process of revisions which involved being piloted by undergraduates and discussed by the author and the author's supervisory team. Following this the vignettes were amended and then re-piloted. The results of the final pilot study are presented in this section. Four vignettes related to travel including decisions about commuting to work (car versus bicycle), travelling to meet friends for lunch (car versus bus), going to the shops (car versus foot) and traveling to another city (car versus train). Four vignettes related to domestic decisions including whether to turn up the thermostat or wear a jumper, whether or not to turn off a laptop left on at night and whether to go back home to turn off lights. As before, each vignette had a response option that forced participants to choose between doing something personally beneficial (e.g., more convenient) but which had a greater negative environmental impact (e.g., increased CO_2) or acting pro-environmentally but at greater cost to self.

Participants: Ten Level 1 Psychology students rated the 8 vignettes in an online study in exchange for 1 course credit. Participants had a mean age of 18.90 (range 18 – 20 years). A total of 9 participants were female and 1 was male.

Procedure: The procedure was as follows. First the participants were asked how easy it was to imagine themselves in the situation described. Responses were recorded on a 4-point scale with response options being "very easy, somewhat easy, somewhat difficult and very difficult (coded as 1 = very easy and 4 = very difficult). Participants who felt that a vignettes was not very easy to imagine were invited to explain why this was the case (open response question) in order that the vignette could be improved. Next participants were asked how much of a negative impact (e.g., in terms of water, energy,

carbon etc.,) each of the vignette response options would have (e.g., travel by car vs. bicycle). Responses were recorded on a 4-point scale (1 = no impact, some impact, moderate impact and 4 = big impact). Participants then evaluated how personally costly each response option was (e.g., in terms of inconvenience caused, take taken, personal comfort). This was done using a 4-point scale (1 = not costly, somewhat costly, quite a bit, 4 = very costly). Participants were invited to provide suggestions on how the vignette and/or its response options could be improved.

Results: The results of the pilot trial were as follows. Both the travel vignettes (M = 1.10, SD = .21) and the domestic vignettes (M = 1.23, SD = .34) were deemed easy to imagine and did not differ significantly in this respect; $t(9) = 1.25$, $p = .244$ (two tailed). Paired sample t-tests revealed that participants rated the less pro-environmental behaviours as having significantly higher negative impact (e.g., greater CO_2 emissions) (M = 2.75, SD = .40) than the more pro-environmental behaviours (M = 1.50, SD = .33), $t(9) = 6.87$, $p < .001$ (two tailed), and the more pro-environmental behaviours as being significantly more personally costly (e.g., in terms of inconvenience caused) (M = 2.25, SD = .53) than the less pro-environmental behaviours (M = 1.69, SD = .53), $t(9) = 2.30$, $p = .047$ (two tailed). It was important that acting environmentally was seen as more personally costly in order to establish scenarios where environmental and personal goals conflicted. A series of paired samples t-tests were conducted to check whether personal costliness and negative impact ratings were comparable between the two sets of vignettes. No significant differences were found (all $p \geq .158$).

4.3.3. Participants (main study)

For the main study, and in contrast to Studies 3-4, participants were staff members at The University of Sheffield, UK who were contacted via a university mailing list during March 2015. Staff members were chosen because they were deemed to be more likely to make decisions about commuting and home energy use. A total of 360 participants entered the online study, of which 18 were excluded because they did not actually engage with the task or gave incomplete responses to the vignettes. Participants were offered the opportunity to enter into a prize draw to win £30. Participants had a mean age of 38.38 years (range 18–72), 132 (38.5%) were male and 208 female (60.6%). A total of 328 (95.6%) participants reported contributing to household utility bills, 261

(76.1%) stated that they had access to a car and 253 (73.8%) reported traveling some distance between their home and work place on a regular basis.

4.3.4. Materials

There was some concern that participants' decision-making might be influenced by financial considerations and that this might lead participants to make more pro-environmental decisions (e.g., saving energy) than would be the case if money was no issue. For this reason the vignette instructions used in Studies 3 and 4 were amended to read as follows:

> Instructions. Please read carefully. As you read each of the stories, please take a little time to imagine yourself in the situation described. Even if you have never experienced the situation before, try to imagine yourself in it. After reading each story you will need to make a decision. You have the opportunity to do either of the options which are presented. Please respond to the information given in each story and note that in these scenarios, you have no restrictions on your budget, so there are no negative consequences of spending money. Please answer as honestly as possible. There are no right or wrong answers.

Vignettes either presented domestic energy use or travel related vignettes. Below are two examples of vignettes used in this study. The first vignette relates to domestic energy use while the second relates to travel.

> Imagine that you are at home relaxing after an exhausting day at work. You are starting to feel rather cold. The heating is on but the house takes some time to warm up. You could go all the way up to your room in the attic to find a jumper to wear to try and keep warm. Alternatively you could turn the electric heater on for half an hour which will make the room warm. Getting a jumper would be better for the environment but considering how tired and cold you feel, turning on the electric heater would be easier, especially as it is next to you in the lounge. Which of the following would you do?

- Turn on the electric heater instead of getting your jumper
- Don't turn on the electric heater and get your jumper

Imagine that you are planning a journey to your work place. You own a bicycle and a car and live 11km (7 miles) from your work place. There is a good cycle route between your home and work. Today the weather is bad so your cycle ride will be very cold and wet. However, you can get showered at work once you arrive. Otherwise you could drive to work, and there is no indication that there will be any traffic jams. Cycling would be better for the environment but considering the bad weather driving would be more pleasant. Which of the following would you do?

- Travel by car
- Travel by bicycle

After participants had responded to the vignettes they were asked to provide basic demographic data. The demographic questions were as follows: How old are you? This was an open response question. Which of the following best describes you (Male, Female, Other, Prefer not to say)? Do you contribute to your household utility bills (e.g., electricity or water)? Response options were: Yes, No, and Prefer not to say. Do you have access to a car (as either a driver or a passenger)? Response options were: Yes, No and Unsure. Do you have to travel some distance between your home and place of work on a regular basis. Response options were: Yes, No and Unsure/Prefer not to say). Finally participants were asked to complete a short measure of green identity designed by Whitmarsh and O'Neill (2010) (Cronbach's α = .74) which was described in Section 2.3.2 (beginning on page 41).

4.3.5. Procedure

The study was advertised as relating to decision making. After reading the instructions, participants were randomly allocated to one of two conditions. Participants either saw four conceptually similar vignettes (i.e., either relating to travel or to domestic tasks) or four dissimilar vignettes (i.e., a combination of domestic and travel vignettes). The order of the vignettes was counterbalanced using a balanced Roman Square design. Each vignette required participants to make a choice between a more personally beneficial but environmentally detrimental option and a personally detrimental but environmentally beneficial option. As in Study 3 participants were free to make their own first choice. It was possible for participants to alternate between more and less pro-

environmental behaviours a maximum of three times (i.e., between vignette 1 and 2, between vignette 2 and 3 and between vignette 3 and 4). For the purposes of analysis the two sets of conceptually similar vignettes were combined into one experimental condition (i.e., similar vignettes). The sets of combined travel and domestic vignettes were also combined into one experimental condition (i.e., dissimilar vignettes). After participants responded to the vignettes they were asked to provide basic demographic data and to complete a short measure of green identity designed by Whitmarsh and O'Neill (2010).

4.3.6. Results

4.3.6.1. Randomisation check

An independent samples t-test found no significant difference with respect to the age of participants (years) within the similar vignettes condition (M = 38.29, SD = 11.48) and the dissimilar vignettes condition (M = 38.47, SD = 1237); $t(337) = .14$, $p = .888$. No significant difference was found between conditions on the basis of sex χ^2 (1, N = 340) = .52, p = .473 (two-sided). Furthermore, no significant differences were found with respect to reported levels of green identity between similar (M = 14.98, SD = 2.91) and dissimilar (M = 15.26, SD = 2.61) conditions; p = .546 (two tailed).

4.3.6.2. Conceptual similarity of vignettes

Next the question was addressed as to whether participants would compensate and licence less (as assessed by the number of flip-flops between more and less pro-environmental decisions) in scenarios that were conceptually similar (i.e., where hypocrisy/inconsistency should be more apparent) than in scenarios that were conceptually dissimilar. To test this an independent samples t-test was conducted. Contrary to expectations there was no significant difference in flip-flopping between the similar (M = 1.30, SD = .94) and the dissimilar conditions (M = 1.43, SD = .93); $t(341) = 1.22$, p = .224.

4.3.6.3. Exploring Sequential Decision-Making

In Study 3, evidence of a negative relationship between preceding and current decisions was found suggesting that participants did “flip-flop” between more and less pro-

environmental decisions – thus, striking a balance between self-concern and environmental concern (once the extent of their green identity was controlled for). Study 4 further explored the relationship between participants' previous decisions and their present decisions. The evidence suggested that previous decisions were predictors of present decisions. However, once green identity was included in the regression model previous decision was no longer a significant predictor. Furthermore, unlike Study 3 the relationship between previous and current decision was positive suggesting that participants were acting consistently rather than flip-flopping. The present study (Study 5) ran the analyses again to see whether the findings of Study 3 could be replicated.

First, a basic regression model was conducted which simply predicted responses to vignette using responses from the preceding vignette (Wald $\chi^2(1) = 5.79$, $p = .016$, Pseudo $R^2 = .00$, Log pseudolikelihood = -697.34). Second, green identity was added to the model (Wald $\chi^2(2) = 31.51$, $p < .0005$, Pseudo $R^2 = .03$, Log pseudolikelihood = -680.82) . Both regression analyses used clustering to take into account that there were multiple data points from each participant (because they responded to a series of vignettes). As shown Table 4-8 in response to "preceding vignette" (T1) was a significant predictor of "response to vignette" (T2) but that this effect was no longer significant when green identity was added as a predictor. From this data it can be seen that: a) strength of green identity is more important in predicting choice than was "preceding vignette" and b) the direction of the relationship for T1 is positive meaning that participants showed highlighting rather than balancing in their choices. Study 5, therefore, did not replicate the findings of study 3.

Table 4-8 Regression exploring the influence of previous choice on current choice

Step	Predictor	Odds ratio	Robust SE	z	P>[z]	95% CI	
						Lower	Upper
1	Constant	.86	.08	-1.57	.116	.71	1.04
	T1	1.39	.19	2.41	.016	1.06	1.81
2	Constant	.12	.05	-5.06	<.0005	.05	.27
	T1	1.20	.17	1.28	.200	.91	1.59
	Green ID	1.15	.03	4.85	<.0005	1.09	1.21

(Number of observations = 1011. Std. Err adjusted for 337 clusters in Participant ID.)

4.3.6.4. Exploring the relationship between green identity and compensation

The above analysis (4.3.6.3) raises an important question regarding the relationship between green identity and compensation, namely, the extent to which strength of green identity influences the level of compensating seen (as measured by flip-flopping). In Chapters 1 and 2 the review of research on compensation suggested that compensation would most likely be seen in people who were somewhat but not fully committed to a goal (e.g., Beattie, 2010; Rabiau et al., 2006). By this reasoning we should expect participants who have either relatively strong or relatively weak green identities to act more consistently (i.e., flip-flop less) than those in the uncomfortable middle position who can be expected to experience greater goal conflict.

A total of 337 participants completed the 4 item measure of green identity. Responses were coded so that participants could score a minimum of 5 and a maximum of 20 – with higher scores being indicative of stronger green identities. The mean score for green identity was 15.12 (Range 7 – 13). To explore the hypothesis that people in the middle position (the middling or "light greens") would exhibit more flip-flopping than other participants the sample was divided into 2 parts. Participants scoring 7 – 13 (weak green identity) and 17 – 20 (strong green identity) were coded as 1 while participants scoring 14 – 16 were coded as 2 (middling greens). An independent samples t-test was then conducted to compare the extent of flip-flopping among the middling greens in comparison with all the other participants (i.e., strong and weak greens). There was a significant difference in scores for the middling greens (M = 1.51, SD = .92) and the other participants (M = 1.29, SD = .94); $t(335) = 2.09$, $p = .037$, $d = .24$. In line with the literature (e.g., Rabiau et al., 2006), therefore, it was found that participants with middling green identities did flip-flop (i.e., license and compensate) more than other participants.

The above finding further raised the question as to whether any differences would be found in the extent of flip-flopping among participants with middling green identities between similar and dissimilar conditions. An independent samples t-test was conducted. There was no significant difference in levels of flip-flopping between similar (M = 1.48, SD = .91) and dissimilar (M = 1.54, SD = .94) conditions; $t(127) = .422$, $p = .623$. Taken together these analyses suggest that: 1) participants with middling green identities flip-flop more than participants with strong and weak green identities and 2)

that participants with middling green identities flip-flop more often regardless of the conceptual similarity of scenarios.

4.3.7. Summary

Study 5 investigated whether the extent to which vignettes are conceptually similar would influence the amount of compensating (flip-flopping) seen. The results of Study 4 suggested that compensation may be less likely to occur within related vignettes where hypocrisy/inconsistency would be more obvious. This prediction was not, however, supported by the data. There was no significant difference in flip-flopping between the similar and the dissimilar conditions. Study 5 also looked at sequential decision-making and specifically at the influence of previous choices (behavioural history) and green identity in current decision-making. The results were consistent with Study 4 – showing consistency between prior and present decisions. Also, as before prior decision was no longer a significant predictor of present decision once green identity was entered into the model. Finally, the findings of Study 5 appear to be consistent with the wider literature on compensatory beliefs in that participants with middling green identities (as opposed to strong or weak green identities) appeared to compensate (flip-flop) more than other participants. However, no significant differences were found in the extent of flip-flopping among middling greens based the conceptual similarity of the vignettes.

4.4. General discussion

Each day individuals are faced with multiple moral choices, such as, whether to donate to charity, buy fair trade, recycle or volunteer. The literature suggests that in navigating the moral maze that is everyday decision-making people try to strike a balance between managing their reputations (e.g., as good moral people) and their self-interest (Effron, 2014; Merritt, Effron, & Monin, 2010; Miller & Effron, 2010; Rabiau et al., 2006). Previous research has further suggested that behavioural history is an important factor in shaping present moral choices (e.g., Zhong, Liljenquist, & Cain, 2009). Study 3 aimed to build upon this literature and, in particular, the work by Zhong et al. (2010) who looked at sequential ethical decision-making. To date, much of the work undertaken in this field has used experimental paradigms based on a two stage scenario (namely a manipulation and a response). Zhong et al. (2010), however, wanted to look

at decision-making across a greater range of instances in order to provide participants with multiple opportunities to balance self-interest with a desire to appear moral. Using a series of 12 vignettes (scenarios) Zhong et al. (2010) found that participants demonstrated a dynamic equilibrium in their ethical decision making – alternating between more personally advantageous but morally dubious options and more moral but personally disadvantageous options.

Study 3 used this novel approach which had previously been employed by Zhong et al. (2010) to investigate compensating and licensing effects in environmentally related sequential decision-making. Study 3 presented participants with ten vignettes and allowed them to choose freely between more and less pro-environmental responses. The findings complement those of Zhong et al. (2010) because participants who made an initial pro-environmental choice were subsequently more likely to make a less pro-environmental decision and vice versa across the vignettes. This "flip-flopping" pattern appears consistent with theories of moral licensing and moral cleansing where individuals who have just demonstrated their moral credentials proceed to act in a more morally dubious way while those individuals who have violated their values subsequently undertake actions which affirm their core values (Monin & Miller, 2001). Nonetheless, it should be noted that while there was evidence of "flip-flopping" this pattern was only significant within the regression model when green identity was controlled for. This suggests that a person will tend to act in accordance with their general green identity and that, if you control for the influence of this variable, prior decisions impact on later decisions in a licensing or compensatory way

The design of Study 3 had limitations. On one hand, allowing participants to make a free first choice most likely engendered feelings of responsibility for the decision made and thus promoted compensating and licensing (Bradley-Geist, King, Skorinko, Hebl, & McKenna, 2010). However, on the other hand, the lack of randomisation meant that the study had the weakness already identified of being quasi-experimental.

To address this weakness in design, participants in Study 4 were randomly allocated to one of two conditions – being asked to imagine making either a pro or less pro-environmental decision before responding freely to the remaining vignettes. The purpose of this imaginative exercise was to manipulate whether or not participants felt themselves to be in possession of moral credits. This in turn was predicted to influence whether or not participants would made a subsequent pro-environmental choice. Study

4 was based on Zhong and colleagues' second study which found initial evidence for compensation. In the study by Zhong et al. (2010) the condition which was asked to imagine making a less ethical choice subsequently freely chose to make a more ethical choice, while the condition asked to imagine making a more ethical choice subsequently chose to make a less ethical choice. For Zhong et al. (2010) this flip-flopping pattern remained significant for the second and third vignettes seen.

Contrary to expectations, however, the findings of Study 4 did not replicate those of Zhong et al. (2010). Study 4 did not find any significant association between imagined choice and free choice. The findings of Study 4 also differed from those of Study 3 (presented earlier in this Chapter) in that a positive relationship was found between choice and preceding choice. Again, this indicates an absence of flip-flopping and suggests that participants were acting consistently with their imagined choice.

There are a range of possible explanations for the differences between Studies 3 and 4. For example, because participants had not freely chosen their response they may not have felt responsible for the environmental harm or benefit described in the scenario. Secondly, participant's emotional responses may have played a role. For example, participants in the imagined failure to recycle condition reported significantly higher negative affect scores (e.g., guilt). Such participants may have actually felt discouraged from taking pro-environmental action or else cognitively resolved their guilt in some way. In contrast, participants who imagined recycling felt significantly more positive which may have encouraged them to act more pro-environmentally. Furthermore, as Study 4 used fewer vignettes than Study 3 and the vignettes used were arguably conceptually similar the question was raised as to whether the level of flip-flopping seen had been influenced by the nature of the vignettes themselves.

Study 5 aimed to address some of the limitations of Studies 3 and 4 by randomly allocating participants to experimental conditions while still allowing them make a free response (rather than an imagined choice). The study investigated whether the similarity of the pro-environmental behaviours being undertaken influenced the amount of flip-flopping (or compensating/licensing) behaviours seen. While Blanken et al. (2015) had predicted that greater licensing effects would be seen within related situations, Study 3 suggested that participants might be more sensitive to inconsistencies in their behaviours where vignettes were related. Contrary to either of these predictions, no significant difference was found based on the conceptual similarity of the vignettes.

Again, the study looked to evidence flip-flopping in sequential decision-making as found by Zhong et al. (2010). As in Study 4 preceding choice was a predictor of choice but was no longer significant when green identity was entered into the regression model. Again the relationship between preceding choice and choice was positive indicating consistency and, therefore, a lack of flip-flopping.

Study 5 further investigated the relationship between the extent of an individual's green identity and the level of compensation and licensing (as measured by flip-flopping) seen in their decision-making. Previous research would lead us to expect that people with low green identities (i.e., who do not really identify with being pro-environmental) should experience relatively low goal conflict when presented with the choice of acting to benefit self or the environment, and thus, act consistently (Rabiau et al., 2006). Similarly, people with stronger green identities should make more consistent pro-environmental choices and be less likely to exhibit tendencies towards compensation or licensing (Rabiau et al., 2006). For example, Meijers et al. (2014) found that participants with strong green identities were unlikely to show licensing behaviours within an environmental domain (although they did within non-environmental domains). Furthermore, Kaklamanou, Jones, Webb, and Walker (2015) found that endorsement of compensatory green beliefs was negatively associated with green identity. In the compensatory health belief model Rabiau et al. (2006) predicted that compensation would be most likely to occur among individuals who were somewhat but not fully committed to their health goals. This led to the prediction in Study 5 that participants had either relatively strong or relatively weak green identities should act more consistently (i.e., flip-flop less) than those in the uncomfortable middle position. In line with these expectations and the literature participants in the middling green category did make significantly more compensatory decisions (as measured by flip-flopping). Perhaps, surprisingly, there were no significant differences in flip-flopping among the middling greens based on the conceptual similarity of the vignettes. In short, these participants exhibited balancing behaviours regardless of how similar the scenarios were.

The three experiments presented here provide a novel approach to exploring sequential environmentally pertinent decision-making. The studies provide insight into spillover effects. For example, all three studies lend support to the hypothesis that previous decisions do in fact influence current decisions to some extent. The studies also show

the importance of green identity in environmental decision-making – with the "light" or "middling" greens being significantly more likely to exhibit compensating and licensing effects (as measured by flip-flopping) than other participants. Study 4 suggests that simply taking a moment to imagine undertaking a simple and low-cost pro-environmental behaviour could help to promote positive spillover effects, while Study 5 also suggests that strengthening green identity could help to promote positive spillover.

Questions still remain, however, as to why compensating and licensing were seen in Study 3 but not in Studies 4 and 5. Could it be the case, for example, that student participants who undertake the study in person (as opposed to online) are more likely to try and strike a balance between reputation management and pro-environmental decisions? Another possible explanation could relate to the way in which participants' mindset might influence whether or not they showed compensating and licensing effects or more consistent responses. For example, participants who focus on environmental subgoals (e.g., doing the recycling) might be more likely to relax in goal pursuit than participants who focus on abstract goals (e.g., being environmental). This question is explored in Study 6 in the next chapter.

4.4.1. Concluding thoughts

At the end of the previous chapter (Chapter 3, Study 2) evidence of compensatory intentions but not compensatory behaviours had been found. It has hypothesised that evidence of compensatory behaviours might be seen if participants were offered the opportunity to balance personal benefits with environmental benefits over a series of different scenarios. The 3 studies presented in this chapter (Chapter 4) provide some (albeit) equivocal evidence of compensatory behaviour. The analyses suggest that compensating and licensing effects are subtle and participants appear to be influenced more strongly by the extent of their green identities than by either previous behaviours or the conceptual similarity of scenarios. Furthermore, the analyses suggest that free choice, the age of participants and social pressure (e.g., presence of an experimenter in Study 3) could potentially be important when looking for compensating and licensing effects.

5. Chapter 5: Do perceptions of goal progress versus goal commitment influence the consistency of pro-environmental action?

5.1. Introduction

The previous Chapter (Chapter 4, Studies 3-5) explored the idea of compensation as a way of achieving balance between maximising pleasure and minimising harm (Rabiau, Knäuper, & Miquelon, 2006). Following on from the work of Zhong, Ku, Lount, and Murnigham (2010) the studies presented in Chapter 4 took a relatively novel approach by looking at sequential environmentally-related decision-making. Overall, Studies 3-5 found some evidence suggestive of compensation and licensing in decision-making as measured by "flip-flopping" (i.e., alternating between more and less pro-environmental choices) and as indicated by the relationship between guilt and intention. Furthermore, the studies found that behavioural history and green identity influenced participants' choices. While Chapter 4 focused on how people might balance conflicting goals, the current chapter focuses on the relationship between affect, goal construal, licensing effects and compensation. Specifically, this chapter considers how the way in which individuals interpret their advancement towards achieving a goal might influence licensing and compensating effects.

5.2. Study context: goal monitoring

In order to work towards any goal, it is crucial to monitor goal progress (Harkin et al., 2015). This process of monitoring can be seen as a test of consistency between one's desired state (e.g., being someone who is able to run a marathon) and one's current state (e.g., being someone who can only run short distance) (Moskowitz, 2009). Where a discrepancy is found it is thought that a state of tension arises. This tension could be expressed as, for example, a feeling of longing or as a negative emotion (e.g., guilt or regret) in relation to one's performance standard (Bandura, 1989; Moskowitz, 2009). The process of goal monitoring has been compared to a negative feedback loop (Carver & Scheier, 1981). For example, someone might test the degree of consistency between their desired and current state, initiate an action to reduce discrepancy, and either continue to take action until dissonance is reduced or once this is achieved terminate goal pursuit (Moskowitz, 2009). For instance, someone who is hungry may have the

goal of finding something to eat and, having done so, they may feel that they have eaten enough and, therefore, discontinue attending to this goal.

Arguably, it is easier to determine the extent of one's goal advancement in the case of goals which are fairly concreate and it is more difficult in the case of more abstract or "higher" goals. For example, having the goal of "being" something is far vaguer and more difficult to attain than having the goal of "doing" something. For instance, the goal of "being pro-environmental" could involve any number and type of actions and has no deadline meaning that reducing a discrepancy between one's current and desired state is likely to be difficult to achieve. Furthermore, advancement towards some goals may be slow and hard to perceive. For example, someone trying to lose weight cannot easily monitor their advancement on an hourly basis but may need to wait for larger periods of time such as weeks or months. In the case of "being pro-environmental", this time period may be even more substantial. For example, a person may never see any tangible improvement in the environment within their lifetime. In short, it might be expected, therefore, that people may feel a greater need to employ compensatory beliefs for goals that are more distant or difficult to achieve in order to smooth over instances of patchy goal progress (e.g., those occasions where they pursued desires that conflicted with goal progress), as indicated by Study 1.

While abstract or "superordinate" goals can be seen as far from reach it is possible to break these abstract goals down into more concrete and specific actions known as "sub-goals" (Fishbach, Dhar, & Zhang, 2006; Fishbach & Finkelstein, 2010). Take the case of "being pro-environmental". This abstract goal can be broken down into a series of specific actions such as *doing* the recycling or *doing* laundry at 30 degrees. Research by Fishbach et al. (2006) has suggested that when people focus on the successful achievement of a single sub-goal (e.g., having done the recycling) they tend to view other pro-environmental actions as substitutes and are, therefore, less likely to undertake other pro-environmental actions (e.g., also doing laundry at 30 degrees). In contrast, when people consider their commitment to their superordinate goal on the basis of their successful attainment of a sub-goal they are more likely to undertake other actions towards achieving the superordinate goal. To use another environmental example – someone who has just successfully recycled may see this as a sign of their commitment to being pro-environmental, thus, being motivated to also wash their laundry at 30 degrees. In short, Fishbach, Dhar, and Zhang (2006) propose that actions are thought to

signal commitment rather than progress when the goal is seen as distant. Furthermore, they propose that actions signal progress rather than commitment when the focus of the individual is directed at a specific action (Fishbach et al., 2006). The implication for this thesis is that viewing actions as signalling progress to becoming pro-environmental could facilitate licensing and compensating effects resulting in negative spillover effects.

An important element in working towards goals is getting feedback on progress (Fishbach et al., 2010). Someone who was unsuccessful at an interview, for example, might ask for feedback in order that they can adjust their efforts to meet the challenge. While feedback might be given by a person it can also be obtained in other ways. With regard to the environment, for instance, someone might get feedback on their energy saving efforts via an energy monitor or a carbon calculator. Feedback elicits an affective (emotional) response. Positive feedback can make people feel good (e.g., happy or proud), while negative feedback might make someone feel bad (e.g., sad or guilty). Fishbach et al. (2010), therefore, further propose that these affective responses to feedback are actually an underlying mechanism by which feedback influences behavioural responses. In short, Fishbach et al. (2010) argue that feedback should encourage goal pursuit but only when a person feels good and then infers that they are committed to further pursuit of the goal. Similarly, they argue that negative feedback will only be effective in motivating goal pursuit in cases where the person feels bad and attributes the feeling to their lack of progress. This idea clearly relates to the theory tested in Chapters 4 and 5 that negative emotions may prompt reparative or compensatory actions while positive emotions may prompt licensing.

Relatedly, as noted in Section 4.2.5, one potential reason why Study 4 may have failed to replicate the findings of Study 3 was that participants were forced to make a choice (i.e., to recycle or not) and may have not, therefore, felt responsible for the decision. A potential implication of this is that participants may not have questioned their environmental goal progress meaning that they did not feel either motivated to compensate or licensed to act less pro-environmentally. The current chapter will, therefore, extend this previous work by also looking at the effect of goal construal in terms of commitment versus progress.

5.3.Study 6

The design of Study 6 is based on work by Fishbach et al. (2006). In their study, Fishbach et al. (2006) provided gym users with feedback on their workout before looking at whether these individuals would also choose a healthy meal. Participants either completed a survey while resting on a phone book (control condition) or on a 'health and fitness' book which was intended to increase the saliency of these goals. Goal progress was manipulated by allowing participants to see a fictitious participant's responses (exercise 1 hour vs. 10 hours). Where the health goal was superordinate (i.e., the fitness book) and participants construed positive feedback (i.e., that they were doing well because the fictitious participant only exercised for 1 hour) participants expressed a greater interest in eating healthily (positive spillover), whereas, in the absence of the superordinate goal participants expressed less interest in healthy eating (negative spillover).

Study 6 investigates whether construing past pro-environmental actions in terms of goal commitment versus goal progress will have differential outcomes in terms of future interest in being pro-environmental (e.g., when making purchasing decisions). This study used images of print advertisements to manipulate the accessibility of the superordinate goal of "environmental sustainability", before providing participants with the opportunity to reflect on the number of pro-environmental actions they had undertaken in the past six months. Participants were either asked to list 3 or 12 pro-environmental actions. It was anticipated that retrieving from memory 3 examples of pro-environmental actions (especially, being as 1 example was already provided) would be relatively easy, thus allowing participants to construe positive feedback on being pro-environmental (Fishbach & Dhar, 2005; Schwartz, 1998; Schwartz et al., 1991). In contrast it was anticipated that retrieving from memory12 pro-environmental actions would be relatively difficult, leading participants to construe negative feedback on being pro-environmental.

In addition to "environmental sustainability" (in terms of resource conservation values), "status" (in terms of conspicuous consumption and materialistic values) was also primed. Status (in this case as signified by the pursuit of material goods) was chosen as a means of providing contrast with environmental conservation goals. This is because the literature suggests that the two goals are diametrically opposed (Hurst, Dittmar,

Bond, & Kasser, 2013). Hurst et al. (2013, p. 258), for example, argue that materialistic goals such as financial success and fame are "grounded in conspicuous consumption and the accumulation of high status goods" which tend to have a high negative impact on the environment. Furthermore, when material values have been assessed alongside Schwartz' values, they fall next to "Power and Achievement" and opposite to "Universalism" – a value which relates to social justice, equity and valuing the environment (Grouzet et al., 2005). The study hypotheses are summarised in Table 5-1.

While the design of Study 6 closely follows that by Fishbach et al. (2006) the manipulation differs in an important respect. By showing participants a questionnaire partly completed by another (albeit fictional) individual, Fishbach et al. (2006) arguably combine anchoring effects (1 versus 12 hours at the gym) with a subtle manipulation of social comparison. For practical reasons Study 6 was run online and it was not deemed possible to convincingly provide information from a fictional individual. Study 6, therefore, only uses ease of retrieval (for a discussion of these different approaches see, Pahl & Eiser, 2006).

Table 5-1: Experimental Hypotheses

Advancement condition	Advancement on affect	Goals Salient	
		Environmental	Status
Asked to list 3	Advanced (expected to succeed in task and report positive affect)	Commitment inferred Positive spillover (+ → +)	Progress inferred Negative spillover (+ → −)
Asked to list 12	Not advanced (expected to fail in task and report negative affect)	Low commitment inferred Negative spillover (− → −)	Low progress inferred Compensation (− → +)

5.4.Methods

5.4.1. Participants

Participants were University of Sheffield staff and students. The invitation to take part was distributed by email via University mailing lists and contained a link to the online study which was hosted by Qualtrics. Incentives were offered for participation. Students were offered a course credit while staff members were offered the opportunity to enter a

prize draw and to win a £30 Amazon voucher. The study was advertised as consumer research into how people respond to advertisements rather than as an environmental psychology study. The reason for this small deception was twofold. First, it was intended to limit demand characteristics because it was thought that participants' would respond differently to the task (e.g., evaluating the advertisement) if they suspected that it was issued by the Department of Psychology. Second, it was thought that advertising the study as relating to the environment could influence the type of response given (e.g., socially desirable responses) and also the characteristics of the sample (e.g., attracting a disproportionate number of people with an interest in environmental issues).

A total of 705 people responded to the online survey. However, of these, a total of 199 were removed because they did not actually participate in the study while a further 27 were excluded because they provided a largely incomplete data set. Following these exclusions 479 participants remained of whom 145 (30.3%) were male, 332 (69.3%) were female and two (0.4%) described themselves as other. The mean age was 27.59 years (range 17–66 years, *SD* = 11.56). A 2-way ANOVA found no significant differences between conditions in terms of age. The interaction was non-significant, p = .545. There were no significant main effects for goal saliency, p = .877, or advancement, p = .650. Similarly, there were no significant differences in gender between goal saliency conditions, χ^2 (1, n = 477) = .25, p = .620 and advancement conditions, χ^2 (1, n = 477) = .59, p = .441.[25] Finally a two-way ANOVA was conducted to explore the impact of goal saliency and advancement on reported levels of materialistic values. The interaction was non-significant, p = .939. There were no significant main effects for goal saliency, p = 462, or advancement, p = .800.

5.4.2. Study design

An independent measures design was used. The study had a 2 (goal saliency: environment vs. status) x 3 (goal advancement: advanced vs. not advanced) between subject design. Goal saliency was manipulated by an exercise where participants reflected on the messages conveyed by print advertisements, while, goal advancement

[25] Two participants described themselves as other. These participants were in the Status Salient Action Advanced Condition.

was manipulated by asking participants to list 3 (a relatively easy task) or 12 (a relatively difficult task) pro-environmental actions undertaken in the last 6 months.

5.4.3. Piloting stimuli

A total of 28 different print advertisements either relating to status or the environment were selected for piloting by 6 x Level 1 Psychology students. The pilot trial was conducted using Qualtrics. The 28 advertisements were presented in a randomised order. Each advertisement was presented at the top of the page of the online questionnaire. First, participants were asked to briefly describe what the advertisement showed (open response). Next participants were asked: "In your opinion what is the main message being communicated by this advert?" (An open response question). Participants were then asked to respond to a sliding scale where 1 = does not promote at all and 7 = very strongly promotes. The scale items were as follows: "something to aspire to/work towards", "Status goods (e.g., designer brands), "A way of life / lifestyle" and "Environmental sustainability". Participants then responded to another open response question: "Does this advertisement say anything else to you?" Finally participants were asked what words they associated with the brand being advertised. An image of the survey as seen by the participants is presented in Figure 6, p.117. The mean scores for environmental sustainability vs. status can be seen in Appendix Four – Study 6.

Advertisements used: From the initial set of 28 advertisements, 4 were selected for the main study (see Figure 7 below). The set of environmental sustainability advertisements comprised: 1) an advertisement from the World Wildlife Fund showing a part-human part-fish creature alongside a message about climate change and 2) an advertisement from Greenpeace showing a woman with a sign containing a message about the woman's actions to protect the rainforest. The status set comprised: 1) an advertisement from Dior showing a woman with a luxury designer watch and 2) an advertisement by Polo showing a sportsman with a luxury designer bottle of fragrance. The images were selected because they had either been rated as strongly promoting environmental sustainability or status and because they had a number of features in common. For example, both females are directly facing the camera, both wear dark coloured clothes, have blond hair and are presented with text. Both males are wearing blue shirts, are presented on a coloured background and with text on their chests.

The 6 participants rated the extent to which each advertisement promoted environmental sustainability versus status goods. A 2 (type of advertisement: environmental vs. status) x 2 (activated issue: environmental vs. status) within participants ANOVA was conducted. As expected, there was a significant interaction between the nature of the advertisement and the activated issue, $F(1,5) = 228.10$, $p < .001$. The advertisements that reflected pro-environmental issues were judged as more likely to reflect environmental concerns ($M = 6.67$, $SD = 0.52$), than the advertisements that reflected status ($M = 1.00$, $SD = 0.00$), $F(1, 5) = 722.50$, $p < .001$. Conversely, the two advertisements that the author believed to reflect status/conspicuous materialism were indeed judged by participants to be more likely to promote status goods ($M = 6.00$, $SD = 0.89$) than the advertisements that the author believed to promote pro-environmental issues ($M = 1.17$, $SD = 0.41$), $F(1, 5) = 89.47$, $p < .001$ ($\eta_p^2 = .99$).

5.4.4. Materials: main study

Advertisements: Participants were presented with a series of open response questions in relation to either the status advertisements or the environmental sustainability advertisements (they did not see both sets of images). The questions included the name of the brand or organisation being shown to ensure that this was made obvious to participants. Participants, for example, were asked to "briefly describe what this Ralph Lauren advert shows". Participants were then asked: "In your opinion what is being communicated by this Ralph Lauren advert?" and "What words do you associate with Ralph Lauren? Please list as many as you can".

Advancement measure: Participants were either asked to list either 3 or 12 pro-environmental actions undertaken in the past 12 months. These questions were introduced with the following introduction: "The next few questions relate to your emotions and lifestyle choices. We would like to know about the activities you undertake which benefit the environment in some way". The question was worded as follows: "Please list three/twelve ways in which you have acted to benefit the environment in the last 6 months (e.g., wash laundry at 30 degrees)". A form with either 3 or 12 numbered lines was provided beneath the question.

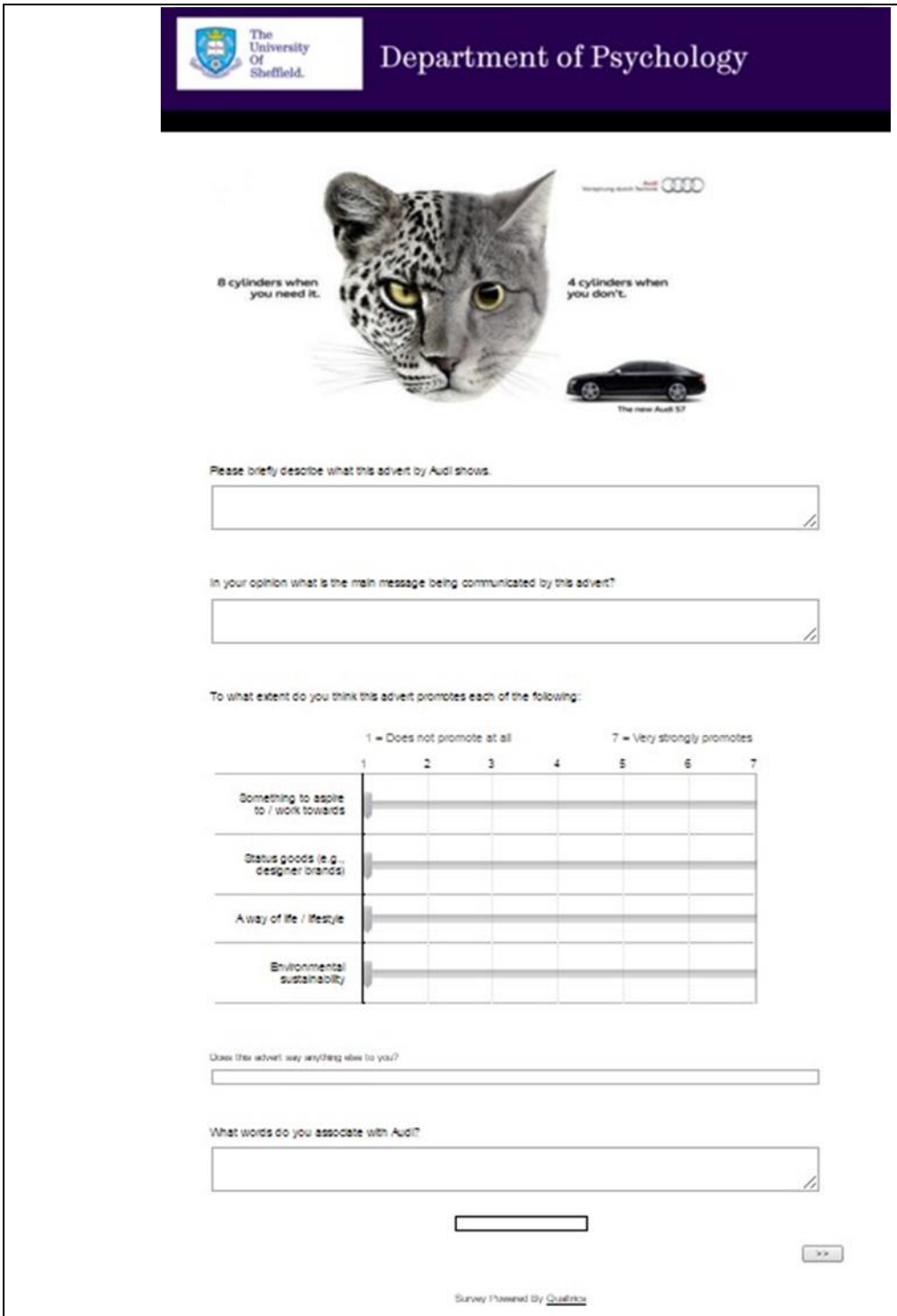


Figure 6: Screen shot of questionnaire as seen by participants

Environmental

Status

Figure 7: Images used to make environmental sustainability and status salient

The Positive and Negative Affect Schedule (PANAS): Participants' emotional responses were assessed using the PANAS scale (Watson, Clark, & Telleger, 1988). The scale was comprised of 10 positive emotions (Cronbach's α = .91) and 10 negative emotions (Cronbach's α = .89). Responses were given on a 5-point Likert scale with 1 being "very slightly or not at all", 3 being "moderately" and 5 being "extremely". Participants were asked to indicate to what extent they were experiencing the emotions at the present moment. This measure was included to assess whether participants assigned the relatively easy task of listing 3 pro-environmental behaviours would report higher positive affect than participants given the more challenging task of listing 12 pro-environmental behaviours.

Measure of progress vs. commitment: Two items were included as a manipulation check for goal commitment vs. goal progress in relation to environmental impact reduction. One item was designed to assess goal progress and one item was designed to

assess goal commitment. The items were as follows: "I am committed to reducing my environmental impacts" and "To date, I feel that I have made good progress toward reducing my environmental impacts". Responses were anchored on a 7-point Likert Scale with strongly disagree to strongly agree options and a neither agree nor disagree midpoint.

Measures of intention: Participants saw two items intended to assess the impact of goal priming and progress on levels of intention to consider and reduce environmental impacts. The items were as follows: "I intend to reduce my impact on the environment over the next 6 months" and "Over the next 6 months, I plan to think about how my actions affect the environment". Responses were anchored on a 7-point Likert Scale with strongly disagree to strongly agree options and a neither agree nor disagree midpoint.

Purchasing decision: The main dependent variable was an assessment of participants' preferences for status versus sustainability features on a car.

For this task participants were asked to think about making a significant purchasing decision – namely investing in a new car. Cars can be thought of as status symbols (e.g., sign of affluence/luxury) but they can also offer opportunities for people to demonstrate their commitment to reducing negative environmental impacts (e.g., by selecting a car with eco-features or choosing hybrid or electric vehicles). In line with the literature on compensating and licensing, it was anticipated that participants who felt they had made sufficient progress in being pro-environmental would be more likely to license expressing a preference for luxury car features (e.g., speed), while participants who felt greater environmental commitment or the need to compensate for poor progress would express a stronger preference for eco-features. The following text introduced the task:

> The cost of buying a car has risen from £12,207 in 1988 to around £27,219 today. Buying a new car, therefore, constitutes a significant investment for most people. We would like you to imagine that you are buying a new car.

The task was to: "rate how important the following features would be in making your decision to invest in a new car" using a 7-point sliding scale. The items were anchored as follows: 1 = "Not at all important" and 7 = "Extremely important". Features included four pro-environmental items (low CO_2 emissions, brake energy regeneration, stop-start systems and fuel efficiency), four status related items (top speed, luxury upholstery,

colour and style and air conditioning) and four filler items (e.g., storage space). Items were allocated to these categories by the author and category choices were confirmed by the author's supervisors. Eco preference scores were calculated by summing responses to these 4 items. Similarly, status preference was calculated by summing responses to the 4 status items. Higher scores were taken as an indication of stronger preferences for these concepts. Figure 8 provides an image showing the appearance of the scale.

Basic demographics: Questions included "How old are you?" (Open response) and "Which one of the following most accurately describes you?" (Male/Female/Other).

Material Values: The materialism scale developed by Richins and Dawson (1992) was included in the study. This scale aims to tap into three important sets of beliefs associated with materialism. These are that: 1) possessions constitute "success" in that they are indicators of one's achievements (e.g., prosperity); 2) that material goods give meaning to life and; 3) that possessions are essential to life satisfaction (Beardon & Netemeyer, 1999). The scale consists of 18 items which are scored on a 5-point Likert scale anchored by "strongly agree" and "strongly disagree". Scores are summed to make an overall materialism score. Items include statements such as "I usually buy only the things I need" (Reverse coded).

5.4.5. A Summary of the Procedure

The study was advertised as relating to consumer research being conducted by a member of academic staff at Sheffield University Management School. The cover letter (sent by email) introduced the purpose of the study as follows: "We would greatly appreciate your help in this study of peoples' responses to advertisements".

Participants were randomly (using Qualtrics survey software) allocated to see two advertisements relating to environmental sustainability or to status goods. Participants were then asked to describe the advertisements, summarise what message the advertisements conveyed and list the words they associated with the organisations which had produced the advertisements. The aim of the exercise was to make either pro-environmental or status seeking goals salient.

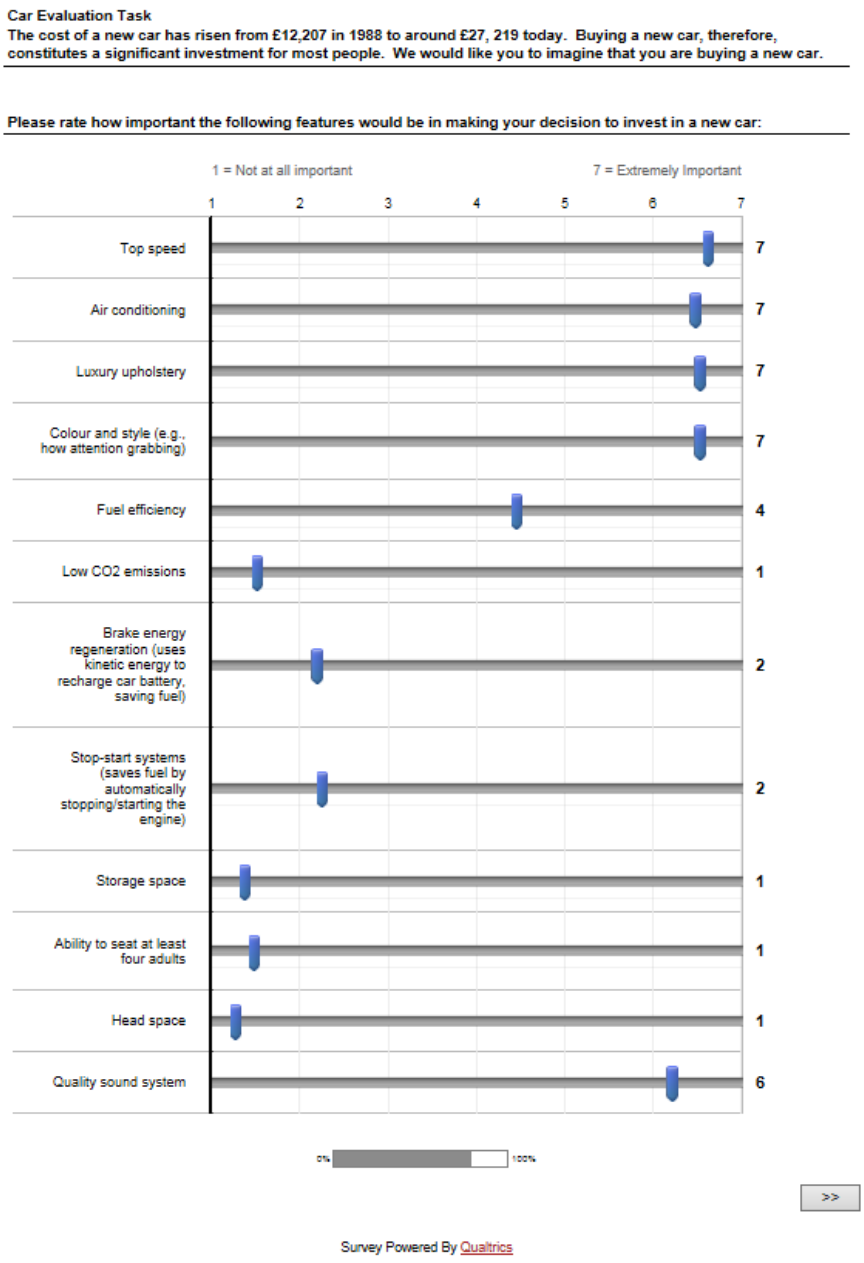


Figure 8: Screenshot of car evaluation task

Participants were randomly allocated to one of two feedback conditions the purpose of which was to manipulate perceptions of advancement towards pro-environmental goals. Participants were either asked to list 3 or 12 pro-environmental actions which they had undertaken in the last 6 months. It was anticipated that listing 3 actions was would be easy (especially as the example of washing at 30 degrees has been provided), thus, giving participants positive information about their advancement towards the goal of environmental sustainability (action advanced manipulation). In contrast, it was anticipated that listing 12 actions would be more difficult, thus giving participants'

negative information about their progress towards the goal of environmental sustainability (action not advanced manipulation).

Three factors were measured following the listing exercise which were: affect (positive and negative), and self-report measures of commitment to being pro-environmental, and progress in being pro-environmental to date. The main dependent variables were intention to benefit the environment in future and preference for car eco features versus status features on a car evaluation task. Finally, participants were presented with a written debrief which explained the purpose of the study.

5.5.Results

An unforeseen challenge with the experimental design was discovered when looking at how many pro-environmental actions participants succeeded in listing. While it had been anticipated that listing 12 pro-environmental actions would be difficult and that most participants would fail to do so, this was not actually the case. Instead, it was found that 126 participants or 53.84% of the action not advanced condition succeeded in listing 12 pro-environmental behaviours (M = 9.23, SD = 3.57). While it could be the case that these participants still found the exercise challenging, there is a clear risk that they also inferred positive advancement because of their success. Caution should, therefore, be employed when interpreting the results of this study.

5.5.1. Checking Randomisation was effective

A 2 (goal prime: environment vs status) x 2 (Advancement: list 3 vs list 12) between subjects ANOVA was conducted to explore whether participants differed between conditions in terms of age. The interaction was non-significant, $F(1, 474) = .366$, $p = .545$ and there were no significant main effects for goal saliency, $F(1, 474) = .02$, $p = .877$, or advancement, $F(1, 474) = .21$, $p = .650$. Two Chi-square tests (with Yates Continuity Correction) were conducted to investigate whether there was an equal number of males and females in each condition. Participants did not differ significantly by sex in the goals salient condition, $\chi^2 (1, 477) = 16$, $p = .692$, or the advancement condition, $\chi^2 (1, 477) = 45$, $p = .502$. A 2x2 between subjects ANOVA was conducted to explore the impact of goal saliency and advancement on levels of materialistic values. The interaction was non-significant, $F(1, 425) = .01$, $p = .939$ and there were no

significant main effects for goal saliency, $F(1, 425) = .542$, $p = .462$, or advancement, $F(1,425) = .06$, $p = .800$. To summarise, the randomisation function provided by Qualtrics appeared to have been effective.

5.5.2. Manipulation Checks

First, it had been predicted that if the manipulation was effective, participants asked to list 3 actions would report significantly higher levels of positive affect. A 2 (goal prime: environment vs status) x 2 (Advancement: list 3 vs list 12) between subjects ANOVA, was therefore, conducted to explore the impact of goal saliency and advancement on levels of positive affect. The interaction was non-significant, $F(1, 473) = .31$, $p = .577$, and there were no significant main effects for either goal saliency, $F(1, 473) = .04$, $p = .844$, or advancement, $F(1, 473) = .11$, $p = .737$.

Second, it had been predicted that if the manipulation was effective participants asked to list 12 actions would report significantly higher levels of negative affect (because the task was expected to be difficult). A 2x2 between subjects ANOVA was conducted to explore the impact of goal saliency and advancement on levels of negative affect. The interaction was non-significant, $F(1, 473) = .21$, $p = .651$. Furthermore, there were no significant main effects for goal saliency, $F(1, 473) = .015$, $p = .902$, or advancement, $F(1, 473) = .32$, $p = .572$.

Third, if the manipulations were effective, it was predicted that participants in the environmental goals salient conditions (both advanced and non-advanced) should report higher levels of commitment to the environment than other participants. A 2x2 between subjects ANOVA was conducted, therefore, to explore the impact of goal saliency and advancement on levels of commitment. The interaction was significant, $F(1, 475) = 3.89$, $p = .049$, with a small effect size ($\eta_p^2 = .01$). For people for whom the environment was made salient, feeling they had advanced (i.e., because listing 3 actions was relatively easy) resulted in higher levels of commitment. However, for people for whom status was made salient the opposite pattern can be seen. There were, however, no significant main effects for goal saliency, $F(1, 475) = 1.06$, $p = .305$, or advancement, $F(1, 475) = .439$, $p = .508$.

Fourth, if the manipulation was effective then it was predicted that participants in the status goal salient action advanced condition would report significantly greater feelings

of progress than participants in other conditions. A 2x2 between subjects ANOVA was conducted, therefore, to explore the impact of goal saliency and advancement on levels of progress. The interaction was, however, non-significant, $F(1, 475) = .16$, $p = .690$. There were no significant main effects for goal saliency, $F(1, 275) = .12$, $p = .735$, or advancement, $F(1, 475) = .23$, $p = .634$.

Overall these results indicate that the manipulations were not effective.

5.5.3. Main results (investigating original hypotheses)

It was predicted that participants in the action advanced (list 3) environmental goals salient and action not advanced (list 12) status goal salient conditions would express significantly stronger intentions to be pro-environmental in future. The former group were expected to show positive spillover, while the later were expected to desire to compensate. A 2x2 between subjects ANOVA was conducted, therefore, to explore the impact of goal saliency (environment vs status) and advancement (list 3 vs list 12) on levels of pro-environmental intention. The interaction was non-significant, $F(1, 475), = .36$, $p = .548$. Furthermore, there were no significant main effects for either goal saliency, $F(1, 475) = .03$, $p = .867$, or advancement, $F(1, 475) = .63$, $p = .430$. No evidence of positive spillover or compensation was found.

Similarly, it was predicted that participants in the action advanced (list 3) environmental goals salient and action not advanced (list 12) status goal salient conditions would express significantly stronger intentions to think about how their actions would affect the environment. A 2x2 between subjects ANOVA was conducted to explore the impact of goal saliency and advancement on levels of pro-environmental intention. The interaction was non-significant, $F(1, 475) = 2.58$, $p = .109$. There were no significant main effects for either goal saliency, $F(1, 475) = 2.14$, $p = .144$, or advancement, $F(1, 475) = 2.14$, $p = .440$.

Again, it was predicted that participants in the action advanced (list 3) environmental goals salient and action not advanced (list 12) status goal salient groups would express significantly stronger preferences for car eco-features. The former group was expected to show positive spillover, while the later was expected to show evidence of compensation. Unfortunately, these effects were not found. A 2x2 between subjects ANOVA conducted to explore the impact of goal saliency and advancement on strength

of preference for car eco-features found the interaction to be non-significant, $F(1, 475) = .68$, $p = .411$. There were no significant main effect for goal saliency, $F(1, 475) = .08$, $p = .774$, or advancement, $F(1, 475) = .001$, $p = .980$.

It might be expected that some participants would express stronger preferences for status features (e.g., participants in the action advanced status primed condition). A 2x2 between subjects was, therefore, conducted to investigate whether there were any differences between conditions. The interaction was non-significant, $F(1, 475) = .1.81$, $p = .180$, and there were no significant main effect for goal saliency, $F(1, 475) = .18$, $p = .680$, or advancement, $F(1, 475) = .37$, $p = .545$.

Table 5-2 Descriptive statistics (2 levels of advancement)

		Goals Salient			
		Environmental		Status	
Condition	Measure	Mean (SD)	N	Mean (SD)	N
List 3 (Advanced)	Commitment	5.43 (1.25)	113	5.08 (1.34)	132
	Progress	4.84 (1.31)	113	4.83 (1.35)	132
	Positive affect	25.57 (7.86)	113	24.99 (7.96)	131
	Negative affect	14.50 (6.00)	113	14.33 (5.30)	131
	Intention reduce impact	4.91 (1.35)	113	4.86 (1.38)	132
	Considering impacts	5.11 (1.37)	113	4.70 (1.49)	132
	Car eco preference	4.98 (1.48)	113	5.05 (1.38)	132
	Car status preference	3.01 (1.29)	113	3.12 (1.26)	132
	Age	28.06 (12.60)	113	27.58 (10.73)	132
	Materialism	58.98 (9.93)	113	58.23 (9.73)	132
List 12 (Not advanced)	Commitment	5.12 (1.31)	109	5.23 (1.40)	125
	Progress	4.73 (1.33)	109	4.82 (1.33)	125
	Positive affect	25.40 (8.33)	108	25.67 (8.91)	125
	Negative affect	14.56 (5.85)	108	14.87 (6.13)	125
	Intention reduce impact	4.73 (1.37)	109	4.83 (1.46)	125
	Considering impacts	4.79 (1.42)	109	4.81 (1.52)	125
	Car eco preference	5.08 (1.41)	109	4.94 (1.36)	125
	Car status preference	3.24 (1.29)	109	3.04 (1.30)	125
	Age	26.94 (11.47)	108	27.74 (11.63)	125
	Materialism	58.68 (9.89)	109	58.07 (10.57)	125

5.5.4. Re-running the analyses (with revised hypotheses)

It was found that 126 participants or 53.84% of the action not advanced condition actually succeeded in listing 12 pro-environmental behaviours (as outlined above). The resulting analyses suggest that the manipulation of advancement was unsuccessful. For example, only one interaction was found and the effect size was small. For this reason the decision was made to divide the participants into 3 groups as follows. All 126 participants who completed listing 12 pro-environmental behaviours were coded as 1 (highly advanced in goal pursuit), all 103 participants who did not succeed in listing 12 pro-environmental behaviours were coded as 2 (not advanced in goal pursuit), and finally all 245 participants in the action advanced (list 3) condition were coded as 3 (advanced in goal pursuit). This variable will be referred to as Advancement-3levels.

Tests were repeated to ensure that the new groups did not differ in terms of materialistic values, age and sex. A 2x3 between subjects ANOVA was conducted to explore the impact of goal saliency and advancement on reported levels of materialistic values. The interaction was non-significant, $p = .268$. There were no significant main effects for goal saliency, $p = 520$, or Advancement-3levels, $p = .830$. A 2x3 between subjects ANOVA was conducted to explore the impact of goal saliency and advancement on participants' age. The interaction was non-significant, $p = .543$. There were no significant main effects for goal saliency, $p = 647$, or Advancement-3levels, $p = .766$. Neither did participants differ significantly by sex (male and female) within the goal salient conditions, $\chi^2(1, n = 477) = .25$, $p = .620$, or the Advancement-3levels, $\chi^2(2, n = 472) = 1.36$, $p = .506$.

It was predicted that participants who has succeeded in listing 12 pro-environmental behaviours would respond in a similar manner to participants in the action advanced (list 3) group. However, as these participants had achieved a more challenging task it was thought that they may report relatively higher levels of positive affect and show more pronounced licensing and compensating effects (e.g., higher reported intention relative to the other groups). The hypotheses are provided in Table 5-3.

Table 5-3 Summary of Revised Hypotheses

Advancement condition	Advancement level on affect	Goals Salient	
		Environmental	Status
Asked to list 12	Highly Advanced (listed 12, expected high positive affect)	High commitment inferred Positive spillover (+ → +)	High progress inferred Negative spillover (+ → −)
	Not advanced (did not list 12, expected negative affect)	Low commitment inferred Negative spillover (− → −)	Progress inferred Compensation (− → +)
Asked to list 3	Advanced (listed 3-11 actions, expected positive affect)	Commitment inferred Positive spillover (+ → +)	Progress inferred Negative spillover (+ → −)

Commitment to reducing environmental impact: first a 2 (goal prime: environment or status salient) x 3 (Advancement-3levels) between-subjects ANOVA was conducted to investigate participants' level of commitment to reducing their environmental impacts. The goal priming x advancement interaction was not statistically significant, $F(2, 468) = 2.36$, $p = .096$. There was a significant main effect for Advancement-3levels $F(2, 468) = 6.12$, $p = .002$; however, the effect size was small ($\eta_p^2 = .03$). Post-hoc comparisons using the Bonferroni test indicated that the mean score for the failure to list 12 actions group (not advanced) ($M = 4.90$, $SD = 1.34$) was significantly different to the succeeded in listing 12 group (very advanced) ($M = 5.48$, $SD = 1.19$). The list 3 group (action advanced) did not differ significantly from the highly advanced ($p = .232$ and not advanced groups ($p = .067$). The main effect for goal saliency, $F(1, 468) = .088$, $p = .766$ did not reach significance. These results suggest 1) that goal saliency had no effect on goal construal and 2) that participants who succeeded in listing 12 actions inferred significantly higher goal commitment than participants who had been unable to list 12 actions (positive spillover).

Progress towards being environmental: Next, a 2 (goal prime: environment or status salient) x 3 (Advancement-3levels) between-subjects ANOVA was conducted to investigate participants' level of perceived progress to date in reducing their environmental impacts. The goal saliency x Advancement-3levels interaction was not statistically significant, $F(2, 468) = .26$, $p = .772$. Again, there was a significant main effect for Advancement-3levels $F(2, 468) = 5.99$, $p = .003$ with a small effect size ($\eta_p^2 =$

.03). Post-hoc comparisons using the Bonferroni test indicated that the mean score for failure to list 12 actions group (not advanced) (M = 4.48, SD = 1.27) was significantly different to the succeeded in listing 12 group (very advanced) (M = 5.08, SD = 1.29). The list 3 group (action advanced) did not differ significantly from the highly advanced and not advanced groups. The main effect for goal saliency, $F(1, 468) = .29$, $p = .593$, did not reach significance. Again, these results suggests that the manipulation of goal saliency was ineffective and that the study only succeeded in manipulating perceptions of goal progress, with the highly advanced group, reporting significantly greater perceptions of progress.

5.5.5. Main results (with revised hypotheses)

It had been predicted that participants in the environment salient action advanced condition along with participants in the status salient action not advanced condition would report significantly higher levels of pro-environmental intention and interest in being pro-environmental in the future. Two items were used to assess intention. These are analysed separately.

Intention: A 2 (goal prime: environment or status salient) x 3 (Advancement-3levels) between-subjects ANOVA was conducted on participants' reported level of intention to reduce their impacts on the environment. The interaction effect between goal saliency and Advancement-3levels was not statistically significant, $F(2, 468) = .57$, $p = .564$. There was a statistically significant main effect for Advancement-3levels, $F(2, 468) = 3.42$, $p = .034$; however, the effect size was small ($\eta_p^2 = .01$). Post-hoc comparisons using the Bonferroni test indicated that the mean score for failure to list 12 actions group (not advanced) (M = 4.56, SD = 1.30) was significantly different to the succeeded in listing 12 group (highly advanced) (M = 5.04, SD = 1.38). The list 3 group (action advanced) did not differ significantly from the very highly advanced (p = 867) and not advanced groups (p = .137). The main effect for goal saliency, $F(1, 468) = .07$, $p = .790$, did not reach significance. Once more there was a significant main effect for advancement $F(2,468) = 3.42$, $p = .034$ with a small size ($\eta_p^2 = .01$). Again, participants who succeeded in listing 12 actions reported significantly higher intentions to be pro-environmental (positive spillover).

Considering environmental impacts: A 2 (goal prime: environment or status salient) x 3 (Advancement-3levels) between subjects ANOVA exploring participants' plans to think

about how their actions will affect the environment was conducted. The interaction effect between goal saliency and Advancement-3levels was not statistically significant, $F(2, 468) = 1.79$, $p = .169$. There was a statistically significant main effect for Advancement-3levels, $F(2, 468) = 5.18$, $p = .006$; however, the effect size was small ($\eta_p^2 = .02$). Post-hoc comparisons using the Bonferroni test indicated that the mean score for failure to list 12 actions group (not advanced) ($M = 4.50$, $SD = 1.34$) was significantly different to the succeeded in listing 12 group (highly advanced) ($M = 5.11$, $SD = 1.46$). The list 3 group (action advanced) did not differ significantly from the very advanced ($p = .450$) and not advanced groups ($p = .060$). The main effect for goal saliency, $F(1, 468) = .54$, $p = .463$, did not reach significance. Once again, a positive spillover effect is suggested as participants who succeeded in listing 12 pro-environmental behaviours report significantly greater intentions to consider their environmental impacts in future.

Preference for car eco-features in a purchasing decision: Next the main hypotheses were tested which were that: 1) participants in the environment salient action advanced conditions would show positive spillover as indicated by a stronger preference for car eco features; 2) that participants in the environment salient action not advanced condition would show negative spillover as indicated by a weaker preference for car eco-features; 3) that participants in the status salient action advanced condition would show compensation (i.e., balancing) by having a weaker preference for car eco features; and 4) that participants in the status salient action not advanced condition would show compensatory behaviour by having a strong preference for car eco features. These hypotheses were not supported by the data.

A 2 (goal prime: environment or status salient) x 3 (Advancement-3levels) between subjects ANOVA was conducted on participants' preference for car eco features. The interaction effect between goal saliency and Advancement-3levels was not statistically significant, $F(2, 468) = .19$, $p = .827$. There was no significant effect for Advancement-3levels, $F(2, 468) = 2.10$, $p = .124$. There was also a no significant main effect for goal saliency, $F(1, 468) = .03$, $p = .861$.

Car status features: Participants' preference for car status features were also assessed using a 2 (goal prime: environment or status salient) x 3 (Advancement-3levels) between subjects ANOVA. The interaction effect between goal saliency and Advancement-3levels was not statistically significant, $F(2, 468) = 1.31$, $p = .272$. There

was no significant effect for Advancement-3levels, $F(2, 468) = .72$, $p = .489$. There was also no significant main effect for goal saliency, $F(1, 468) = 1.02$, $p = .312$.

Table 5-4: Descriptive statistics (advancement 3 levels)

		Goals Salient Environmental		Status	
Condition	Measure	Mean (SD)	N	Mean (SD)	N
List 12 (complete)	Commitment	5.38 (1.16)	65	5.59 (1.23)	61
	Progress	4.98 (1.22)	65	5.18 (1.37)	61
	Positive affect	25.65 (7.97)	65	28.28 (8.48)	61
	Negative affect	14.12 (5.77)	65	13.84 (4.82)	61
	Pride	2.40 (1.16)	65	2.57 (1.18)	61
	Guilt	1.48 (.81)	65	1.39 (.71)	61
	Intention reduce impact	4.92 (1.34)	65	5.16 (1.43)	61
	Considering impacts	5.03 (1.33)	65	5.20 (1.59)	61
	Car eco preference	5.25 (1.32)	65	5.13 (1.34)	61
	Car status preference	3.18 (1.18)	65	2.85 (1.15)	61
	Age	25.83 (10.74)	65	28.07 (10.94)	61
	Materialism	58.14 (10.08)	65	59.72 (9.69)	61
List 12 (failed to complete)	Commitment	4.88 (1.29)	41	4.92 (1.38)	62
	Progress	4.46 (1.36)	41	4.48 (1.21)	62
	Positive affect	25.63 (8.70)	41	23.03 (8.72)	62
	Negative affect	15.27 (6.11)	41	15.69 (6.92)	62
	Pride	2.34 (1.09)	41	2.03 (1.24)	62
	Guilt	1.76 (1.16)	41	1.61 (.86)	62
	Intention reduce impact	4.61 (1.24)	41	4.53 (1.34)	62
	Considering impacts	4.54 (1.43)	41	4.47 (1.29)	62
	Car eco preference	4.82 (1.55)	41	4.79 (1.32)	62
	Car status preference	3.30 (1.48)	41	3.13 (1.34)	62
	Age	28.00 (12.07)	41	27.69 (12.45)	62
	Materialism	59.49 (9.76)	41	56.73 (11.31)	62
List 3	Commitment	5.43 (1.13)	113	5.08 (1.34)	132
	Progress	4.84 (1.31)	113	4.83 (1.35)	132
	Positive affect	25.57 (7.86)	113	24.99 (7.96)	131
	Negative affect	14.50 (6.00)	113	14.33 (5.30)	131

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Pride	2.10 (1.07)	113	2.18 (1.18)	131
Guilt	1.42 (.68)	113	1.50 (.96)	131
Intention reduce impact	4.91 (1.35)	113	4.86 (1.38)	132
Considering impacts	5.11 (1.37)	113	4.70 (1.49)	132
Car eco preference	4.98 (1.48)	113	5.05 (1.38)	132
Car status preference	3.01 (1.29)	113	3.12 (1.26)	132
Age	28.06 (12.60)	113	27.58 (10.73)	132
Materialism	58.98 (9.93)	113	58.23 (9.73)	132

5.5.6. Exploring the role of affect

Based on the literature it was been expected that mood would underlie the impact of feedback on goal pursuit (in this case whether participants were led to infer that they were advancing towards environmental goals or not). Participants in the action advanced conditions were predicted to report significantly higher levels of positive affect, while participants in the not advanced conditions were predicted to report significantly higher levels of negative affect. The prediction for positive affect only was supported by the data.

Positive affect: Participants' reported feelings of positive affect were assessed using a 2 (goal prime: environment or status salient) x 3 (Advancement-3levels) between subjects ANOVA. This found a significant interaction effect between goal saliency and Advancement-3levels, $F(2,467) = 3.02$, $p = .050$, although the effect size was small ($\eta_p^2 = .01$). A plot showing the interaction indicated that participants in the Status goals salient condition who succeeded in listing 12 pro-environmental actions appeared to feel considerably more positive than other participants. There was a statistically significant main effect for Advanced-3levels, $F(2, 467) = 3.11$, $p = .050$. Post-hoc comparisons using the Bonferroni test revealed that the group who succeeded in listing 12 actions were significantly different ($M = 26.92$, $SD = 8.92$) to the group that failed to list 12 actions ($M = 24.07$, $SD = 8.76$). There was no main effect for goal saliency, $F(1, 467) = .05$, $p = .824$. As before these results suggest that participants who inferred that they were advancing towards pro-environmental goals (i.e., those who succeeded in listing 12 actions) reported significantly higher positive affect. Interestingly, however, it

appears that participants in the status goal salient (rather than the environmental) condition who listed 12 actions felt particularly positive.

Negative affect: Participants' reported feelings of negative affect were also assessed using a 2 (goal prime: environment or status salient) x 3 (Advancement-3levels) between subjects ANOVA. The interaction effect between goal saliency and Advancement-3levels was not statistically significant, $F(2, 467) = .12$, $p = .885$. There was no significant effect for Advancement-3levels, $F(2, 467) = 1.95$, $p = .143$. There was also no significant main effect for goal saliency, $F(1, 467) = .00$, $p = .982$.

5.5.6.1. Exploring the role of affect as a mediator

It had been expected that mood would underlie the impact of feedback on goal pursuit (in this case whether participants were led to infer that they were advancing towards environmental goals or not). Pride and guilt were, therefore, investigated as mediators of the relationship between level of advancement (completed vs not-completed among participants asked to list 12 actions) and intention to act pro-environmentally using the PROCESS macro (Hayes, 2012). The decision was taken to focus exclusively on the participants asked to list 12 behaviours and to exclude those asked to list only 3 behaviours. The reason for this was that the participants who listed only 3 actions (action advanced) did not differ significantly on any of the assessed measures compared with not advanced and highly advanced groups. It was also decided to focus on intention to be pro-environmental rather than preference for car eco features because: 1) this measure seems to be problematic (see section 5.6) and b) earlier analysis of this measure found no significant differences between conditions using this measure (see section 5.5.5).

The following paragraphs will present a series of 4 simple mediation analyses. As this thesis research has focused on pride and guilt the role of these emotions as potential mediators of intention will be considered in some detail. In addition, because Fishbach et al. (2006) and Fishbach et al. (2010) look at positive and negative affect more generally two further mediation analyes will be conducted to investigate whether similar findings emerge.

Pride: First, a simple mediation analysis was conducted to establish whether the relationship between advancement and strength of pro-environmental intention was

mediated by pride. Advancement was dummy coded (1 = list 12, 0 = fail to list 12). As can be seen in Figure 9 and Table 5-5, participants who succeeded in listing 12 pro-environmental behaviours reported feeling higher levels of pride (a = .28), and participants who felt more pride expressed stronger intentions to be pro-environmental in future (b = .13). A bias-corrected bootstrap confidence interval for the indirect effect (ab = .04) based on 10,000 bootstrap samples was entirely above zero (.00 to .10).[26] There was evidence that advancement influenced intention independent of its effect on pride ($c' = .31$, p = .018).

Guilt: A second simple mediation analysis was conducted to establish whether the relationship between advancement and strength of pro-environmental intention was mediated by guilt. As before, advancement was dummy coded (1 = list 12, 0 = fail to list 12). As can be seen in Figure 10 and Table 5-6, participants who succeeded in listing 12 pro-environmental behaviours reported feeling lower levels of guilt (a = -.27). However, there was no significant relationship between participants who experienced more guilt and stronger intentions to be pro-environmental in future (b = .06). A bias-corrected bootstrap confidence interval for the indirect effect (ab = -.02) based on 10,000 bootstrap samples contained zero (-.07 to .01). There was evidence that advancement influenced intention independent of its effect on guilt (c' = .36, p = .006). In short, guilt was not found to mediate pro-environmental intention.

As previous studies within this thesis had looked at pride and guilt specifically the results for these items are have been presented in some detail. However, as Fishbach et al. (2006) and Fishbach et al. (2010) focus on positive and negative affect more generally, the analyses were repeated with the complete measures of positive and negative affect of which pride and guilt were single scale items. The same patterns were found to emerge, positive but not negative affect mediated pro-environmental intention.

Positive affect: Participants who listed 12 pro-environmental behaviours reported higher positive affect (a = .35). There was a significant relationship between positive affect and stronger intentions to be pro-environmental in future (b = .27). A bias-corrected bootstrap confidence interval for the indirect effect (ab = .09) based on 10,000

[26] Before rounding to 2 decimal places the lower confidence interval was .0021 and the upper confidence interval was .1028.

bootstrap samples was entirely above zero (.03 to .20). There was evidence that advancement influenced intention independent of its effect on positive affect (c' =.25, p = .047). Further details for this analysis can be seen in Table 5-7.

Negative affect: Participants who listed 12 pro-environmental behaviours reported lower levels of negative affect (a = -.27). There was no significant relationship between negative affect and stronger intentions to be pro-environmental in future (b = .03). A bias-corrected bootstrap confidence interval for the indirect effect (ab = -.01) based on 10,000 bootstrap samples was included zero (-.06 to .02). There was evidence that advancement influenced intention independent of its effect on negative affect (c' =.35, p = .007). Further details for this analysis can be seen in Table 5-8.

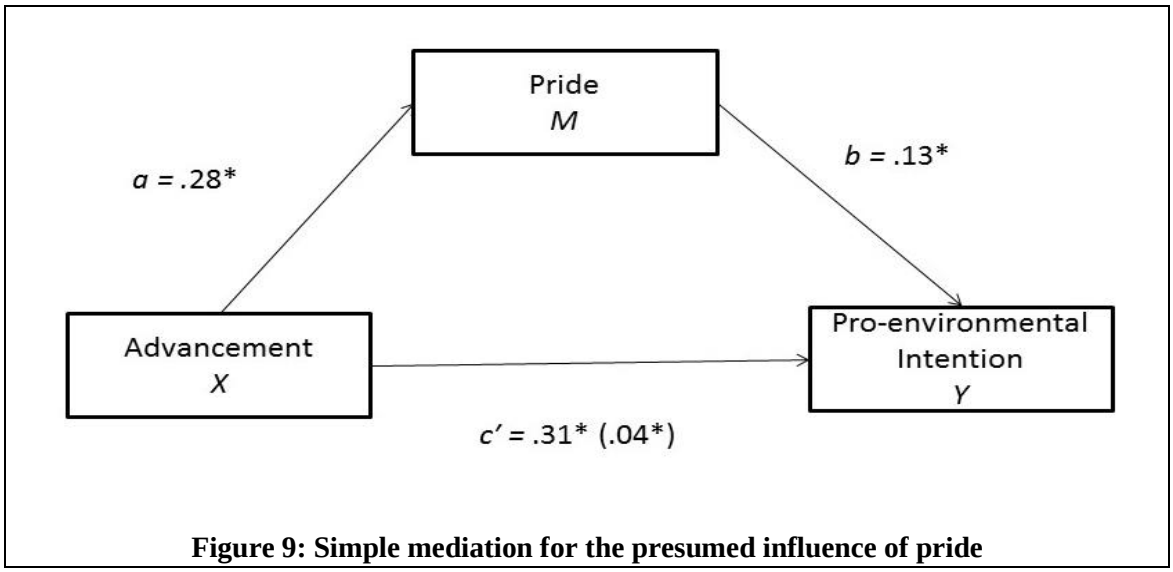

Figure 9: Simple mediation for the presumed influence of pride

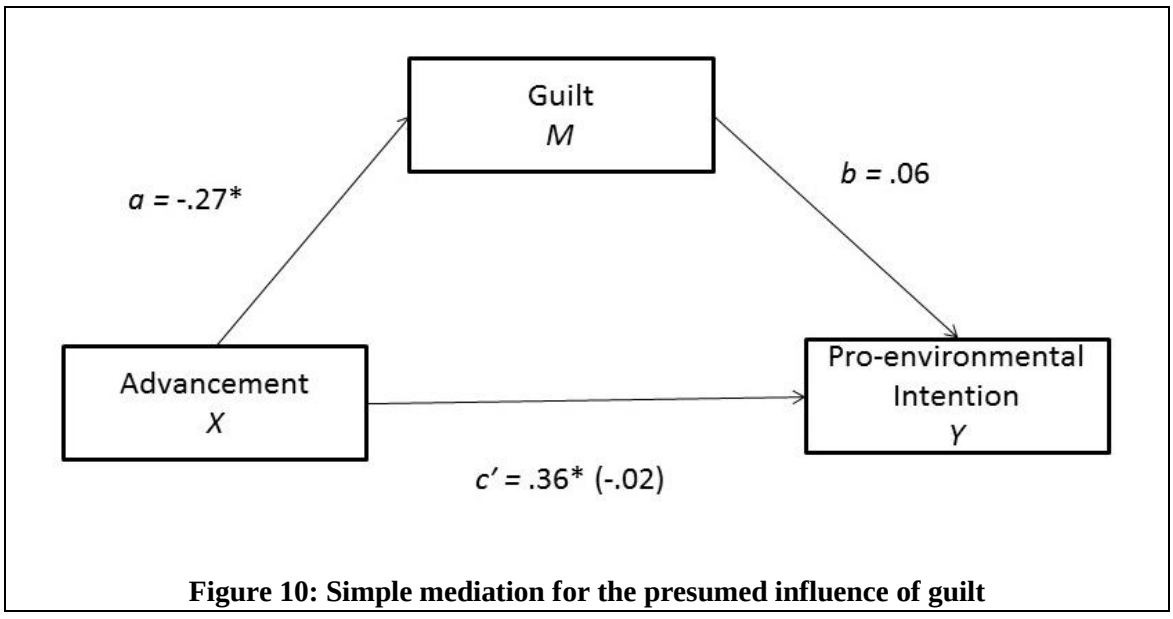

Figure 10: Simple mediation for the presumed influence of guilt

Table 5-5. Simple Mediation: Pride on pro-environmental intention

		Consequent						
		Mediator (Pride)				Y (Intention)		
Antecedent		Coeff.	*SE*	*p*		Coeff.	*SE*	*p*
X (Advancement)	*a*	.28	.13	.036	*c′*	.31	.13	.018
M (Pride)		-	-	-	*b*	.13	.06	.045
Constant	i_1	-.06	.10	.528	i_2	-.19	.09	.049
		R^2 = .02				R^2 = .048		
		$F(227) = 4.44$, $p = .036$				$F(227) = 4.44$, $p = .036$		

Table 5-6. Simple mediation: Guilt on pro-environmental intention

		Consequent						
		Mediator (Guilt)				Y (Intention)		
Antecedent		Coeff.	*SE*	*p*		Coeff.	*SE*	*p*
X (Advancement)	*a*	-.27	.13	.045	*c′*	.36	.13	.006
M (Guilt)		-	-	-	*b*	.06	.06	.337
Constant	i_1	-.19	.10	.059	i_2	-.21	.10	.032
		R^2 = .02				R^2 = .034		
		$F(227) = 4.08$, $p = .045$				$F(226) = 4.02$, $p = .019$		

Table 5-7. Simple Mediation: Positive affect on pro-environmental intention

		Consequent						
		Mediator (Positive Affect)				Y (Intention)		
Antecedent		Coeff.	*SE*	*p*		Coeff.	*SE*	*p*
X (Advancement)	*a*	.35	.14	.012	*c′*	.25	.13	.047
M (Positive affect)		-	-	-	*b*	.27	.06	< .001
Constant	i_1	-.16	.10	.114	i_2	-.15	.09	.099
		R^2 = .03				R^2 = .11		
		$F(227) = 6.37$, $p = .012$				$F(227) = 14.03$, $p = <.001$		

Table 5-8. Simple Mediation: Negative affect on pro-environmental intention

		Consequent						
		Mediator (Negative Affect)				Y (Intention)		
Antecedent		Coeff.	*SE*	*p*		Coeff.	*SE*	*p*
X (Advancement)	*a*	-.27	.14	.051	*c′*	.35	.13	.007
M (Negative affect)		-	-	-	*b*	.03	.06	.608
Constant	i_1	-.17	.10	.102	i_2	-.20	.10	.037
		R^2 = .02				R^2 = .03		
		$F(227) = 3.84$, $p = .051$				$F(226) = 3.68$, $p = .026$		

5.6.Discussion

Following on from Studies 3 to 5 which looked into whether participants would balance conflicting goals and Study 1 which considered the influence of affect (guilt and pride), Study 6 focused on how goal construal may influence whether compensating or licensing is seen.

The design of Study 6 was based on research by Fishbach et al. (2006) and Fishbach et al. (2010) into how positive and negative feedback can motivate goal pursuit (see Section 5.3 for details). Fishbach et al. (2010) propose that positive feedback is only effective in motivating goal pursuit where it signals an increase in goal commitment, whereas, negative feedback is only effective where it signals a lack of progress. Fishbach et al. (2010) further propose that whether positive feedback is inferred to signal progress or commitment depends what goal is salient at the time feedback is received. The present study (Study 6), presented in this chapter closely followed the study design of Fishbach et al. (2006). Superordinate goals were manipulated by presenting participants with advertisements that either promoted environmental sustainability (conservation goals) or status (materialistic goals). Feedback on goal advancement was provided by asking participants to either list 3 or 12 pro-environmental actions undertaken in the last 6 months.

In light of the fact that listing 12 pro-environmental actions was a task which many participants were able to complete the decision was taken to divide the sample into three groups, namely: participants who succeeded in listing 12 actions (highly advanced), participants only asked to list 3 actions (advanced) and participants who failed to list 12 actions (not advanced).

The revised predictions were that:

1. Participants able to list 12 pro-environmental actions and for whom environmental goals were salient would infer positive goal advancement (high commitment) and show positive spillover, as would, participants asked to list 3 actions. In contrast, participants unable to list 12 actions were expected to infer negative goal advancement (low commitment) and show negative spillover.
2. Participants able to list 12 pro-environmental actions and for whom status goals were salient were predicted to infer positive goal advancement (high progress) and show negative spillover, as were, participants asked to list 3 actions. In

contrast, participants unable to list 12 actions were expected to infer negative goal advancement (low progress) and compensate.

Mediation analyses supported two hypotheses by Fishbach et al. (2006) and Fishbach et al. (2010). Where environmental goals were salient (i.e., as a result of the listing exercise)[27] and where participants inferred positive advancement towards environmental goals (by being able to list 12 actions), greater levels of pride and positive affect were reported which in turn mediated pro-environmental intention. In short, participants who experienced stronger feelings of pride and positive effect, having being able to list 12 pro-environmental actions, had stronger intentions to be pro-enviornmental. Where environmental goals were salient (i.e., as a result of the listing exercise) and where participants inferred positive advancement towards environmental goals (by being able to list 12 actions), lower levels of negative affect and guilt were reported. As predicted by Fishbach and colleagues where environmental goals were salient and positive affect was experienced, positive spillover effects were seen (i.e., higher pro-enviornmental intentions). Conversely, where pro-enviornmental goals were salient and negative affect was experienced, negative spillover effects can be seen. There was no significant relationship between participants who experienced more negative affect or guilt and stronger intentions to be pro-environmental in future. Perhaps, participants who were unable to list 12 actions felt discouraged from further pro-environmental action (Fishbach et al., 2006; Fishbach et al., 2010).

Conceivably, the fact that so many participants were able to list 12 pro-environmental actions could help to explain why the participants who listed only 3 actions (action advanced) did not differ significantly on any of the assessed measures compared with not advanced and highly advanced groups. It may have been the case, for example, that listing 3 actions was actually too easy a task and that these participants consequently did not feel that they had advanced substantially towards their goal. In contrast, participants who had succeeded in the more challenging task of listing 12 actions may have felt that they had advanced substantially towards being pro-environmental.

An unexpected finding from this research was an interaction which showed that participants in the status goal salient condition who had listed 12 pro-environmental

[27] It appears that the listing exercise made environmental goals salient for all participants. For further discussion of this limitation please refer to section 5.6.1.

behaviours had significantly higher positive affect than other participants. Positive affect was later found to mediate pro-environmental intention. Fishbach et al. (2006) would lead us to predict that these participants should have showed licensing effects and, therefore, expressed lower intentions to be pro-environmental. While there is no obvious explanation for this finding – one potential explanation could be that these participants actually reacted against materialistic consumer goals promoted by the advertisements. After first reflecting on advertisements which promoted materialistic goals, and then second reflecting on the high number of pro-environmental actions which they had undertaken, these participants may have seen their own goals and values as being in stark contrast to those promoted by the advertisements or indeed by society at large.

5.6.1. Limitations

The results of this study strongly suggest that the while goal advancement was successfully manipulated goal saliency was not. For example, the manipulation checks on the progress and commitment measures found no interaction between goal saliency and advancement. Instead, the manipulation checks showed that participants who succeeded in listing 12 actions felt greater commitment and progress. The data, therefore, provides evidence of positive spillover as opposed to compensation. Participants who were able to list 12 pro-environmental actions seemed encouraged to continue being pro-environmental.

One explanation for the failure to manipulate goal saliency is as follows: by asking all participants to list pro-environmental actions, the study made environmental sustainability salient in both experimental conditions (status and environmental). For example, the effects of describing advertisements showing status goods may have been neutralised as participants moved onto the listing task and focused on how their own actions had benefited the environment. Arguably, therefore, the manipulation of goal advancement could have overridden the goal saliency exercise, making environmental sustainability salient to all participants, including those, in the status condition. If this was the case then the experiment effectively had only one condition (environmental priming) with three levels (highly advanced, advanced and not advanced). It may be for this reason that the data are supportive of just one of hypotheses. In short, where pro-environmental goals are salient and participants infer that they are advancing in pursuit

of their pro-environmental goals positive spillover is seen (e.g., stronger pro-environmental intentions). The absence of evidence of compensation could arguably be attributed to ineffectiveness of the goal saliency manipulation, particularly as, compensation was only predicted to occur in the status goals salient action not advanced condition. It may be possible to address this limitation in future studies by switching the order of the tasks. For instance, participants could complete the listing exercise (advancement manipulation) first and then evaluate the advertisements (goal saliency manipulation).

A further potential limitation with the study was that the main dependent measure was participants' preference for eco-features when considering buying a new car. An ANOVA found no significant differences or interactions between groups with regard to car eco-features. One reason for this could be that many features which would reduce the negative environmental impacts of a car (e.g., break energy regeneration and stop start systems) would also feature on luxury status cars. It may also be the case that features such as break energy regeneration are not particularly associated with reducing negative environmental impacts. Similarly, although a conventional car may have eco-features these may be insufficient for it to be perceived as being a pro-environmental option. Better measures to assess preferences for more pro-environmental products could be used. For example, participants could be asked to choose between a luxury sports car and an electric vehicle or between organic cotton clothing and designer but non-organic clothing.

5.6.2. Concluding remarks

Unfortunately, due to limitations in study design it was not possible to test all the hypotheses set out at the start of Study 6, including, the hypothesis regarding when compensation would occur. However, the available findings from Study 6 are in line with Study 4 (see 4 4.2). In Study 4 it was found that people who imagined recycling subsequently expressed higher levels of positive affect (e.g., pride) and levels of motivation to be pro-environmental in future. Similarly, participants in Study 6 who reflected on their pro-environmental behaviours and who listed 12 actions were more motivated to be pro-environmental in future. The findings from all the studies presented in this thesis are explored in further detail in the Main Discussion (Chapter 6) which follows.

6. Chapter 6: Main discussion

6.1.Introduction

The thesis set out to investigate whether compensatory beliefs could explain why engaging in one pro-environmental behaviour decreases the likelihood of someone engaging in a subsequent pro-environmental behaviour (Truelove, Carrico, Weber, & Raimi, 2014). Compensatory beliefs have largely been studied in relation to health goals where they have been found to cause self-regulatory failures by allowing people to justify acting in a manner that is counter to their expressed goals and values. Specifically, evidence suggests that people resolve conflict between goals (e.g., to lose weight vs. to indulge in tasty foods) by reasoning that they can indulge now and compensate for any negative consequences at another time (Rabiau, Knäuper, & Miquelon, 2006). Unfortunately, in cases where people fail to follow through with the compensatory behaviour or where their beliefs are inaccurate, compensatory beliefs have been found to be a cause of slow or unsuccessful goal attainment (e.g., Kronick, Auerbach, Stich, & Knäuper, 2011).

The current research applied the concept of compensatory beliefs to environmental behaviours in order to investigate whether compensatory beliefs are used in relation to environmentally significant behaviours. This research also investigated whether or not the use of CGBs is related to attempts to overcome feelings of dissonance caused by acting (or intending to act) in environmentally detrimental ways. It was hypothesised that the endorsement of compensatory green beliefs may account (at least in some part) for the intention-behaviour gap, whereby, people's expressed pro-environmental goals and values do not map onto their behaviours (Kollmuss & Agyeman, 2002). This was investigated using hypothetical scenarios and pledged behaviours.

Chapter 1 identified a number of outstanding issues and questions that have been addressed by the empirical work presented in this thesis:

- Do people use compensatory beliefs to licence engaging in environmentally detrimental behaviours?
- What is the nature of the compensatory beliefs that people hold with respect to environmental behaviour?

- Do compensatory beliefs provide a useful framework for understanding why people face difficulties in achieving their pro-environmental goals?

Section 6.2 explains how the research presented in this thesis addressed the questions presented above. Finally, the chapter will conclude by outlining some potential limitations of this research and some avenues for future research in this area.

6.2. What did the thesis find concerning compensatory green beliefs? Answering the three questions

As evidence of compensation was found (see studies 1-3 in particular), this section will begin by exploring the nature of compensatory beliefs within an environmental domain. Section 6.2.1 will argue that compensatory beliefs should be seen within a broader framework of justifications for environmentally detrimental actions. Section 6.2.2 will then compare and contrast compensatory beliefs within health and environmental domains. It will be argued that compensation within an environmental domain is part of the same mechanism as moral licensing. The question of whether compensatory beliefs are a useful framework for understanding environmentally detrimental behaviours will be addressed within the wider discussion about the nature of compensatory beliefs.

6.2.1. Do people have CGBs, and, if so, what is their nature?

This section outlines how the research presented in this thesis addresses the first two questions. In looking for evidence for the presence and use of compensatory beliefs, this research found that compensation was just one of a variety of strategies people employed to justify environmentally detrimental actions to the self and to others. For example, participants in Study 1 reported employing a range of strategies to protect themselves against unpleasant thoughts or feelings of guilt and dissonance. For instance, participants appealed to low perceived behavioural control ("what can I do?"), made social comparisons (e.g., "they aren't doing anything so why should I?"), and/or appealed to perceived risks or higher loyalties (e.g., the impact of abstaining from air travel to business, family relations etc.) (Gifford, 2011).

In addition to these justifications Study 1 also provided insights into the evocation and use of CGBs. For example, Study 1 highlighted how people use compensation both to resolve guilt and to maintain their image of themselves as moral people. This finding,

points to the motivational roots of compensatory beliefs within the environmental domain (i.e., emotional and reputation management). Study 1 also points to the potential importance of morality in the promotion of pro-environmental behaviour as suggested by the Norm Activation and Value-Belief-Norm models of pro-environmental behaviour. Furthermore, Study 1 provided insights into how participants appealed to past or on-going pro-environmental behaviours arguing that, within their lifestyle as a whole, they struck a balance between minimising environmental harm and maximising personal benefits. This finding suggests that compensation within the environmental domain is done in a holistic rather than a piecemeal fashion. It is arguably the case that general and holistic compensatory beliefs better facilitate the exploitation of uncertainties concerning the relative costs and benefits of individual actions, thus, making it easier for people both to resolve their environmental guilt and to appear pro-environmental to others.

In an effort to identify and better understand the use of compensation within an environmental domain, this research also presented a range of experimental work which explored the relationship between affect and compensation. Study 1 had indicated that guilt was a potential trigger for compensatory-style justifications. This relationship between guilt and compensation was further investigated by Study 2. In Study 2 it was found that participants who thought about their negative environmental behaviours felt guilty. Again, participants generated compensatory-style justifications (see section 3.4.2). Participants in the guilt condition expressed stronger pro-environmental intentions than participants in the pride condition. However, further analyses showed that while guilt predicted pro-environmental intentions it did not predict willingness to volunteer (pledged behaviour). Taken together the findings of Studies 1 and 2, suggest that simply forming or endorsing a compensatory belief (or intention) can help to resolve guilt, potentially resulting in a gap between intention and behaviour (Kollmuss & Agyeman, 2002; Rabiau et al., 2006). This is particularly, likely to be of concern where guilt is resolved through retrospective compensatory beliefs (see Study 1). Study 4 found that people who imagined recycling reported significantly greater feelings of pride and intentions to act pro-environmentally. Furthermore, they acted pro-environmentally in response to the free-choice vignettes. Building on these findings Study 6 explored the relationship between perceived advancement towards goals, affect

and pro-environmental intention. It was found that positive affect and pride mediated intentions to be pro-environmental in future but that negative affect and guilt did not.

The question is raised as to whether it is positive and negative affect in general or pride and guilt in particular which are most important in influencing engagement with pro-environmental behaviour. The literature indicates that both positive and negative emotions can influence pro-environmental behaviour. For example, feeling happy or optimistic has been found to be an important predictor of green product purchases (Koenig-Lewis, Palmer, Dermody, & Urbye, 2014). Pride and guilt, however, have been identified as particularly important emotions in relation engaging in pro-environmental behaviour (Bamberg & Möser, 2007; Bissing-Olson, Fielding, & Iyer, 2016). This is because these emotions have been found to generally guide moral and pro-social behaviours. Pride and guilt can also be seen as 'self-conscious' emotions because these feelings are broadly based on individuals' own appraisals of their behaviour and standards of what is right or wrong (Bissing-Olson et al., 2016; Tangney & Mashek, 2007). These emotions are, therefore, arguably particularly likely to be associated with licensing, and compensating effects.

In light of the perceived importance of pride and guilt in relation to pro-environmental behaviour recent research by Bissing-Olson et al. (2016) focuses explicitly on these emotions. Bissing-Olson et al. (2016) used an experience sampling design to examine how pride and guilt relate to daily engagement in pro-environmental behaviours. Ninety-six students recorded: a) their engagement in specific pro-environmental behaviours and b) their feelings of pride and guilt in relation to these behaviours. This was done four times per day for three consecutive days. Importantly, Bissing-Olson et al. (2016) found that while pride about acting pro-environmentally was positively related to subsequent engagement in pro-environmental behaviour, guilt was not. (It should be noted that this effect of pride was only evident in people who perceived more positive pro-environmental descriptive norms.) These findings are broadly in line with those reported in this thesis. In short, it appears that pride in particular and positive affect more generally are important in motivating (and sustaining) pro-environmental behaviour (Bissing-Olson et al., 2016).

A further question is raised as to whether the manipulation of affect needs to be environment-specific (i.e., associated with the same context) or whether a separate manipulation of affect might have the same effect. For example, whether someone who

felt proud after raising money for the 'Help the Aged' charity (an altruistic act) would be more or less likely to then act pro-environmentally if given the opportunity. Work by Miller and Effron (2010) and Mazar and Zhong (2010) broadly suggests that behaviours that make one feel moral in general can have licensing effects and that these can be cross-domain (e.g., feeling licensed to lie or steal after buying an eco-product). Building on this, research by Meijers (2014) suggests that licensing effects within the environmental domain are moderated by environmental self-identity. Meijers (2014) found, for example, that participants with a weak green identity were less likely to report pro-environmental intentions after imaging purchasing eco-friendly shoes than after imagining purchasing conventional shoes. In contrast participants with strong green identities were unlikely to show these licensing effects. Research within this thesis (e.g., study 5) also indicates that strength of green identity is an important factor in determining the consistency of engagement with pro-environmental behaviours. Taken together, these findings indicate that licensing effects are unlikely within identity relevant contexts (Meijers, 2014). Arguably, therefore, a separate manipulation of affect (e.g., pride resulting from donating to a charity for the elderly) would probably result in a subsequent pro-environmental behaviour but only among participants with stronger green identities.

6.2.2. Methodological challenges and advances in measuring licensing and compensation

While there was evidence of compensating and licensing from both the qualitative and experimental studies, results were not entirely consistent and the studies had a number of limitations. Study 2, for example, only offered one opportunity for participants to compensate and the behaviour offered was potentially conceived of as being relatively difficult (time pledged to volunteering for a conservation charity). Study 3, therefore, attempted to address these limitations by offering participants multiple opportunities to compensate across a series of hypothetical scenarios. Study 3 also further investigated results from Study 1 which suggested that morality may be an important motivator for pro-environmental behaviour. The design of Study 3 was, therefore, based on the compensatory ethics model of Zhong, Ku, Lount, and Murnigham (2010) which indicated that people work to strike a balance between acting ethically and acting in self-interest. The findings of Study 3 supported this model – with participants "flip-flopping" (i.e., alternating) between more and less pro-environmental decisions (once

the extent of their green identity was controlled for). Study 3, therefore, found some evidence that participants were striking a balance between maximising personal gain and minimising environmental harm (i.e., licensing and compensating). The results of the remaining studies, however, did not replicate the compensating and licensing pattern seen in Study 3 but rather suggested that participants tended to act consistently. In should be noted, however, that to the extent that the manipulation of goal saliency in Study 6 was unsuccessful, it was difficult to test many of hypotheses made, including those regarding compensation.

Other attempts to replicate moral licensing effects have had similarly mixed results. For example, Blanken, van de Ven, Zeelenberg, and Meijers (2015) conducted three high powered experiments in an attempt to replicate the moral licensing effect found by Sachdeva, Iliev, and Medin (2009). For example, Blanken, van de Ven, Zeelenberg, and Meijers (2015) conducted three high powered experiments in an attempt to replicate the moral licensing effect found by Sachdeva, Iliev, and Medin (2009). The original study by Sachdeva et al. (2009) found that participants who wrote about their positive personal traits donated significantly less to charity and were less cooperative than participants who had reflected on their negative traits. However, the first two replication attempts conducted by Blanken, et al. (2015) did not confirm the original results and the third found some evidence of moral cleansing but not of licensing.

The "moral cleansing effect" (Zhong & Liljenquist, 2006) describes cases where a positive behaviour becomes more likely after recalling a past negative behaviour. Moral cleansing can, therefore, be seen as the opposite pattern to licensing (where after recalling a prior positive behaviour a person is more likely to act negatively). Arguably, compensation within an environmental domain can be seen as a form of moral cleansing, whereby, having recalled an environmentally detrimental behaviour someone feels morally deficient and is, therefore, motivated to perform a pro-environmental behaviour. The results of the replication studies by Sachdeva et al. (2009) suggest that in order to replicate moral licensing and compensating (or cleansing) effects high powered experiments are required.

In support of this claim that high powered experiments are required, a meta-analysis conducted by Blanken, van de Ven, and Zeelenberg (2015) of 91 studies comparing a licensing condition with a control condition found that the magnitude of the licensing effect was small (Cohen's *d* of 0.31). This means that studies may require large samples

in order to draw reliable conclusions about licensing effects on moral behaviours. The meta-analysis further indicated that published studies tended to report larger effects of moral licensing than unpublished studies. In short, it appears that the lack of evidence of compensating and licensing effects in Studies 4 to 6 may be representative of findings more generally within this field.

Very few studies have considered how moral choices evolve over a series of scenarios (Barque-Duran, Pothos, Yearsley, & Hampton, 2015; Zhong et al., 2010). Recent research by Barque-Duran et al. (2015) is, therefore, highly relevant to this thesis. These authors investigated moral choices across a series of scenarios to explore whether "balancing vs. consistency" would be maintained over time (as measured by what the authors termed a "zig-zag" pattern). Because recent research on moral dynamics suggests that outcome-based mind-sets (termed a "consequentialist" worldview) versus rule-based mind-sets (termed a "deontological" worldview) moderate the impact of an initial (un)ethical decision on the likelihood of subsequently behaving ethically, Barque-Duran et al. (2015) investigated the extent to which these mind sets are maintained over time.

Barque-Duran et al. (2015) report two main findings: 1) that moral balancing was not maintained over time and 2) that moral consistency could be maintained, but only if the mind-set was re-enforced by repeating the manipulation at each stage of the experiment. In short, the authors found that if the manipulation of mind set and recall was only included at the start of the experiment there was a quick regression to neutral performance (i.e., data trended to the middle of the 7-point scale) meaning that the "zig-zag" pattern was only observed at the first stage of the experiments. Some, albeit, unsustained evidence of balancing effects was, therefore, observed.

Barque-Duran et al. (2015) suggest that using a 7-point scale may have been problematic in looking for a "zig-zag" pattern. This is because using a scale rather than a binary response (e.g., ethical vs unethical response) provided participants with an opportunity to establish a balance between moral and selfish motives by selecting options from the middle of the scale. Furthermore, selecting the midpoint of the scale would, arguably, be an easier way for participants to compensate than seeking to balance out more extreme moral responses. While, Barque-Duran et al. (2015) interpret participants' tendency to opt for the middle response options as indicating a preference for achieving a "middle ground", an alternative explanation of their findings might be

that participants opted to take a compensatory approach to decision-making. Similarly, Zhong et al. (2010) also used a scale to measure the ethicality of participants' choices. This resulted in the concern that the post-hoc results of Zhong and colleagues' first study could have been a function of regression to the mean. This would lead to initial extreme deviations gravitating to an overall mean in subsequent choices. Zhong et al. (2010) opted to manipulate participants' first choice in Study 2 to guard against regression to the mean. In contrast, as Studies 3 to 5 in this thesis used a binary measure regression to the mean was not considered as an issue.

The findings by Barque-Duran et al. (2015) are interesting because, while only Study 3 in this thesis succeeded in identifying "flip-flopping" patterns, these patterns were maintained overtime. Studies 4 and 5 found a positive relationship between responses over time, suggesting that participants made morally consistent choices across the scenarios. The novel approach used in Studies 3 to 5 of looking at sequential decision-making and also using a binary variable, therefore, make a contribution both to the methodology used to look for licensing effects and also to the current debate on moral balancing. In short, using a binary variable deprives participants of opting for some kind of middle ground and forces them to make a choice that is clearly more or less ethical. However, the fact that findings still did not consistently support the notion that preceding actions license, or are compensated for by, subsequent action means that there is only equivocal evidence for compensation and licensing in this environmental domain.

It should be noted that studies on sequential decision-making have tended to focus on relatively short periods of time. This could problematic if moral balancing effects tend to occur over longer time frames than are generally studied in experimental research (Barque-Duran et al., 2015). One recent exception to this is research by Hofman, Wisneski, Brandt, and Skitka (2014). These researchers conducted a study where 1252 adults in the United States and Canada were randomly signalled five times per day on their smartphones for three days and asked to indicate whether they had committed, were the target of or had learned about an (im)moral event. Licensing effects were found. Committing a moral act earlier in the day was associated with a greater likelihood of subsequently acting immorally and a decreased likelihood of subsequently undertaking a moral act. Research from this thesis also suggests that it may be more productive to look for compensating and licensing effects over longer time periods.

Participants in Study 1, for instance, took a relatively long term view arguing that their previous and on-going (habitual) pro-environmental actions would cumulatively balance out those aspects of their lives that were less pro-environmental.

A potential reason why compensation and licensing effects were found in Study 3 but not in Studies 4 and 5 relates to perceived social pressures and to participants' self-identities. In Study 3, for example, participants came in person to undertake a pro-environmental study where an experimenter was present. Participants' perceptions of the expectations of the experimenter (e.g., that they *should* act pro-environmentally) coupled with the fact that younger people tend to be less consistently ethical (see Sidani, Zbib, Rawwas, & Moussawer, 2009) could have resulted in these participants flip-flopping between more and less pro-environmental behaviours – an effect that was not seen in the subsequent studies that were run online (Studies 4 and 5). Participants in Study 3, for example, had a mean age of 19.19 (SD = 1.35) and were, therefore, younger than participants in Study 4 (M = 23.94, SD = 6.63) and Study 5 (M = 38.38, SD = 11.92). Further work needs to be undertaken to explore these potential explanations.

To summarise, there is evidence that people do employ compensations to justify (to themselves or to others) environmentally detrimental actions. Evidence of compensation was found using qualitative (Study 1) and also experimental methods (Studies 1 to 3 in particular). The results of Studies 4 and 5, however, are more difficult to interpret and tend to suggest an overall preference for consistency rather than licensing and compensating. There are a variety of potential reasons (e.g., social factors) why Studies 4 and 5 did not replicate the "flip-flopping" pattern observed in Study 3 which could be explored in future research.

6.2.3. Do compensatory beliefs provide a useful framework for understanding why people face difficulties in achieving their pro-environmental goals?

In the health domain, compensatory beliefs have been argued to provide a useful framework for understanding why people face difficulties in achieving their goals. This research posed the question of whether the same is true in the environmental domain. This section will outline the similarities and differences between compensation in the two domains.

The research presented in this thesis suggests that there are some important factors in common between compensation in the two domains. First, in line with the health

literature the present research found that dissonance (e.g., guilt) prompted compensatory justifications and intentions (e.g., Study 2) (Rabiau et al., 2006) but that these did not necessarily translate into compensatory actions (e.g., guilt did not predict pledged behaviour in Study 2) (Taylor, Webb, & Sheeran, 2014). Furthermore, as expected, participants with "middling" (i.e., moderately strong) green identities showed more inconsistent behaviour ("flip-flopping") than participants with relatively weak or strong green identities (Study 5) (Rabiau et al., 2006). Thus, the extent to which people identified with the goal of being pro-environmental influenced their environmental decision-making (see also Studies 4 and 5) with participants who more strongly identified with environmental goals being more consistently pro-environmental in their decision-making (Meijers, 2014; Rabiau et al., 2006). In short, it seems that participants generally had a preference for acting consistently with the exception of the "middling" greens who were conflicted (i.e., torn between acting pro-environmentally and in self-interest) (Bem, 1967; Festinger, 1957).

Furthermore, just as inaccurate compensatory health beliefs or a failure to undertake the planned compensatory action increases risk to the individual of failing to achieve their health goal – inaccurate compensatory green beliefs are likely to limit individuals' progress in being more sustainable (Kaklamanou, Jones, Webb, & Walker, 2015; Rabiau et al., 2006). For example, Study 1 and 2 (participants' comments) suggest that people believed that relatively low cost and low (positive) impact behaviours (e.g., recycling) could compensate for higher (negative) impact but nonetheless desirable behaviours (e.g., car use, air travel or meat consumption) (Bin & Dowlatabadi, 2005). Additionally, as predicted by Rabiau et al. (2006), Study 1 found evidence that participants were reluctant to closely scrutinise the validity of their compensatory beliefs. These findings, therefore, suggest that compensatory beliefs are maladaptive to the extent that they may be inaccurate and facilitate the licensing of negative environmental impacts which are not fully off-set and which inhibit the rate of behavioural change (Kaklamanou et al., 2015).

There are, however, also some potentially important differences in the nature of compensation in health and environmental domains. Health behaviours, for example, have costs and benefits that are directly experienced by the individual (e.g., weight loss). In contrast, while there is a direct cost to acting pro-environmentally there is usually no direct benefit to the individual. In fact, the benefit is likely to be both

spatially and temporally removed. For this reason, pro-environmental behaviours can also be seen as pro-social or moral behaviours (Nisbet & Gick, 2008). Arguably, therefore, the efforts made by individuals to strike a balance between maximising pleasure while minimising environmental harm can be seen as akin to moral licensing and cleansing effects (Rabiau et al., 2006; Zhong & Liljenquist, 2006). For example, the belief that compensation is possible could license environmentally detrimental action(s). Participants in Study 1, for example, argued that their habitual pro-environmental behaviours would compensate for their environmentally detrimental behaviours. In short, such compensatory beliefs legitimise environmental harm. Furthermore, to the extent that individuals experience guilt about their environmental impacts they may be motivated to undertake compensatory ("cleansing" or "off-setting") behaviours (e.g., Studies 2-5) in an attempt to balance out the negative impacts of their behaviour.

Another potential difference between compensation in health and environmental domains (which again may make environmental compensation more akin to moral licensing) was the role of compensatory justifications in maintaining green credentials. In short, compensatory justifications were found to be used as a form of reputational "damage control" (Joosten, van Dijke, van Hiel, & De Cremer, 2013). By drawing attention to their environmental credentials, participants in Study 1 felt that they could continue to appear green even while continuing to undertake environmentally detrimental actions. Furthermore, when participants in Study 2 were asked to list their behaviours that harmed the environment they went beyond the experimental protocol and also listed examples of pro-environmental behaviours. These examples appear to have been provided by participants in an attempt to defend their green credentials and allow their harmful behaviours to be construed in a broader context (Miller & Effron, 2010).

To summarise, just as compensatory beliefs have been found to inhibit or slow the adoption of healthier behaviours, they can also be seen as a threat to the adoption of more pro-social and pro-environmental behaviours. In answer to the question posed in Chapter 1, the framework of compensatory beliefs can, therefore, provide a useful lens by which to better understand the way in which people reason about their less pro-environmental behaviours.

6.3.Limitations and future directions

The studies reported in this thesis have a number of potential limitations, one of which is that measures of real or actual behaviour were not used. For example, Study 2 used pledged behaviour (volunteering), Studies 3 to 5 used hypothetical scenarios and Study 6 used preferences (hypothetical car purchase). To the extent that hypothetical decisions do not have real behavioural costs (e.g., time, difficulty) it might be expected that the intention-behaviour gap would be smaller with hypothetical behaviours than with actual behaviours. That is, in cases where there is no real difficulty in acting, we would expect people to be more likely to act (or make decisions) in accordance with their intentions. Experiments with actual behavioural measures may have been more likely, therefore, to detect licensing and compensating effects. Nonetheless, Study 3 did succeed in identifying patterns suggestive of compensating and licensing effects and participants' willingness to volunteer in Study 2 was still low even though it was just a pledged behaviour. Furthermore, there is some assurance from the fact that the meta-analysis conducted by Blanken et al. (2015) showed no significant differences between actual and hypothetical behaviours in licensing.

Nonetheless, potential differences between responses to hypothetical scenarios and more realistic situations would be worth investigation in future studies. For example, a more naturalistic sequential decision-making task could include asking participants to engage in an online shopping task. Participants could be asked to choose between either buying more expensive but environmentally friendly goods or buying lower cost and less environmentally friendly goods. It would be expected that participants who felt "in credit" in terms of past pro-environmental behaviours would feel licensed to select the cheaper but more environmentally detrimental goods, while those participants who felt "in deficit" would show a preference for the more expensive but environmentally benign goods.

Another potential limitation in Studies 3 to 5 is that the dependent variables were binary (i.e. participants had to choose between two options). Again, this could be seen as somewhat crude and unrealistic. However, having binary variables was helpful in setting up a dilemma (e.g., between indulgence and restraint); the idea being that participants would be forced either to make a personally costly but environmentally beneficial decision or a personally beneficial but environmentally costly decision. It was

not possible to do both. It was anticipated that participants would try and strike a balance between maximising pleasure and minimising harm by "flip-flopping" between more and less pro-environmental decisions across the scenarios. While including a Likert scale might have provided a more sensitive measure there were good reasons for using a binary variable (see detailed discussion in section 6.2.2).

A number of studies reported in the present thesis found evidence that participants acted consistently, rather than using positive actions to compensate for and/or license more negative actions. For example, participants in Study 6 who succeeded in listing 12 pro-environmental actions reported higher levels of general positive affect and also pride than participants who had failed to list 12 actions. Furthermore, it was found that general positive affect and also pride were mediators between perceived progress in being pro-environmental and intentions to be pro-environmental in future. In short, participants who listed 12 pro-environmental actions participants felt positive and this in turn motivated them to be pro-environmental in future (positive spillover). Similarly, participants who imagined recycling in Study 5 appeared to be more motivated to engage in future environmental behaviours.

The findings of Studies 5 and 6 suggest moral re-enforcement effects such as found by Young, Chakroff, and Tom (2012). Young and colleagues found that participants who were asked to reflect on good deeds subsequently donated significantly more to charity than participants who had recalled bad deeds. Interestingly, this effect was even stronger among participants who were not asked to recall whether their deed had been observed by someone else. Young et al. (2012) propose that when people are primed to see themselves as good for goodness' sake (e.g., rather than to gain public credit) they may be motivated to undertake further good deeds. Insofar as pro-environmental behaviours can also be seen as moral, altruistic or pro-social, similar effects may have occurred as a result of asking participants to reflect on pro-environmental actions.

Future research could further investigate ways to re-enforce moral or in this case, specifically, pro-environmental behaviours. For example, participants could be asked to read a short text about the importance of pro-environmental action and then complete some sentences such as: "Virtuous people take time to benefit the environment by …" "Someone who recycles could be seen as moral because …" In contrast participants in a control condition could be asked to read a short piece of neutral text (e.g., instructions about assembling shelves). These participants could then complete sentences about the

tools required for the task (e.g., "the most appropriate tool with which to drive in the nails would be a …"). Following this, participants could be given the opportunity to a) indicate their intentions to benefit the environment in future and b) donate some money to a pro-environmental organisation of their choosing. At the end of the experiment, participants could be offered a small sum to thank them for giving up their time to participate in the research. The participant would be invited to leave some money in an envelope (along with instructions as to which charity they would like to donate to) on the desk on their way out. It could be hypothesised that participants who reflected on the morality of being pro-environmental would be motivated to express stronger pro-environmental intentions and also donate more to charity.

A related way of encouraging more consistent engagement in pro-environmental behaviours would be through what have been termed "social labelling techniques" (Meijers, Noordewier, & Avramova, 2014). Social labelling is a way of encouraging individuals to take a certain self-view in an effort to influence their subsequent action(s) (Allen, 1982; Bem, 1967). For example, providing someone with the social label: "You are a pro-environmental person", may lead them to see themselves as "pro-environmental" and behave accordingly. There is, in fact, already some evidence that social labelling may be effective in promoting a green identity. Cornelissen, Dewitte, Warlop, and Yzerbyt (2007) prompted participants to make a pro-environmental decision (e.g., to choose a more environmentally-friendly television). Participants were then provided with information that enabled them to construe their behaviour as attributable to their personal values. Subsequently these participants more likely to choose other sustainable products.

Green identity also emerged as a significant predictor of pro-environmental decision-making in the studies reported in this thesis. For instance, Study 3 only found the "flip-flopping" patterns in participants' responses when green identity was controlled for. Furthermore, when green identity was added to the regression models in Study 4 and Study 5, behavioural history was no longer a significant predictor of current decisions. It would be interesting to repeat the sequential decision-making tasks both with and without social labelling techniques and to compare the level of flip-flopping seen. It would be hypothesised that participants in the social labelling condition would act more consistently (i.e., flip-flop less).

The findings of this thesis research suggest that strategies which provoke feelings of environmental guilt are likely to elicit undesirable responses including compensatory justifications (e.g., Studies 1 and 2) and to lower motivation to engage in pro-environmental actions (e.g., Study 4). In contrast, this research suggests that strategies which lead participants to reflect on their contributions to helping the environment and which make them feel positive also seem to increase motivations to do more to be pro-environmental. Study 6, for example, showed that the effects of perceived environmental goal advancement on intentions to be pro-environmental in future were mediated by positive affect but not by negative effect. This finding that negative effect (e.g., guilt) appeared to discourage engagement in being pro-environmental was to some extent, unexpected because the literature suggests that feelings of guilt should motivate reparative acts (e.g., Bamberg & Möser, 2007). However, it is exactly when people experience uncomfortable feelings of guilt that we should expect them to employ cognitive strategies such as compensatory beliefs (Rabiau et al., 2006).

Future research could fruitfully investigate the most effective strategies for making people feel positive about their environmental behaviours without enabling them to feel licensed to relax in their pursuit of environmental goals. Strategies could include the moral re-enforcement and social labelling techniques (as discussed above) and also reflective (e.g., such as used in Study 1) or imaginative exercises (e.g., Study 4). For example, Study 4 found that simply imagining recycling increased participants' levels of positive affect and intention to be more pro-environmental in future. In light of this future research could adapt techniques used in imagined contact studies (see Medeady, Crisp, & Hopthrow, 2013) or employ strategies such as perspective taking (e.g., imagining personally experiencing the negative consequences of climate change) (Pahl & Bauer, 2013).

6.4. Conclusions

This research set out to investigate whether people do use compensatory beliefs to license engaging in environmentally detrimental behaviours and, if so, to discover more about the nature and extent of compensatory beliefs within an environmental domain. One main finding of this research was that participants did hold compensatory beliefs (Study 1). Another main finding of this research was that compensatory green beliefs were general, cumulative and based on habitual behaviours, making them differ

somewhat in nature from the measure of green compensation by Kaklamanou et al. (2015). This research further highlighted a number of similarities and differences between compensation within the health and environmental domains. As with health compensation, compensatory green beliefs were associated with managing unwelcome feelings of dissonance such as guilt. Interestingly participants also emphasised the role of compensation in reputation management (i.e., appearing pro-environmental to others).

Most importantly, this research made several findings concerning the effects of compensatory green beliefs on decision-making. The experimental studies conducted for this thesis research build on the compensatory belief model (Rabiau et al. 2006), finding evidence that individuals who are conflicted do attempt to balance competing demands (in this case between self-interest and environmental concern). The experimental work also found evidence in support of the compensatory ethics model (Zhong et al. 2010) as participants in Study 3 "flip-flopped" between more personally beneficial but environmentally detrimental and personally detrimental but environmentally beneficial choices across a series of scenarios (although in Studies 4-5, green identity appeared to be more important in decision-making than previous choice).

The findings of this research allow for a number of concrete suggestions concerning the direction of future research in this area. Taking into account the findings a number of suggestions for improving the measurement of compensation and licensing can be made. It seems fair to suggest that:

1. because effect sizes are small, high powered experiments are required to fully understand the nature and extent of compensating and licensing effects;
2. that participants should be allowed to respond freely to moral dilemmas as opposed to having their responses forced (see Chapter 4);
3. that using dichotomous response options to explore moral balancing effects is a promising avenue for future research and;
4. that looking at sequential decision-making over longer periods of time may be a more effective strategy in detecting "balancing" effects.

Finally, the findings of this research suggest some important lessons for those interested in promoting pro-environmental behaviour. Overall, the results from this thesis suggest that compensatory beliefs can be seen to constitute yet another strategy to reduce

feelings of environmental guilt – resolving dissonance by denying that any conflict exists. The belief that previous or planned pro-environmental behaviours can compensate was found to license environmentally detrimental behaviours. Somewhat ironically, it appears that such strategies are used *because* people care about the environment and feel distress that they are contributing to environmental problems. Therefore, these findings suggest that engagement in pro-environmental behaviour can be promoted by reflecting on or imagining the positive feelings associated with undertaking pro-environmental behaviours. Moreover, these findings cast doubt on the efficacy of strategies which provoke negative affect (e.g., guilt) and elicit defensive responses such as compensatory beliefs and justifications rather than behaviour change.

To conclude, this research, found evidence of compensatory green beliefs and provided insights both into how people think and feel about their environmentally detrimental actions. Finally, this thesis provided insights into the kinds of strategies which may be effectively employed to promote more sustained engagement in pro-environmental action.

Appendix One: Compensatory Green Belief Scale

Participants were asked to rate how closely each statement reflected their own personal beliefs using a 5-Point Likert scale anchored by “strongly disagree” and “strongly agree”. Below are the scale instructions and items presented to participants:

“Below are a series of beliefs that people may hold about energy, water, transport and the environment. Please read each sentence carefully (out loud) and rate how closely the statement reflects YOUR own beliefs by marking the appropriate box. Since we all believe different things, there are no right or wrong answers.”

1. Not using a dishwasher can compensate for taking longer showers.
2. Walking to the supermarket can compensate for buying highly packaged food.
3. Having a water butt can compensate for using the oven.
4. Limiting your household water consumption can compensate for not better insulating your home.
5. Not driving a car compensates for flying on holiday.
6. You do not need to worry about which country your food comes from if you use energy efficient appliances in the home.
7. It is okay to leave the lights on if you use low energy light bulbs.
8. It is okay to have lots of electrical items if you turn them off when not in use.
9. If you mostly eat in-season produce, then it is okay to sometimes eat out-of-season produce.
10. It is okay to drink bottled water if you limit the number of car journeys that you make.
11. Flying abroad can be made up for by being a vegetarian (i.e. not eating meat).
12. Not driving a car compensates for not recycling.
13. If you have a low flush toilet then it is okay to use more water in other ways.
14. If the majority of food that you buy is produced locally, then it is okay if the rest is imported.

15. Using public transport on some occasions can compensate for using the car on other occasions.
16. Composting food waste can make up for buying imported food.
17. Recycling compensates for driving a car.
18. If you have energy efficient electrical equipment, then it is okay to leave it on standby.
19. It is okay to leave goods turned on if they are modern and efficient.
20. It does not matter how much energy you use if you are on a green energy tariff.

Appendix Two: Materials for Study 2

Survey materials and study debrief

Green Identity (with distractor items): The 4 item measure of green identity (Whitmarsh & O'Neill, 2010) with distractor items is provided below. Responses were recorded using a 5-point Likert Scale with neither agree nor disagree as the midpoint. The items from Whitmarsh and O'Neill (2010) are indicated by an asterisk.

Do you agree or disagree that:

- I would be embarrassed to be seen as having a healthy lifestyle
- I think of myself as someone who is very concerned with environmental issues*
- I want my family and friends to think of me as someone who has a healthy lifestyle
- I think of myself as an environmentally friendly consumer*
- I want my family and friends to think of me as someone who is concerned about environmental issues* [28]
- I think of myself as someone who is very concerned with health issues
- I would be embarrassed to be seen as having an environmentally friendly lifestyle*
- I think of myself as someone who eats healthily

Measure of intention to "do more to help the environment". Responses were recorded on a 7-point Likert scale anchored by *very untrue of me* and *very true of me*. The midpoint was labelled as "neutral". A number of distractor items were included which related to health and helping others.

- I intend to eat more healthily
- I intend to drink more water
- I intend to do more to help the environment
- I intend to take more exercise
- I intend to do more to help other people

[28] The negative wording ("I would not want") of the original item was removed because it was thought that it could potentially be confusing for participants.

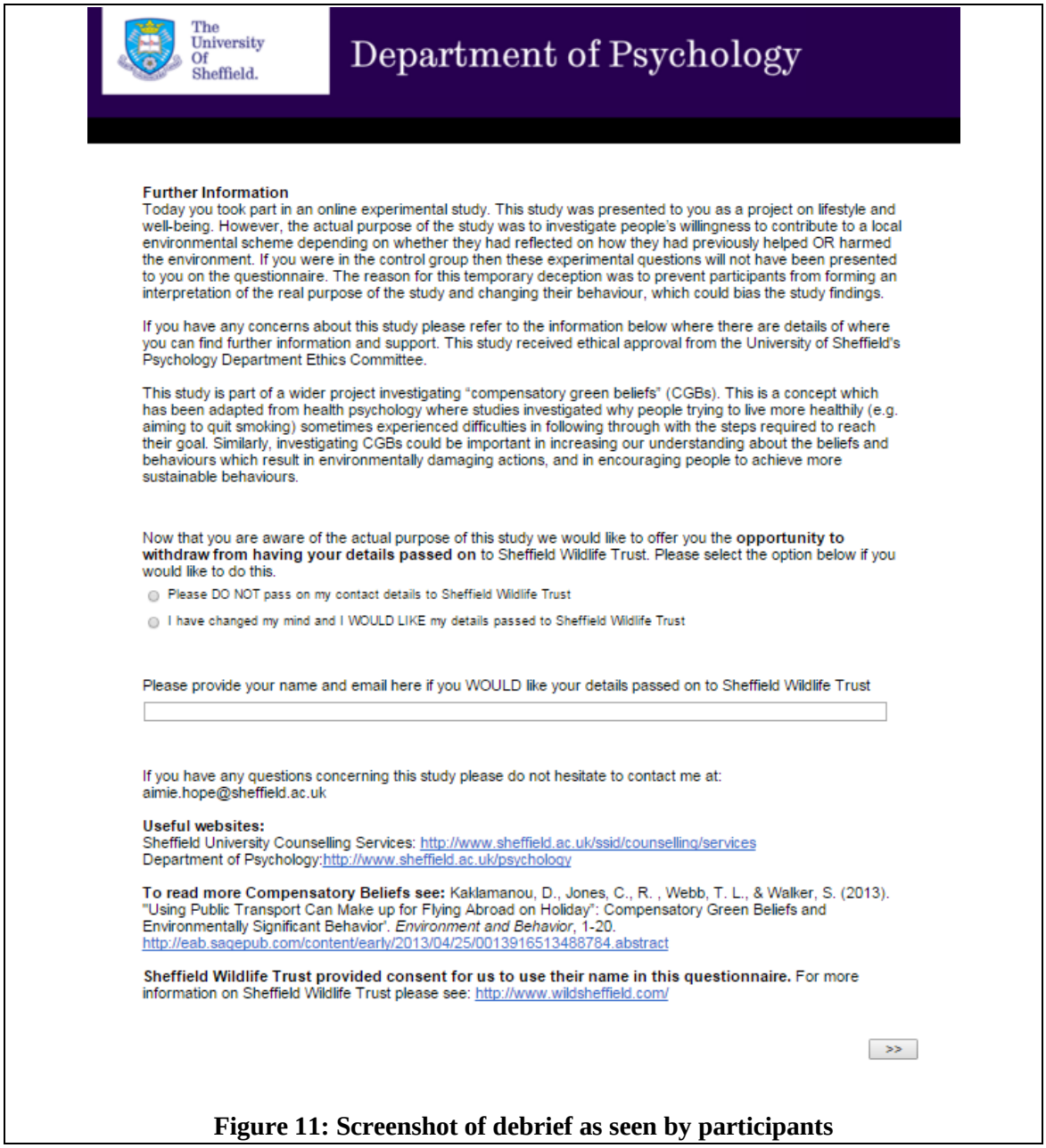

Figure 11: Screenshot of debrief as seen by participants

Analyses of participants following the experimental protocol

In Section 3.4.2 it was stated that a total of 47.01% of participants did not strictly adhere to the experimental protocol. For this reason the analyses were repeated with all (i.e., 25) participants in the guilt condition who had followed the protocol and a random sample of 25 participants from the pride condition who had also adhered to the protocol. As the only significant differences found were between the experimental conditions the control condition was not included in these additional analyses. The results support those reported in the main results section. An independent-samples t-test was conducted to compare guilt scores for the pride and guilt conditions. There was no significant difference in scores for the guilt condition (n = 23, M = 1.57, SD = .73) and the pride condition (n = 24, M = 1.21, SD = .59; $t(45) = 1.84$, p = .072, two tailed) (equal variances not assumed). Furthermore, an independent-samples t-test to compare pride scores for the pride and guilt conditions found no significant differences in scores for the guilt condition (n = 23, M = 2.57, SD = 1.20) and the pride condition (n = 24, M = 2.17, SD = 1.09; $t(45) = 1.19$, p = .239, two tailed). An independent-samples t-test comparing levels of intention to be more pro-environmental in future supported earlier findings in that there was a significant difference in scores for the guilt condition (n = 22, M = 5.00, SD = 1.07) and the pride condition (n = 24, M = 4.21, SD = 1.07; $t(44) = 2.34$), p = .024, two tailed). Finally, an Independent t-test found no significant differences in terms of hours donated between the guilt condition (n = 5, M = 8.20, SD = 7.33) and the pride condition (n = 2, M = 10.00, SD = 14.14; $t(5) = .236$, p = .823, two tailed).

Appendix Three: Materials for Studies 3-5

Vignette evaluation form

Story: Bags

> Although you have purchased a number of reusable 'bags for life' you realise when you get to the checkout that you have left them in your car which is just outside the store. There is a queue of people behind you waiting to be served. It is your weekly shop meaning that you will need to take quite a lot of disposable plastic bags unless you go to the car to get your reusable bags.

Which of the following would you do? (Please circle an option)

- Option 1: Go to the car to get the reusable bags.
- Option 2: Use the disposable plastic bags at the checkout.

1. How easy was it to understand the story? (Coded 4 = very easy and 1 = very difficult)

Very easy	Somewhat easy	Somewhat difficult	Very difficult

If it was not very easy please briefly explain why.

……

……

……

2. How easy was it to understand the response options? (Coded 4 = very easy and 1 = very difficult)

Very easy	Somewhat easy	Somewhat difficult	Very difficult

Any comments?

3. How believable was the story? (Coded 4 = very believable and 1 = very unbelievable)

Very believable	Somewhat believable	Somewhat un-believable	Very unbelievable

Please briefly explain your response. (Open response)

……
……
……

4. How believable were the response options? (Coded 4 = believable and 1 = very unbelievable)

Believable	Somewhat believable	Somewhat un-believable	Very unbelievable

Please briefly explain your response. (Open response)

……
……
……

5. How pro-environmental were the response options? (Coded 1 = un-environmental and 4 = pro-environmental.)

	Un-environmental	Somewhat un-environmental	Somewhat pro-environmental	Very pro-environmental	Don't know
First option					
Second option					

6. Please evaluate each response option in terms of how personally costly you think it would be (e.g. in terms of inconvenience caused, monetary cost, time taken). (Coded 1 = not costly and 4 = very costly)

	Not costly	Somewhat costly	Quite a bit	Very costly

First option				
Second option				

7. Can you think of a way to improve this story and/or its response options? (Open response)

……

……

……

Study 3: Ten vignettes exploring sequential pro-environmental decision-making

As you read each of the stories, please take a little time to imagine yourself in the situation described. Even if you have never experienced the situation before, try to imagine yourself in it.

After reading each story you will need to make a decision. Remember, that you have the opportunity to do EITHER of the options which are presented.

Please answer as honestly as possible. There are no right or wrong answers.

a) You are studying Environmental Conservation at a university in the UK. You have been given the opportunity to attend a training course assessing the environmental impact of different activities. The course is in France and you know that it's a great opportunity to develop your professional skills. You have a limited budget and after some research you find that it is more expensive to travel by train than by plane. However, flying will result in significantly more carbon emissions than rail travel. You are aware that flying will cause greater damage to the environment; but flying will save on travel costs and enable you to afford nicer food and accommodation while you are away.

Which of the following would you do?

- Travel by train.
- Travel by plane.

b) Your New Year's resolution was to get fit. As a result, you have just been for a long walk in the countryside. However, it rained hard for the last two hours and

you are now feeling cold and wet. You think it would be nice to have a long hot shower. However, you know that having a long shower will cause more damage to the environment than having a short shower because it will use more water.

Which of the following would you do?

- Have a long shower.
- Have a short shower.

c) You find your job stressful and enjoy shopping for leisure at the weekends. You particularly enjoy treating yourself to new clothes. However, you have recently been made aware that the clothing industry is not very sustainable and, thus, that by shopping for leisure you are contributing to the sustainability problem. Cotton, for example, is one of the most pesticide intensive crops in the world and many discarded clothing items end up in landfill.

Which of the following would you do?

- Buy from second hand clothes shops (e.g. vintage shops).
- Continue to shop as usual.

d) In your garage you find a number of unused tins of emulsion (paint) that were left over from when you recently decorated your house. You no longer want the emulsion and it is taking up valuable storage space. You notice that the tins have a label stating that you need to allow the emulsion to set solid before it is disposed of with the general waste. This can be done quite easily by adding some sand which is something that you happen to already own.

Which of the following would you do?

- Take time to locate and travel to a community paint recycling program.
- Throw the unused paint away once it has solidified.

e) You realise that the gas central heating has been left on at a high temperature all weekend while the house has been empty. Not only has this cost you money but it has also wasted a lot of gas. You will easily be able to afford the bill but you still feel annoyed because you know that heating uses more energy in the home than any other activity.

Which of the following would you do?

- Invest time in reading through the complex boiler manual in order to re-set the temperature and timing settings.
- Continue as usual.

f) You have had family members come to visit. As a result you have more waste to dispose of than usual. You have been storing the materials that can be recycled (e.g., cardboard, tins, plastic bottles, and glass) but these are taking up valuable space in your kitchen. Your recycling bin is full and you cannot fit in the remaining bags of plastic, glass and paper. There is, however, some space in the general disposal bin but this will mean that the recyclable materials will be sent to landfill.

Which of the following would you do?

- Store the recycling until the next recycling collection.
- Put the recycling in the general disposal bin.

g) You have invested in energy saving light bulbs for your house and have replaced all of the old-style light bulbs with the new more efficient ones. However, the person you live with keeps forgetting to turn lights off at night. In your opinion it is wasteful to leave the lights on unnecessarily but continuing to challenge this person's behaviour could cause tension and there are probably more important issues to worry about.

Which of the following would you do?

- Insist that lights are turned off at night.
- Ignore this problem for now.

h) You buy fresh fruit each week but most of it gets thrown away because it is not eaten soon enough. You are aware that this not only wastes money but also damages the environment. Your friend suggests that you cook the damaged or overripe fruits or use them to make smoothies. However, as someone who works long hours you wonder whether you will have the time.

Which of the following would you do?

- Use the damaged/overripe fruit in other ways.
- Continue to dispose of the fruit as usual.

i) You have a young family and two of your children still wear nappies. You have made the decision to purchase disposable nappies rather than reusable ones because it's one less thing to worry about. You think that using disposable nappies will save you time on laundry and give you more time in which to relax and be with your family. However, you notice that you have to dispose of a lot of nappies each day. As a result you do a quick search on the internet and discover that each baby uses more than 4,000 nappies before they are potty trained and that each nappy will take over 200 years to naturally degrade.

Which of the following would you do?

- Start using reusable nappies.
- Continue using disposable nappies.

j) Although you have purchased a number of reusable 'bags for life' you realise when you get to the checkout that you have left them in your car which is just outside the store. There is a queue of people behind you waiting to be served. It is your weekly shop meaning that you will need to take quite a lot of disposable plastic bags unless you go to the car to get your reusable bags.

Which of the following would you do?

- Go to the car to get the reusable bags.
- Use the disposable plastic bags at the checkout.

Study 4: Vignettes (imagined recycling scenarios)

As you read each of the following stories, please take a little time to imagine yourself in the situation described. Even if you have never experienced the situation before, try to imagine yourself in it.

After reading each of these stories you will be asked to make a choice. Remember, that you have the opportunity to do EITHER of the options which are presented.

Please answer as honestly as possible. There are no right or wrong answers.

a) In your garage you find a number of unused tins of emulsion (paint) that were left over from when you recently decorated your house. You no longer want the emulsion and it is taking up valuable storage space. You notice that the tins have a label stating that you need to allow the emulsion to set solid before it is disposed of with the general waste. This can be done quite easily by adding some sand which is something that you happen to already own. You mention the paint to someone who informs you that rather than throwing the paint away you could take it to a paint re-use centre where it will be re-distributed. You look into this and find that going to the re-use centre involves a long bus journey to the far side of town, carrying all the paint. However this would prevent the paint being wasted.

Which of the following would you do?

- Put sand in the paint and then throw it away once it has solidified
- Travel to the paint re-use centre

b) You find your job stressful and enjoy shopping for leisure at the weekends with your friends. You are all interested in fashion. You particularly enjoy treating yourself to new clothes. However, you have recently been made aware that cotton is one of the most pesticide intensive crops in the world. The clothing industry is therefore causing environmental damage and by shopping for leisure you are contributing to this problem. You find that it is possible to buy organic cotton which is grown in a more environmentally friendly way but that this is far more expensive and the range of designs is more limited.

Which of the following would you do?

- Buy non-organic cotton
- Buy organic cotton

c) You have a young family and two of your children still wear nappies (diapers). You have made the decision to purchase disposable nappies rather than reusable ones because it is one less thing to worry about. You think that using disposable nappies will save you time on laundry and give you more time in which to relax and be with your family. However, you notice that you have to dispose of a lot

of nappies each day. As a result you do a quick search on the internet and find an official report which states that that each baby uses more than 4,000 nappies before they are potty trained and that each nappy will take over 200 years to naturally degrade. The report also provides you with information on how to clean re-usable nappies with minimal harm to the environment. Using re-usable nappies will be better for the environment but will involve far more work for you.

Which of the following would you do?

- Use re-usable nappies
- Use disposable nappies

Study 5: Similar and dissimilar vignettes

As you read each of the stories, please take a little time to imagine yourself in the situation described. Even if you have never experienced the situation before, try to imagine yourself in it.

After reading each story you will need to make a decision. You have the opportunity to do either of the options which are presented.

Please respond to the information given in each story and note that in these vignettes, you have no restrictions on your budget, so there are no negative consequences of spending money.

Please answer as honestly as possible. There are no right or wrong answers.

a) Imagine that you are planning a journey to your work place. You own a bicycle and a car and live 11km (7 miles) from your work place. There is a good cycle route between your home and work. Today the weather is bad so your cycle ride will be very cold and wet. However, you can get showered at work once you arrive. Otherwise you could drive to work, and there is no indication that there will be any traffic jams. Cycling would be better for the environment but considering the bad weather driving would be more pleasant.

Which of the following would you do?

- Travel by car

- Travel by bicycle

b) Imagine that you are planning a journey to go and see friends for lunch. You don't intend to drink and you own a car, meaning that you have the option of driving into town and parking in the restaurant car park. Alternatively, you could catch the bus which would involve a five minute walk to the bus stop from your house. When you look through the window, however, you see that it is raining and windy outside. Taking the bus would be better for the environment, but considering the weather driving would be more pleasant.

Which of the following would you do?

- Travel by car
- Travel by bus

c) Imagine that you are at home after work and that you are planning a journey to the shops. You need to buy some bread and milk so that you have something for breakfast tomorrow, because you won't have time to buy anything in the morning. There is a local shop. The walk to the local shop is safe and it is still light outside, but you are feeling tired after a long day at work. The bus doesn't stop near the shop and there isn't a good cycle route. However, you own a car and have the option of driving and parking outside the shop. Altogether, a return journey in the car to the shop would take around 6 minutes, while a return journey on foot would take around half an hour. Walking would be better for the environment but considering how tired you feel driving would be easier.

Which of the following would you do?

- Travel by car
- Travel on foot

d) Imagine that you are planning a journey for a meeting in another city, approximately 71km (44 miles) away. You own a car and have the option of driving and there is no indication that you will encounter any traffic jams. If you drive the journey will take approximately one hour and fifteen minutes from door to door. If you take the train your journey will be approximately 20 minutes longer because you will need to cycle to the station. Whichever option you

choose (car or train) will not cost you any money because your employer will refund your travel expenses. Taking the train would be better for the environment, but considering the extra time needed to travel to the station, driving would be easier.

Which of the following would you do?

- Travel by car
- Travel by train

Appendix Four – Study 6: Piloting images

	M	SD
Dior (bag): Status goods	5.17	1.83
Dior (bag): Environment	1.17	0.41
Dior (watch): Environment	1.00	0.00
Dior (watch): Status	6.00	0.89
Louis Vuitton (bag): Environment	1.17	0.41
Louis Vuitton (bag): Status	4.50	1.87
Louis Vuitton (Kate Moss): Environment	1.00	0.00
Louis Vuitton (Kate Moss): Status	5.50	2.07
Channel (Audrey Tautou): Environment	1.33	0.82
Channel (Audrey Tautou): Status	6.00	1.10
WWF (trophy woman): Environment	6.17	0.75
WWF (trophy woman): Status	1.83	0.98
Greenpeace (woman): Status	1.17	0.41
Greenpeace (woman): Environmental	6.67	0.82
WWF (endangered beauty): Environment	5.83	1.60
WWF(endangered beauty): Status goods	1.83	1.33
Channel (Audrey Tautou): Environment	1.17	0.41
Channel (Audrey Tautou): Status	5.67	1.51
Vivienne Westwood: Environment	3.67	1.97
Vivienne Westwood: Status goods	5.67	1.86
WWF (woman rainforest): Environment	5.50	2.26
WWF (woman rainforest): Status	1.00	0.00
Gucci (man): Environment	1.17	0.41

Gucci (man): Status	5.67	1.97
Yves St Laurent (man): Environment	1.17	0.41
Yves St Laurent (man): Status	5.83	1.94
Ralph Lauren (Blue Polo): Environment	1.00	0.00
Ralph Lauren (Blue Polo): Status	6.00	1.10
TAGHeur (Golfer): Environment	1.00	0.00
TAGHeur (Golfer): Status	5.33	2.34
WWF (Fishman): Environment	6.67	0.82
WWF (Fishman): Status	1.17	0.41
WWF (Trophy Man): Environment	5.67	1.51
WWF (Trophy Man): Status	2.17	2.40
WWF Mounted head: Environment	6.17	1.60
WWF (Mounted head): Status	1.17	0.41
Greenpeace (man): Environment	6.67	0.52
Greenpeace (man): Status	1.17	0.41
Audi (cat): Environment	1.17	0.41
Audi (cat): Status	4.67	1.97
VW (owl): Environmental	2.17	0.98
VW (owl):Status	5.17	1.72
VW (Goat): Environment	1.83	0.98
VW (goat): Status	4.67	1.51
MIT (Rhino): Environment	2.50	1.38
MIT (rhino): Status	3.67	2.07
MIT (Horse): Environment	1.33	0.52
MIT (horse): Status	5.50	1.38
Hyundai (dog): Environment	2.17	1.94

Hyundai (dog): Status	3.33	1.21
Endangered Animal Trust (dead bird): Environment	6.50	0.84
Endangered Animal Trust (dead bird): Status	1.17	0.41
WWF (Polar bear):Environment	6.00	2.00
WWF (Polar bear): Status	1.33	0.82
BUND (time running out): Environmental	6.00	1.55
BUND (time running out): Status	1.00	0.00

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