iGreen: a social norms intervention to encourage pro-environmental behaviour

Kavita Patel

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Abstract

Previous research indicates that social norms interventions provide a promising avenue to encourage behaviour change. This study examined the efficacy of a social norms intervention, with the inclusion of personalised individual feedback, to encourage pro-environmental behaviour change. A qualitative approach was used to gain an in-depth understanding of how people respond to social norms feedback *and* personalised individual feedback on environmental behaviours.

Central to this research was an innovative *Facebook* app called iGreen, which was designed specifically by the author and a number of colleagues to provide a seven-week social norms intervention. This app comprised environmentally themed games, a quiz on aspects of everyday domestic behaviours that impact on the environment, and the ability to provide feedback on respondents' previous quiz answers. Respondents were randomly allocated to either a no feedback group, a personalised individual feedback group, or a group in which feedback also included the average quiz answer of other iGreen users (social norms feedback group). A sample of fifty-one people who used iGreen completed all quizzes, forty-four of these respondents completed a post-intervention questionnaire, and thirty respondents were interviewed. Drawing on elements of a discourse analysis approach to analyse the interviews enabled an in-depth understanding of why a social norms intervention might, or might not encourage pro-environmental behaviour and how people respond to personalised individual feedback and social norms feedback.

The major finding in this research is that the quiz encouraged behaviour change because the questions increased the salience of injunctive norms and personal norms. This supports the focus theory of normative conduct and norm activation theory, which both state that increasing the salience of norms influences behaviour. Another finding is that environmental behaviour change can be constrained due to people associating some behaviours with the stigmatisation of environmental activists. Lastly, respondents in all three intervention groups claimed to have changed some behaviour and there were no apparent differences between the groups. This suggests that increased salience (in this case induced by answering repeated quiz questions) encouraged behaviour change. This raises the question of whether increased salience, rather than feedback, may account for some of the behaviour change found in previous social norms research.

This research identifies key elements of an intervention that can increase its potential to encourage pro-environmental behaviour which has potential practical application in the design of innovative social norms interventions. The main contribution of this research is the discovery that making people's everyday behaviours more salient can encourage pro-environmental behaviour. A digital quiz is a simple, cost-effective and engaging method for increasing salience and encouraging behaviour change, and this should be explored in future research.

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1.0 Introduction

The research presented in this thesis was a case study that was a part of the CHARM project (Rettie, Burchell and Harries, 2013). CHARM was an interdisciplinary project funded by the RCUK Digital Economy Programme, and it was funded by the EPSRC[1]. The CHARM project examined whether everyday behaviours of individuals could be changed by providing them with digital feedback on their own behaviour and that of others - a technique known as the social norms approach. Social norms approach campaigns attempt to influence behaviour by providing individuals with information about what the majority of people do, or think should be done.

Extensive research indicates that people can be nudged into more socially desirable behaviours by providing them with feedback about their own behaviour and that of a relevant social group (Perkins and Berkowitz, 1986; Perkins, 2003; Borsari and Carey, 2003; Schultz *et al.* 2007; Neighbors *et al.* 2011). CHARM explored this approach by developing and testing non-invasive, low-cost digital technologies that provided respondents with feedback on individual and group information (Rettie, Burchell and Harries, 2013). There were three CHARM case studies: the *Home Energy Study*; *bActive*; and *iGreen*. This thesis presents the research from the third of these case studies; iGreen – the social media study.

This thesis explored the potential for using the social media platform *Facebook* and the social norms approach to encourage more pro-environmental behaviour. It examined the use of a bespoke Facebook app called iGreen to deliver personalised individual feedback and social norms feedback on aspects of everyday life that impact on the environment.

The aim of this research was to further our understanding of the complexity that underlies normative influences on behaviour. There is limited cross-disciplinary research (e.g. Foster *et al.* 2009) that has used technology-enabled feedback to encourage pro-environmental behaviour and this research also contributes to this area. This research has potential application in the design of new innovative technology to encourage socially desirable behaviours, in social norms interventions, for environmental initiatives and future research. This research will potentially contribute to major areas of current concern, including environmental conservation and climate change.

[1] The Engineering and Physical Sciences Research Council https://www.epsrc.ac.uk/

The purpose of the current chapter is to explain the approach used in this study and to introduce the research aims and objectives. The chapter begins with providing a definition of the concept of social norms used in this thesis and a summary of why social norms are of particular interest to this research. It then looks at the research problem: pro-environmental behaviour change. The chapter then provides a brief account of the historical development of Facebook, and an introduction to the increasing use of persuasive technology for research. The research questions that this study aimed to address are then outlined. The chapter ends with an outline of the thesis, briefly describing the contents of each chapter.

1.1 Social norms and behaviour change

The impact of norms on behaviour is well established and some scholars argue that social norms have widespread usage because they have the ability to predict human behaviour (Cialdini and Trost, 1998; Elsey, Eccles and Siddiqi, 2013). Within the social sciences, there is no widely accepted generic definition of the concept *social norms*, and there is no consensus as to the differentiation of types of norms. This research focuses on social norms from a social-psychological perspective. For the purpose of this thesis, it is necessary to specify what is to be understood by the concept of social norms, because this research specifically examines the *social norms approach* to behaviour change. In this thesis, the concept of social norms refers to 'rules and standards that are understood by members of a group, and that guide and/or constrain behaviour without the force of laws' (Cialdini and Trost, 1998, p.152). Cialdini, Reno and Kallgren (1990) provide a useful distinction between two types of social norms: descriptive social norms (beliefs about what is actually being done by others) and injunctive social norms (beliefs about what other people think should or ought to be done). This thesis adopts this distinction between these two types of social norms.

There is extensive research that suggests that people are influenced by information about what most other people do- that is *descriptive social norms* (McAlaney, Bewick and Bauerle, 2010). Written communication of descriptive social norms, for example: 'Most students have only 0 – 3 drinks on a night out', have been widely used in social norms approach campaigns aimed at substance use among young people. This approach is often used in commercial marketing campaigns in the form of statistics. For example, '98% recommend it' was used in Olay's Big British Beauty Poll (2010). Research shows that communicating such messages can influence health related behaviour (McAlaney Hughes and Bewick, 2011). Kinzig *et al.* (2013) suggest that if environmental social

norms are more widely shared, this has the potential of environmentally friendly behaviour becoming more pervasive. More research using the social norms approach to encourage pro-environmental behaviour change is required (Foster and Linehan, 2013). Therefore, the current study explored the efficacy of the social norms approach to encourage pro-environmental behaviour. The next section explains why environmental behaviour is the focus of this research.

1.2 The research problem: encouraging pro-environmental behaviour

Several scholars have explored why people may behave in environmentally sustainable ways and what prevents them from adopting pro-environmental behaviour (Kollmuss and Agyeman, 2002; Lorenzoni, Nicholson-Cole and Whitmarsh, 2007). Pro-environmental behaviour refers to behaviour that reduces the negative impacts of one's actions on the world, such as reducing resource consumption (use of water and energy) and reducing waste (Kollmuss and Agyeman, 2002).

In the UK over the last two decades, there have been extensive attempts to promote pro-environmental behaviour, such as educational information campaigns. These information based approaches to behaviour change rest on the assumption that people are rational and can make systematic use of environmental information (Kollmuss and Agyeman, 2002). Blake (1999) argues that most environmental information campaigns are not successful because people are not always rational beings who will make meaningful use of environmental information. Alternative approaches are required when environmental education alone is insufficient (Kinzig *et al.* 2013).

The environmental psychology literature provides an insight into a range of influences on people's attitudes and behaviours towards environmental problems (Kollmuss and Agyeman, 2002). Several models have been proposed to demonstrate these various influences. For example, research that investigates the relationship between attitude and behaviour has often been conducted within the framework of the theory of planned behaviour (Ajzen and Fishbein, 1980; Hing Lo *et al.* 2013). In contrast, the value belief norm theory suggests that values, morals and personal norms are significant predictors of environmental behaviour (Stern, 2000). However, it has been argued that these models, like some environmental educational initiatives, present an overly rational perspective of behaviour (Lorenzoni, Nicholson-Cole and Whitmarsh, 2007).

An alternative approach to understand how people respond to environmental information and how this may lead to pro-environmental behaviour change has been demonstrated by Hobson's (2001a;

2003) Action at Home[1] research. She uses Giddens' structuration theory to explain why when people are exposed to environmental educational they nevertheless continue to behave in ways that are not environmentally sustainable.

Hobson (2001a) used qualitative research methods to explore how participants of an environmental programme responded to environmental information. Hobson reported that participants questioned the reliability of the environmental information and that the global issues highlighted in the packs were not meaningful to them. As argued earlier in this chapter, providing individuals with environmental information does not necessarily result in pro-environmental behaviour change. Hobson suggests that this may be because people tend not to consider the environmental implications of their everyday behaviours.

Although the Action at Home programme did seem to encourage some participants to make some pro-environmental behaviour changes, Hobson concluded that this was not because they were learning new environmental facts and acting upon them. Hobson argued that the behaviour changes occurred as a process of questioning taken-for-granted behaviours. Hobson drew on Giddens' (1984) structuration theory to understand the processes underlying her participants' behaviour change. Structuration theory focuses on the processes of everyday life and the role of these processes in ordering society (Hobson, 2001b, p.5). Giddens' (1984) theorises two forms of consciousness that are at the centre of these processes: one that is implicit and tacitly known and cannot be articulated (practical consciousness), and another that is overt and can be verbally expressed (discursive consciousness). These forms of consciousness theorised by Giddens may explain why people are unaware of some of their behaviours that are not environmentally sustainable; because they are performed in the implicit and tacit form of knowledge. Therefore, making people aware of their everyday behaviours, and bringing them into the overt knowledge that can be verbally expressed, may encourage individuals to reconsider the environmental consequences of their behaviours.

Hobson (2003) stated that one possible explanation for pro-environmental behaviour change in her study was that the questioning made people more aware of their habits. Making people consider their everyday behaviours and taking them through their daily flow of routines seemed to have

[1] See Global Action Plan UK http://www.globalactionplan.org.uk/

encouraged participants to consider the practices that were usually unnoticed in the practical consciousness, and reading the information packs and answering questions brought habits into the discursive consciousness. Hobson's conclusion that new information interacts with individuals' knowledge and creates a questioning of their daily lives is a noteworthy idea that is worth exploring.

Some environmental campaigns suggest that more information is required to overcome public ignorance, but Hobson (2003) argues that practices which impact on the environment are more likely to change when people make connections between forms of knowledge and their own everyday behaviour. The current study aimed to extend Hobson's work by exploring how people responded to feedback on their own everyday behaviours that impact on the environment. This thesis also drew on Giddens' structuration theory to understand the underlying processes that occurred when respondents were provided with feedback. Giddens (1984) argues that everyday behaviours, such as those that involve the consumption of environmental resources, are not simply mundane actions but rather daily habits that constantly create and recreate social ordering. Drawing on Giddens' structuration theory and Hobson's framework, the present thesis explored the possibility of changing behaviour by questioning people on their own everyday behaviours and providing them with feedback on them. The feedback was administered using a social media app; literature on the use of social media in research is discussed in the next section.

1.3 Using social media in a social norms intervention

This study used the social media platform *Facebook* in a social norms intervention to encourage pro-environmental behaviour. Technologies are increasingly being used to nudge people towards positive changes in health related behaviours, such as fitness (Foster, *et al.* 2010; Harries *et al.* 2013a) and reduced alcohol consumption (Ridout and Campbell, 2014). However, there is limited research that has used social media in social norms interventions to encourage pro-environmental behaviours (e.g. Foster *et al.* 2009). Thus, the present study examined the use of a Facebook app in a social norms intervention in the context of environmental sustainability.

Facebook is a social networking site founded in 2004. Social networking sites emerged in the 1990s as online infrastructures that enabled individuals to create profiles that reflected their identities and to interact with other users. Social networking sites allow users to communicate with others separated by time and/or distance and to share personal information (Bose, 2007; Eisenmann and Feinstein, 2008). Facebook is the most popular social networking site and one of the most visited

websites worldwide with over one billion active users (Facebook Newsroom, 2015[1]). Over 30 million people in Britain use Facebook every month and 72% of them use it daily[2].

Due to the popularity of Facebook, it is an ideal platform to reach many people and raise their awareness of environmental concerns and potentially encourage behaviour change. As Facebook also enables the development of apps and their promotion, it seemed an ideal platform for this research. Using Facebook to conduct research and influence socially desirable behaviour has been suggested by a number of scholars (Mankoff *et al.* 2007; Nazir, Raza and Chuah, 2008; Foster *et al.* 2009; Ridout and Campbell, 2014). However, some (Foster, Linehan and Lawson, 2011; Ridout and Campbell, 2014) argue that the amount of Facebook apps that have been assessed in an academic context for this purpose is limited, and the process of using digital technology to influence behaviour change is not yet understood. This thesis contributes to this area by examining the efficacy of delivering a social norms intervention using a Facebook app.

1.4 Research aims and objectives

The aim of this research was to investigate the efficacy of a social norms intervention to encourage pro-environmental behaviour and to understand how and why it might encourage behaviour change. Following the interpretation of the intervention, qualitative interviews explored how participants constructed and recounted their experience of it. The objectives of the qualitative interviews were to understand: the taken-for-granted conceptions that underlie normal everyday behaviours that impact on the environment and their susceptibility to change; the ways in which the conceptions of everyday behaviours are informed and questioned by feedback; and the role of a Facebook app in delivering a social norms intervention.

The research problem can be summarised as:

Can the social norms approach be used in a social media app to encourage more pro-environmental behaviour? If so, how?

The overarching purpose of this study is relatively broad; therefore the research focused on the three following research questions (RQs):

[1] http://newsroom.fb.com/Key-Facts
[2] Source: Huffington Post, 2014

RQ1. Did the social norms approach lead to any behaviour change?

This question explored whether there were any pro-environmental behaviour changes following the social norms intervention. The intervention included a Facebook app called iGreen and a quiz which scored respondents' lifestyles on a periodic basis in terms of a number of different behaviours that impact on the environment (e.g. water consumption, energy usage, recycling). Some respondents received personalised individual feedback and/or social norms feedback on their behaviours. The aim was to see whether respondents reported any changes in their behaviour following the intervention and which behaviours they claimed to change. This research also explored if there were any behaviours that respondents did not change following the intervention and why. This gave insight into the use of the social norms approach to encourage pro-environmental behaviour.

RQ2. How do people respond to individual feedback and social norms feedback and are there any differences between the three groups?

This question explored whether there were any differences in the behaviour changes amongst people that were provided with feedback and those who received no-feedback, as well as to explore the impact of personalised individual and social norms feedback. The aim was to gain an insight into participants' responses and reactions to feedback on some of their everyday environmental behaviours and if there were any differences in how people responded to the different types of feedback. The research also examined any differences in the discourses that respondents in the three groups used to explain their behaviour.

RQ3. What discourses do respondents use when discussing the impact of the intervention and what can be interpreted from these discourses?

Following the intervention in this study, qualitative in-depth interviews were used to explore the impact of the intervention and feedback on participants' behaviours. The aim was to gain an insight into the discourses that participants employed to justify any changes they claimed to make about their behaviour and to consider the potential theoretical and practical implications of these discourses. It has been argued that discourses shape the way in which people interpret environmental issues and some research has shown the usefulness of identifying the discourses people use to better understand how they respond to environmental information (Dryzek, 2005; Hobson and Niemeyer, 2011). Therefore, this research explored participants' discourses related to their everyday environmental behaviours. It is assumed that an understanding of these discourses will help to explain why people continue to behave in ways that are not environmentally sustainable

despite being aware of the importance of environmental protection, and may inform the environmental agenda on pro-environmental behaviour change. The discourses may also provide an understanding of the differences between environmental behaviour people change and those they do not change. This will highlight particular behaviours that require attention in future initiatives to encourage more pro-environmental behaviour.

1.5 Thesis outline

This final section of the chapter provides a brief description of the chapters that follow.

Chapter Two: Theories of normative influence

There are many normative theories in social-psychology that suggest that different types of norms influence human behaviour and chapter two critically reviews some of these theories. For example, norm-activation theory states that the activation of personal norms leads to socially desirable behaviour. The theory of planned behaviour uses the term subjective norm to signify the amount of pressure an individual perceives to perform an action (Ajzen and Fishbein, 1980). In contrast, the value belief norm theory suggests that values, morals and personal norms are significant predictors of behaviour (Stern, 2000). These theories concern moral obligations, individual attitudes, values and beliefs as predictors of behaviour. However, some literature suggests that behaviours are not always influenced by changes in attitudes or values, but by subtle forms of social influence such as social norm messages (Southerton, 2012; Kinzig *et al.* 2013). This thesis is influenced by this theory and therefore the latter part of chapter two focuses on social norms theory and research. A detailed review of social norms approach research is provided to illuminate the non-invasive approach's potential to encourage socially desirable behaviour. A review of some successful and failed social norms campaigns provides an insight into key principles that can improve social norms interventions. The chapter also provides a justification for further research using the social norms approach, particularly in the environmental sustainability domain.

Chapter Three: Methodology

This chapter includes a detailed description and justification of the research methods used for the data collection and analyses for this study. A mixed methods approach was used and the quantitative and qualitative data were treated as complementary. A Facebook app including a quiz was used to execute the social norms intervention, a post-study questionnaire enabled the collection of demographic data, and qualitative in-depth guided interviews with open-ended questions focused on the main aim of the study; to understand respondents' interpretations, experiences and meanings about the impact of the social norms intervention. The advantages and limitations of these methods are discussed in this chapter. An explanation of how the ethical issues in this study were addressed is provided. The chapter ends with a description and justification of the different data analysis strategies employed to analyse the data collected.

Chapter Four: Did the iGreen intervention encourage behaviour change?

This chapter presents the analysis of the data which focuses on answering the first research question that this thesis aims to answer. The chapter presents evidence that suggests respondents changed some of their behaviours and which behaviours they claimed to change. The latter part of the chapter presents data indicating that respondents were unwilling to change some behaviours. The discourses respondents use to justify their unchanged behaviours are presented and interpretations of the discourses are offered. Each argument put forward is illustrated with a detailed analysis of one or more excerpts from the interviews, and where relevant, by analyses from the quiz and questionnaire data.

Chapter Five: Behaviour change: discourses used by all participants

Chapter four having discussed the pro-environmental behaviours that respondents claimed they had changed, those they had not changed, and their explanations for the latter, chapter five moves on to look at the discourses respondents use to explain the behaviour they had changed following the social norms intervention. This chapter addresses the third research question.

Chapter Six: Behaviour change: discourses used by the different groups

Chapter six addresses research questions two and three. It concentrates on any differences in the discourses used by respondents in the three intervention groups. The chapter also describes any differences between the three intervention groups in regards to their reported behaviour changes. The impact of individual and social norms feedback is also discussed.

Chapter Seven: Discussion and Conclusion

The final chapter of this thesis draws together the findings presented in chapters four, five and six and considers the broader theoretical implications of those findings. The researcher discusses the practical implications of the findings for future research using social media and the social norms approach to encourage pro-environmental behaviour change. The chapter also critically reflects on the research methods used and provides some suggestions for future research that uses social norms interventions.

2.0 Theories of normative influence

Central to this thesis is social norms theory, which underlies the intervention used in this research. Informed by relevant literature on social norms research, this chapter recognises the potential of a social norms intervention to encourage pro-environmental behaviour change.

Before discussing social norms theory, it would be useful to critically review other theories of normative influence. There is a vast literature on norms and they have been conceptualised in different ways in several theories. For instance, personal norms relate to norm activation theory and value belief norm theory, the subjective norm relates to the theory of planned behaviour, and social norms relate to the social norms approach and the focus theory of normative conduct. These theories are discussed in this chapter to construct a picture of current knowledge on the impact of different norms to influence behaviour. Although this chapter looks at all of these theories, it is important to note that the social norms approach is the main focus of this study.

The chapter begins with a discussion on personal norms and its relation to norm activation theory and value belief norm theory. The chapter then looks at the subjective norm in the theory of planned behaviour. Although these theories provide useful explanations for normative influences on pro-environmental behaviour, it is argued that pro-environmental behaviour can also be influenced by the subtle influence of social norms. The second part of the chapter moves on to reviewing social norms theory, and the emphasis changes from personal and individual influences on behaviour to social influence. After a discussion of social norms theory, the chapter focuses on research on the social norms approach. This chapter demonstrates that the social norms approach has been successfully used in educational settings to influence student health behaviour. The literature indicates the potential of using the social norms approach to encourage other socially desirable behaviour, such as pro-environmental behaviour, but more research is needed to explore this and to understand why and how social norms may influence pro-environmental behaviour change via a social norms intervention. The chapter then briefly discusses social identity theory and how it can be applied to the study of normative influence on environmental behaviour change. Finally, the chapter focuses on the importance of discourse theory to understand social norms about environmental behaviours. It is explained that using a discourse theoretical framework in this study can advance our understandings of how and why social norms guide social action, as well as provides an innovative interpretation of the social norms approach to encourage pro-environmental behaviour.

It is argued that what influences pro-environmental behaviour is complex and that developments in theory and research on norms provide an understanding of how different types of norms and other influencing elements interact and can encourage behaviour change. The variety of norms discussed in this chapter, and their associated theories, are summarised in table 2.1.

Table 2.1 Summary of types of norms[1]

Norm type	Norm sub-type	Definition	Associated theory
Personal	Introjected	Personal norm that is enforced by anticipated guilt or pride	Norm activation theory; Value belief norm theory
	Integrated	Personal norm that is deeply internalised and there is no requirement for anticipated guilt or pride to influence an individual's behaviour	
Subjective		An individual's perception of what most people who are important to him/her think he/she should or should not do	Theory of planned behaviour
Social	Descriptive	Specify what most people do	Social norms approach; Focus theory of normative conduct
	Injunctive	Specify what ought to be done; what people approve and disapprove; enforced by social sanctions	

2.1 Personal norms

Personal norms are moral obligations that are reinforced through an internalised sense of duty to behave in a particular way (Schwartz, 1977; Vandenbergh, 2005). Personal norms arise from shared expectations in social interaction. Whilst personal norms may originate in social interaction, they influence behaviour regardless of socially mediated sanctions or external reinforcement. When a norm has been internalised, it becomes integrated into an individual's self-concept. Therefore, personal norms guide behaviour because of self-expectations, *not* social-expectations (which is the case for social norms). People adhere to personal norms because violating them can lead to sanctions that stem from the individual's self, such as anticipation of guilt, loss of self-esteem, or on the other hand, conforming to personal norms can lead to pride and enhanced self-esteem. Norm

[1] Definitions are adapted from Schwartz's (1973, p.353) concept of personal norm, Cialdini, Kallgren and Reno's (1990, p.1015) concepts descriptive and injunctive social norms, and Ajzen's concept of the subjective norm (1991, p.188).

activation theory and value belief norm theory relate to personal norms and these theories are discussed in the following sections.

2.1.1 Norm activation theory

Schwartz (1970) originally developed norm activation theory to provide an understanding for pro-social and altruistic behaviours, but it has been widely used to examine various socially desirable behaviour (such as pro-environmental behaviour). Norm activation theory provides an explanation for the relationship between personal norms and pro-social behaviour. Norm activation is 'a directing of attention to expectations sufficient to bring them into the stream of information processing' (Schwartz, 1977, p.225). In other words, pro-social behaviour can be prompted by an experience that activates a personal norm that defines the appropriate response in a given situation. Schwartz (1970, p.283) suggests that the activation of personal norms varies with the salience of the 'awareness of consequences' (AC) and the 'ascription of responsibility' (AR). The AC is how aware an individual is that their potential actions have consequences for the welfare of others. The AR is the acceptance of personal responsibility that the individual holds for these consequences. Differences among individuals in their tendency to become aware of consequences or to accept responsibility will similarly affect the activation of personal norms and their subsequent behaviour. Denial of consequences and responsibility also affects activated personal norms and thus fail to influence an individual's behaviour.

Schwartz (1973) argues that the acceptance or denial of personal norms provides an explanation of individual differences in behaving in a pro-social way, whereas social norms cannot. His argument is supported by research on the activation of personal norms and their influence on various altruistic behaviours. For example, his studies on volunteering to donate bone marrow to a stranger suggested that personal norms had a substantial impact on volunteering behaviour but only when they were activated, and that individual differences in denying responsibility influenced whether the personal norm encouraged volunteering behaviour. Schwartz argues that the activation of personal norms is directly influential in guiding pro-social behaviour. His argument is corroborated by several subsequent studies on altruistic behaviour, such as volunteering to donate an organ (Fellner and Schwartz, 1971; Schwartz and Tessler, 1972), helping people in trouble (Schwartz and BenDavid, 1976), and intentions to purchase lead-free gasoline (Heberlain and Black, 1976).

As norm activation theory can be used to explain pro-social behaviours, it has been applied extensively to understand and predict pro-environmental behaviour. Heberlain (1972) suggests that

the theory can be applied to explaining pro-environmental behaviour because environmentalism is considered a moral issue. He suggests that pro-environmental behaviour occurs in response to personal norms that are activated when an individual is aware of the deleterious consequences of their behaviour on the environment (AC) and feels responsible that their actions could avert those consequences (AR).

Many studies have demonstrated that the activation of personal norms can influence pro-environmental behaviour change (Stern, Dietz and Black, 1986; Schultz, 1999; Thøgersen, 2006; Harland, Staats and Willke, 2007). For example, Van Liere and Dunlap (1978) claim that norm activation theory is useful for understanding pro-environmental behaviour based on their study of burning of garden waste. They found that people who accepted responsibility for their burning and its consequences would be less likely to burn garden waste than those who were unaware of the consequences. In their study on energy consumption, Black, Stern and Elworth (1985) found that the activation of personal norms was a significant predictor of many energy saving behaviours. More recently, research has shown that the activation of personal norms can encourage behaviours that reduce CO_2 emissions (de Groot and Steg, 2009), reduce the use of plastic bags (de Groot, Abrahamse and Jones, 2013) and predict energy behaviours in different domains, such as transport and energy use in the house, reflecting direct as well as indirect energy use (van der Werff and Steg, 2015).

Although the research discussed in this section suggests that the activation of personal norms can influence pro-environmental behaviour, Thøgersen (2006) claims that the motivational content of personal norms is ambiguous. He argues that the general assumption that the activation of personal norms influences pro-environmental behaviour due to anticipated guilt may often be unfounded. His argument is based on research that suggests that although anticipated guilt can influence an individual's behaviour, sometimes personal norms are more deeply internalised and there is no requirement for anticipated guilt or pride to influence an individual's behaviour.

Thøgersen (2006) suggests that it may be useful to distinguish between different levels of internalisation of personal norms as they may have different effects on behaviour. His theory distinguishes two types of personal norm: introjected norms and integrated norms. Introjected norms are superficially internalised and enforced by anticipated guilt or reward. Integrated norms are more deeply internalised, and behaviour influenced by these norms will not be enforced by guilt

or pride. His research suggests that the activation of integrated personal norms are more likely to encourage pro-environmental behaviour in comparison to superficial introjected personal norms.

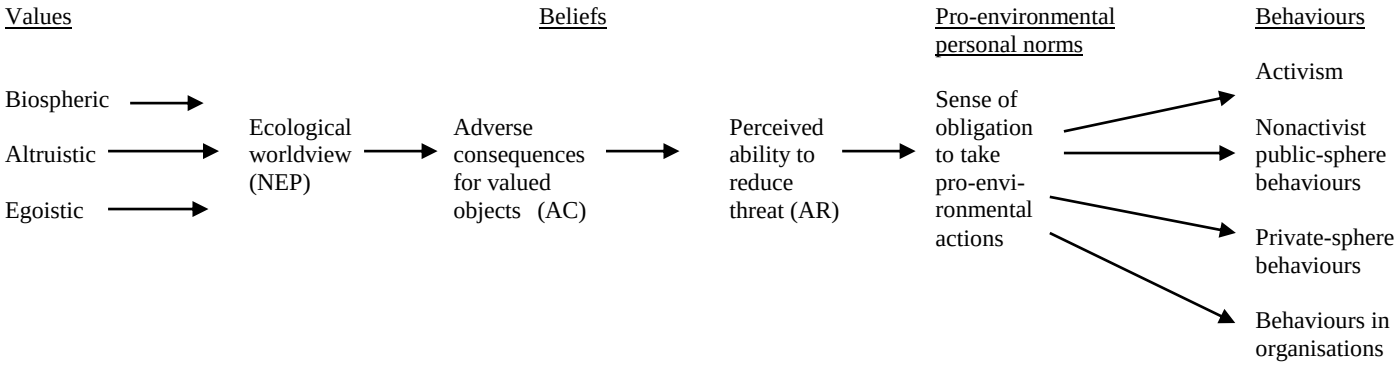
Thøgersen's (2006) theory that the activation of more deeply internalised personal norms is more likely to influence pro-environmental behaviour may explain why some people adopt more pro-environmental behaviours than others. For some individuals, behaving in pro-environmental ways may be an influence of an activation of integrated norms and this leads them to behave environmentally due to a sense of intense moral obligations, rather than feeling guilty. Similarly, the value belief norm theory states that personal norms to behave in pro-environmental ways are activated by integrated beliefs that environmental conditions threatens things that the individual values (Stern, 2000). In other words, individuals who hold strong pro-environmental values are more likely to engage in pro-environmental behaviours than those who do so due to anticipated guilt. The value belief norm theory is reviewed in the next section.

2.1.2 Value belief norm theory of environmentalism

Stern *et al.* (1999) adapted Schwartz's norm activation theory to incorporate values, beliefs and norms in order to create a framework to examine pro-environmental behaviour. Like norm activation theory, the value belief norm theory states that people will engage in pro-environmental behaviour when the situation they are in activates their personal norms (Stern, 2000). However, the value belief norm theory suggests that values also play an important role in activating personal norms. Values are defined as desirable end states that transcend specific situations (Dietz, Fitzgerald and Schwom, 2005). For instance, an individual may attend an environmental meeting because they value wildlife.

The value belief norm theory model (figure 2.1) can be used to predict pro-environmental behaviour. Values are fundamental in the theory, and therefore appear first in the figure as they affect behaviour more than the other variables within the model. The model distinguishes between three values; egoistic, altruistic and biospheric values. Biospheric values are held by those who find environmental threats a problem due to its impact on the biosphere, including plants, animals, the rainforest and the sea. People with altruistic values are concerned about the environment's impact on other people, such as children, future generations and other humans in general. In contrast, egoistic values refer to an individual's concern for the environment due to the direct impact it has on them, and therefore they only consider environmental issues if they are personally affected.

Figure 2.1 Value belief norm theory of environmentalism (Stern, 2000, p.412)



As illustrated in the figure, values exert their effects on the other components and directly influence beliefs, which sequentially affect personal norms and then individual behaviour. The causal chain shown in the figure moves from values to the ecological worldview (new ecological paradigm). This is the acceptance that human behaviour has substantial adverse effects on the environment. Personal norms to engage in pro-environmental behaviour are then activated by an individual's beliefs that the environment has adverse consequences (AC) for the self or close kin (egoistic value), for other people (altruistic value), or for other species or ecological systems (biospheric value), and by ascription of responsibility (AR) for taking corrective action to prevent those consequences (Stern and Dietz, 1994).

According to Stern *et al*. (2000, p.412), the value belief norm theory provides 'the best explanatory account of a variety of behavioural indicators of non-activist environmental behaviours'. This theory is supported by Stern *et al.'s* comparison of the value belief norm theory to other theories (e.g. cultural theory; theory of post-materialist values). The researchers found that the value belief norm theory's variables were much stronger predictors of each behavioural indicator than the other theories, even when the other theories were combined. The results provide strong support for the value belief norm theory. Furthermore, much of the value belief norm theory research suggests that values and personal norms are significant predictors of pro-environmental behaviour and that these norms are activated just as the norm activation theory specifies (Black, Stern and Elworth, 1985; Stern and Oskamp, 1987; Guagnano, Stern and Dietz, 1995).

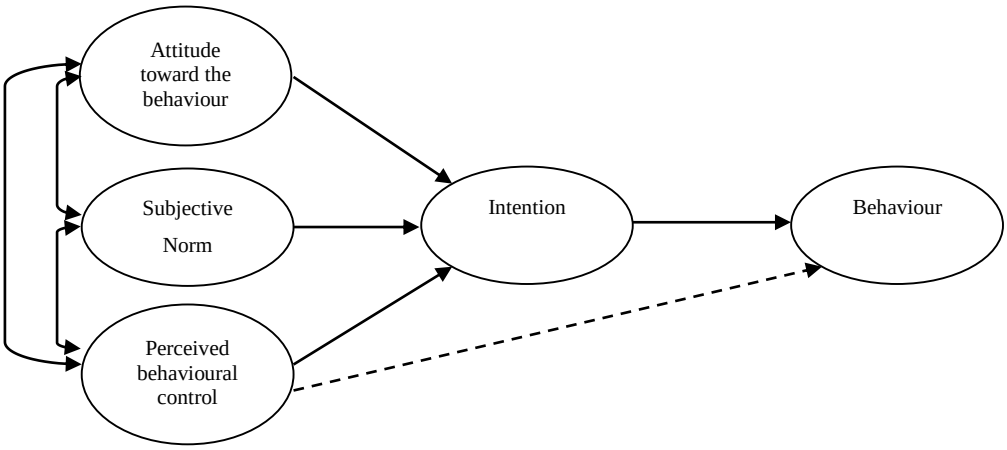
Jackson (2005) argues that the value belief norm theory is problematic because Stern *et al.'s* (1999) research showed a relatively weak relationship between personal norms and pro-environmental behaviour. Although Stern *et al.'s* (1999) study showed that the value belief norm theory's

variables performed better than the competing theories' variables, it nevertheless accounted for only 35% or less of the variance in the environmental behaviours examined (willingness to sacrifice, consumer behaviour and environmental citizenship). Jackson (2005) suggests that the role of situational factors may improve the explanation of behavioural variance as theories relating to values and personal norms fail to incorporate the social context in which the behaviour occurs. Situational factors and the social context may indeed interfere with one's values and the activation of personal norms to influence pro-environmental behaviour. For example, one may abandon their vegetarian values and beliefs when taken to a restaurant by a group of managers, who all order meat, in an attempt to fit in or impress them. The theory of planned behaviour deals with the influence of the social context on an individual's behaviour, namely the subjective norm.

2.2 Subjective norm

In Ajzen's (1991) theory of planned behaviour, an individual's intention is central to perform a particular behaviour. Based on his research, Ajzen argues that an individual's intentions to engage in various types of behaviours (e.g. pro-environmental behaviour) can be predicted with high accuracy from their attitude towards the behaviour, subjective norm and perceived behaviour control (illustrated in figure 2.2).

Figure 2.2 The theory of planned behaviour (Ajzen, 1991, p.182)



As presented in the figure, the subjective norm in combination with attitude and perceived behavioural control is a predictor of intention, which then predicts behaviour. A subjective norm refers to an individual's perception of what most people who are important to him/her think s/he should or should not do in a particular situation (Ajzen and Fishbein, 1980). Attitudes refer to an overall evaluation or belief, positive or negative, about a behaviour, person or place. Perceived

behavioural control is the extent to which an individual believes that they have the ability to perform the behaviour. For example, if an individual assumes that a behaviour will be difficult, their perceived behavioural control will be low.

Ajzen (1991, p.188) argues that the theory of planned behaviour can also explain variance in behaviour, not just predict it. He states that 'the relative importance of attitude, subjective norm, and perceived behavioural control in the prediction of intention is expected to vary across behaviours and situations'. Therefore, according to Ajzen, the extent of the relationship between intentions and perceived behavioural control is dependent on the type of behaviour and situational context. In some situations, all three variables can account for intentions, whilst in others only attitudes will have a significant impact on intentions, or attitudes and perceived behavioural control will account for intentions. For example, in their research on the theory of planned behaviour, Trafimow and Finlay (1996) found a distinction between people whose behaviour was influenced by their attitudes, and those whose behaviour was influenced by subjective norms.

The theory of planned behaviour has been considered an important theory across an extensive range of behavioural domains and has been supported by some research evidence (Ajzen, 1991; Beck and Ajzen, 1991; Hrubes, Ajzen and Daigle, 2001). For example, Armitage and Conner's (2001) meta-analytical review of research on the theory of planned behaviour showed that the perceived behavioural control variable accounted for significant amounts of variance in intention and behaviour. However, they found the subjective norm variable was a weak predictor of intentions in comparison to the other variables within the theory of planned behaviour model. It should be noted that Ajzen (1991) did argue that the impact of attitudes and subjective norms on behaviour varies across individuals, and therefore he accounts for the differences in predictive strengths of subjective norms.

Research suggests that knowing one's previous behaviours can also enhance the relationship between attitudes and behaviour to increase the prediction of intentions, and therefore behaviour. For example, research on the theory of planned behaviour and environmental sustainability suggests that knowing one's previous recycling behaviours and their perception of available recycling facilities increased the researchers' ability to predict the individual's intentions to recycle (Knussen *et al.* 2004; Nigbur, Lyons and Uzzell, 2010). Therefore, when other factors that affect intentions are added to theory of planned behaviour, this can strengthen predictions of behaviour. This demonstrates the general applicability of the theory to predict behaviour.

The simplicity of the theory of planned behaviour model has also formed the basis of its critique. The theory of planned behaviour is based on the premise that attitudes and perceived behavioural control are the primary determinants of behaviour intentions (Ajzen, 1991). It does not allow consideration of objective constraints that may restrict consequential behaviours. The theory of planned behaviour has also been criticised for not including moral norms. The moral meaning of norms refers to the idea that some types of behaviour are either right or wrong regardless of their personal or social consequences as in the subjective norm (Manstead, 2000). Schwartz and Tessler's (1972) research on organ donation suggests that moral norms are better predictors of behaviour intentions than subjective norms. They reported that moral norms improved the prediction of behaviour intentions significantly more than attitudes and subjective norms.

The addition of different norms, such as moral norms, to the theory of planned behaviour may increase its ability to predict behaviour. Fishbein and Ajzen (1975) argue that different norms are important components of normative influence in the relationship between attitude and behaviour and suggest that they should be combined. Conner and Armitage's (1998) review of research on the theory of planned behaviour suggests that different types of norms (descriptive norms and moral norms) are predictive of intentions. White *et al.'s* (2009) research on recycling behaviours supported the theory of planned behaviour but with the inclusion of descriptive social norms and injunctive social norms in order to predict recycling intentions. Therefore, it has been shown that combining social norms with attitudes predicts behaviour better than the variables in the theory of planned behaviour model alone (Cialdini and Trost, 1998). This thesis, therefore, focuses on the efficacy of social norms in an intervention to encourage pro-environmental behaviour.

Summary of theories on personal and individual influences on behaviour

Before examining the literature on social norms, it would be useful to briefly review the theories already discussed. The norm activation theory, theory of planned behaviour and value belief norm theory all provide explanations on personal and individual influences on behaviour, such as personal norms, values and intentions. In his norm activation theory, Schwartz (1973) emphasises the activation of personal norms influencing socially desirable behaviour. There is substantial evidence supporting this theory and it seems plausible that activating personal norms can encourage particular behaviours, including pro-environmental behaviour.

Stern *et al.* (2000) also stress the importance of personal norms in their value belief norm theory, but also state that values and beliefs influence pro-environmental behaviour. On the other hand, the theory of planned behaviour states that pro-environmental behaviour can be influenced by attitudes, perceived behavioural control, subjective norm, and intentions. Whilst Ajzen (1991) stresses the role of intentions and their impact on behaviour, Stern *et al.* emphasise the role of personal norms stemming from underlying values. Both theories have some research evidence supporting them (discussed earlier). Kaiser, Hübner and Bogner's (2005) comparison of the theory of planned behaviour and value belief norm theory showed that they are both significant in explaining pro-environmental behaviour. The variable of intentions in the theory of planned behaviour accounted for 95% of the variance in people's pro-environmental behaviour, and personal norms in the value belief norm theory accounted for 64%. Both theories are useful in providing ways to predict and explain pro-environmental behaviour. However, the theories seem to present an overly rational approach to behaviour as people are not always influenced by changes in attitudes or values, but by subtle forms of social influence such as social norm messages (Cialdini, Reno and Kallgren, 1990). Therefore, this thesis considers the influence of social norms to take this study forward.

It should be noted that some research suggests that personal norms are more influential than social norms in encouraging pro-environmental behaviour. Schwartz (1977) notes that activating personal norms are more significant than social norms in influencing particular behaviours. This is because the influence of personal norms represents conforming to one's expectations of the self, leading to feelings of self-approval rather than general social-approval. This distinction between the influence of self-approval and the influence of social-approval on behaviour has led Schwartz to argue that social norms have little effect on behaviour beyond that exerted by one's own personal norms. Some authors support this argument because research suggests that people need to care about climate change in order to be motivated to behave in pro-environmental ways (Lorenzoni, Nicholson-Cole and Whitmarsh, 2007). This seems conceivable because norm activation research indicates that people act on personal norms to avoid guilt, whether or not other people disapprove (Black, Stern and Elworth, 1985; Guagnano, Stern and Dietz, 1995; Thøgersen, 2006). Thus, some authors (Pelletier *et al.* 1998; Ryan and Deci, 2000; Koger and DuNann Winter, 2010) consider personal norms more powerful than social norms because when people adopt pro-environmental behaviour due to intrinsic reasons (e.g. a concern for protecting the environment), they will engage in pro-environmental behaviour more regularly than people who behave due to extrinsic reasons, such as for social approval or due to group pressure.

Whilst some research suggests that personal norms are more influential than social norms in influencing people to behave in more environmentally sustainable ways, there is also research suggesting that social norms can influence pro-environmental behaviour (Cialdini, Reno and Kallgren, 1990; Kallgren, Reno and Cialdini, 2000; Schultz *et al.* 2007; Nolan *et al.* 2007) and this is discussed later in this chapter. Furthermore, people may engage in particular behaviours not because of personal norms but because they want to be accepted or gain social approval from others (Kinzig *et al.* 2013). Some authors (Kinzig *et al.* 2013) suggest that pro-environmental behaviour may increase if more efforts are made in changing personal *and* social norms because certain behaviours will become ingrained (personal norms) or enough people with social influence will adopt these norms and others will conform. Thus, it would be worth examining the influence of both personal norms and social norms to encourage pro-environmental behaviour change.

Social norms may complement the effects of personal norms as social norms and personal norms often function in parallel. For example, an individual who holds personal norms about protecting the environment might feel guilty for missing an environmental community meeting after hearing that most of their friends attended (Koger and DuNann Winter, 2010). There is often an overlap between personal and social norms, but whilst social norms are shared, personal norms tend to vary between individuals. Although social norms and personal norms may function in parallel, it seems that the two types of normative explanation are different. This thesis treats them as separate normative influences on behaviour and considers how norm activation theory *and* social norms theory can provide insight into explaining pro-environmental behaviour as a result of an intervention. As the norm activation theory has already been discussed (section 2.1), the next section looks at social norms theory.

2.3 Social norms theory

Extensive research on social influence indicates that individual behaviour is affected by observing the behaviour of others (Sherif, 1936; Asch, 1952; Milgram, 1974). In the past twenty years, there has been a progressive increase in research within this area (Cialdini and Goldstein, 2004; Smith *et al.* 2012). Several of these studies focus on social norms as the primary method for influencing individual attitudes and behaviour. As defined in chapter one, social norms are ‘rules and standards that are understood by members of a group, and that guide and/or constrain behaviour without the force of laws’ (Cialdini and Trost, 1998, p.152). Social norms research aims to find ways to encourage socially desirable behaviour, and the technique used in the research has been termed the

social norms approach. The current study focuses on the social norms approach, and research on it is discussed in the next section. The present section focuses on the theory underlying the approach.

Social norms theory is based on the principle of conformity; that individuals are influenced by others and conform to what the majority do and believe (see Asch, 1952). Research on conformity has been influential in the development of social norms research (Cialdini and Trost, 1998). Deutsch and Gerard (1955, p.629) distinguish between two types of conformity: informational conformity and normative conformity, and their theory offers an explanation on why people conform. Informational conformity is the 'influence to accept information obtained from another as evidence about reality'. Informational conformity occurs because humans are subject to mutual imitation. People look to others for suggestions on how to behave, especially when the situation that they are in is unclear. On the other hand, normative conformity is 'an influence to conform with the positive expectations of another' (Deutsch and Gerard, 1955, p.629). Normative conformity refers to acting in accordance with others in order to obtain social approval from them and to avoid deviating from group norms. Deutsch and Gerard argue that when considering normative influence on behaviour, it is essential to distinguish between different types of conformity because they affect behaviour in different ways.

Cialdini, Reno and Kallgren (1990, p.1015) draw on Deutsch and Gerard's theory and distinguish between two types of *social norm*: injunctive and descriptive. Descriptive norms are defined as:

> 'what is typical or normal. It is what most people do, and it motivates by providing evidence as to what will likely be effective and adaptive action. If everyone is doing it, it must be a sensible thing to do'.

Descriptive norms refer to what most people do and are 'derived from what other people *do* in any situation' (Cialdini and Trost, 1998, p.155, emphasis original). The concept of descriptive norms is similar to Deutsch and Gerard's (1955) concept of informational conformity described in the previous section. Both terms represent conformity when the concern is to make judgements and decide how to behave.

In contrast to descriptive norms, injunctive norms refer to what people approve or disapprove within a group, society or culture. Cialdini, Reno and Kallgren (1990, p.1015) define injunctive norms as:

> 'The injunctive meaning of norms refers to rules or beliefs as to what constitutes morally approved and disapproved conduct. In contrast to descriptive norms, which specify what is done, injunctive norms specify what ought to be done. That is, rather than simply informing one's actions, these norms enjoin it through the promise of social sanctions.'

Injunctive norms specify what should be done in a situation and influence behaviour by promising social rewards. The concept of injunctive norms is similar to Deutsch and Gerard's (1955) concept of normative conformity as both concepts represent conformity when the concern is to gain social approval.

The concept of injunctive norms is also similar to the concept of subjective norm in the theory of planned behaviour (see section 2.2). The subjective norm is an individual's perception of what important others think should or should not be done. Although both types of norm share the common element of norms influencing behaviour because of the expectations of others' beliefs, in social norms theory there is the underlying assumption that injunctive norms influence behaviour due to the promise of social rewards. In the theory of planned behaviour, the promise of social rewards is not necessary for subjective norms to influence behaviour. However, the concept of injunctive norm may better explain why people conform to norms based on an individual's perception of what should be done; because conformity and defiance leads to a form of social sanction. Moreover, in the theory of planned behaviour the subjective norm is expected to influence behaviour because of the individual's perception of what important others think should be done, but this might not always be clear in particular situations. Therefore, individuals will rely on other information, such as descriptive or injunctive social norms.

People develop perceptions about injunctive norms through experiences of others' reactions to their behaviours (Rimal and Real, 2005). On the other hand, descriptive norms provide information on what is likely to be the correct way to behave in a particular context, especially when people are unsure how to behave in an ambiguous situation. The greater the number of people who behave in the same way in the situation, the more correct an individual will perceive the behaviour (Cialdini and Trost, 1998).

The main distinction between descriptive and injunctive norms is that descriptive norms provide information about what most people do, whilst injunctive norms indicate what ought to be done. Some researchers challenge this distinction between descriptive and injunctive norms because describing what most other people do also introduces injunction (Darley and Latané, 1970; Krebs,

1970; Marini, 1984). However, there is evidence that the two types of norms have separate effects on individual behaviours. For example, Cialdini, Reno and Kallgren (1990) conducted a series of experiments on littering behaviour and their research suggested that different social norms (descriptive norm *or* injunctive norm) influenced behaviour in different ways depending on which norm was made salient in the situation. The authors termed this theory the *focus theory of normative conduct* and they state that descriptive norms and injunctive norms are incongruent in various situations. In situations where one of the two types of norm is clearly salient in an individual's consciousness, it will exert the greater influence on their behaviour.

The focus theory of normative conduct is similar to norm activation theory (Schwartz, 1964) discussed earlier in this chapter. Both theories suggest that increasing the salience of a norm will influence behaviour in a given situation. The difference is that norm activation theory suggests that pro-environmental behaviour is more likely to occur if personal norms are activated, whereas the focus theory of normative conduct primarily states that increasing the salience of social norms can influence pro-environmental behaviour (Cialdini, Reno and Kallgren, 1990). Although the norm activation theory and the focus theory of normative conduct are treated separately in the norms literature, making a norm salient is central to both theories.

Cialdini, Reno and Kallgren's (1990) experiments on littering behaviour support the focus theory of normative conduct. The researchers found that making an injunctive norm salient decreased littering in both a clean and littered environment. However, increasing the salience of a descriptive norm only decreased littering in a clean environment, but when it was made salient in a littered environment, littering significantly *increased.* If the environment was already littered, those who saw another individual drop rubbish were as likely to do so as those in the control condition. Based on their research, Cialdini, Reno and Kallgren argue that an individual's behaviour is likely to be influenced by the social norm that is currently salient in a given situation, even when other types of norms might be relevant or contrary in the situation (e.g. most people littered when they saw another person litter regardless of the generally held belief that one should not litter). The researchers concluded that it is important to examine the impact of both types of norm because their research showed that the power of the two types of norms varies within different environments.

Some social norms research suggests that communicating descriptive norms can influence healthy behaviours (Perkins and Berkowitz, 1986). However, some researchers argue that injunctive norms influence behaviour more than descriptive norms because the latter tend to influence behaviour

only in the immediate situation in which others' behaviour can be observed (Cialdini, Reno and Kallgren, 1990; Smith *et al.* 2012). Research supporting this theory is in the context of health related behaviours (Borsari and Carey, 2003; Helmer *et al.* 2014) and pro-environmental behaviour (Cialdini, Reno and Kallgren, 1990; Kallgren, Reno and Cialdini, 2000). In addition, Smith *et al.'s* (2012) research showed that a conflict between injunctive and descriptive norms led to weaker intentions to engage in pro-environmental behaviour. Despite the shared categorization of *social norms*, the evidence from previous research suggests that descriptive norms and injunctive norms have separate influences on behaviour. Social norms research is discussed in more detail in the next section.

2.4 Social norms approach research

In the last two decades, there has been extensive research on the social norms approach. The approach has frequently been used in interventions to encourage socially desirable behaviours (McAlaney, Hughes and Bewick, 2011). A range of different types of social norms interventions have been implemented, including: social norms approach campaigns, the small groups norms-challenging model and the personalised social norms approach. These different types of social norms approach research are discussed in the subsequent sections, followed by a look at the inadvertent effects of social norms.

2.4.1 Social norms approach campaigns

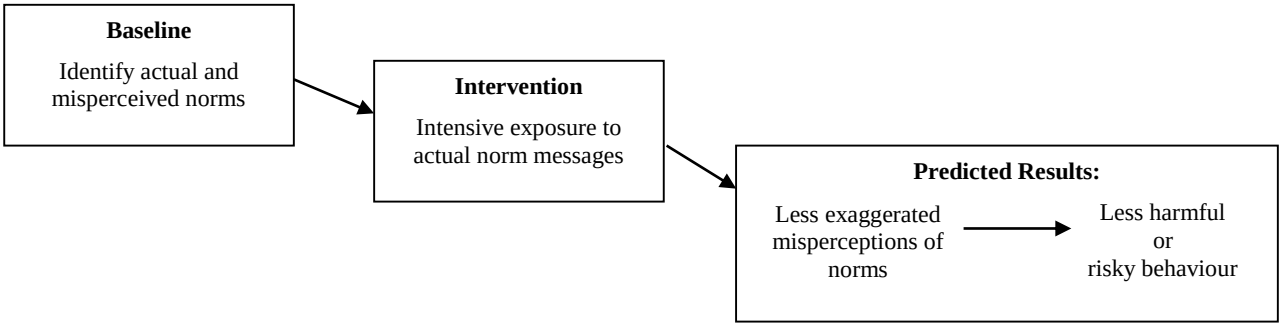
Social norms research focuses on the influence that the perceived attitudes and behaviour of others has on individual attitudes and behaviour. However, research (Perkins and Berkowitz, 1986; McAlaney, Hughes and Bewick, 2011; Helmer *et al.* 2014) suggests that people are often inaccurate in their perceptions and that their own behaviour is influenced more by their inaccurate perceptions of how others think or behave (the perceived norm) than by how others actually think or behave (the actual norm). A misperception occurs when there is an over or underestimation of the prevalence of attitudes and/or behaviours in a group (Berkowitz, 2004). These misperceptions have become the basis of social norms approach campaigns, which are widely used interventions to promote healthy behaviours (McAlaney, Bewick and Bauerle, 2010).

Social norms approach campaigns originated in 1986 from research by Perkins and Berkowitz, who found that college students tended to overestimate the amount and frequency of alcohol consumed by their peers. Subsequent research has similarly shown that students overestimate deleterious behaviours, such as drug use and alcohol consumption, and that this has influenced students to

engage in these behaviours more in an attempt to match what they perceive to be the norm (Haines, Barker and Rice, 2003; Neighbors *et al.* 2008; McAlaney, Hughes and Bewick, 2011).

Social norms approach campaigns seek to correct misperceptions through interventions involving the dissemination of information about the actual social norms within a population (McAlaney, Bewick and Bauerle, 2010). Social norms approach campaigns usually begin by identifying a perception. For example, how much students think alcohol is consumed by their peers on a university campus. The next step involves collecting credible data from a target population about what most people actually do (e.g. how much students actually drink) and then communicating the actual norm through a variety of positive messages. For example: '64% of UA [University of Arizona] students have 4 or fewer drinks when they party' (Thombs *et al.* 2004, p.62). A fundamental element of a social norms approach campaign is to provide this type of social norms message in order to correct misperceived norms within a referent population. This in turn should reduce the occurrence of deleterious behaviours (see figure 2.3).

Figure 2.3 The social norms approach (adapted from Perkins, 2003, p.11)



Earlier social norms approach campaigns tended to use print media techniques to communicate social norm messages to the target audience, such as posters, leaflets, billboards and student news articles (Perkins, 2003). More recent research has included the use of interactive websites and social media (Litt and Stock, 2011; Hummer *et al.* 2013; Kypri *et al.* 2014; Ridout and Campbell, 2014). However, research that integrates social norms feedback with social media is limited and this may be a more effective way to communicate social norms (Ridout and Campbell, 2014).

Social norms approach campaigns have been used to significantly reduce students' misperceptions of peer drinking norms and their drinking behaviours, particularly in American universities (Haines, Barker and Rice, 2003; Perkins and Craig, 2003). For example, Haines, Barker and Rice (2003) reported a reduction in student drinking from 43% to 25% in addition to a decrease in the

misperception of drinking in peers from 70% to 33%. Perkins and Craig's (2003) four-year social norms intervention also produced impressive results. The researchers reported a marked reduction in misperceived norms in personal high-risk drinking and in negative consequences associated with alcohol consumption. For example, alcohol use normally increases during the first year of college, whereas Perkins and Craig reported a decrease in freshman drinking by 21%, a wider decrease in high-risk drinking from 56% to 46%, and a significant reduction in alcohol-related arrests.

Social norms interventions among young adults have also successfully reduced misperceptions of illegal drug use (Hansen and Graham, 1991; Perkins *et al.* 1999) and tobacco smoking (Abhold *et al*. 2001; Hancock and Henry, 2003; Linkenbach and Perkins, 2003). For example, Linkenbach and Perkins (2003) found a 41% decrease in the number of young people who started smoking in the intervention areas compared to the control areas. Misperceptions of peer alcohol consumption and illicit drug use has also been documented in Australia (Hughes *et al.* 2008), Scotland (McAlaney and McMahon, 2007), England (Bewick *et al.* 2008) and in Europe (Pischke *et al*. 2012; Helmer *et al.* 2014). However, there are significantly less social norms interventions that have been conducted outside of America.

Although the social norms approach has generally focused on alcohol, tobacco and drug use amongst student samples, the approach is becoming more widely applied to a range of non-health related behaviours. For instance, the *MOST of us*[1] campaign utilizes the social norms approach on a variety of research projects. *MOST of us* interventions have applied the approach to road safety and parent-child communication through the use of research-based statistics (establishing the social norm) and positive feedback (communicating the socially desirable behaviour of the majority). More recently, the social norms approach has also been used in research on bullying (Perkins, Craig and Perkins, 2011), dietary behaviour (Pelletier, Graham and Laska, 2014) and peer weight norms (Perkins, Perkins and Craig, 2014).

Some social norms interventions have also illustrated the efficacy of social norms feedback in influencing pro-environmental behaviour change. For example, in two separate social norms interventions in which residents of a Californian neighbourhood were provided with social norms feedback about their neighbours' energy consumption, residents significantly reduced their own

[1] http://www.mostofus.org/

energy consumption (Schultz *et al.* 2007; Nolan *et al.* 2007). There is also evidence for the effective use of social norms messages to encourage hotel towel reuse. Goldstein, Cialdini and Griskevicius (2008) found that hotel towel reuse increased by 34% when guests were provided with social norms messages in comparison to those who did not. Schultz, Khazian and Zaleski (2008) reported that in their study, hotel guests who received descriptive social norms feedback (that 75% of hotel guests reused their towels) and injunctive social norms feedback (that most guests approved of energy conservation) significantly reduced the number of towels used, compared with a control condition. More recently, research has shown that social norms can effectively encourage environmentally sustainable transportation behaviour (Kormos, Giffard and Brown, 2015).

Social norms research clearly shows that social norms approach campaigns can sometimes be an effective way to encourage socially desirable behaviours, particularly among American university students. However, some issues with the approach have also been identified. For example, some researchers have failed to find the approach effective (Wechsler *et al.* 2003; Thombs *et al.* 2004; Russell, Clapp and DeJong, 2005). Wechsler *et al.* (2003) evaluated student alcohol consumption at 37 colleges that had employed a social norms approach campaign and found no reduction in alcohol consumption at these colleges. They concluded that their study did not provide evidence to support the effectiveness of social norms approach campaigns in reducing alcohol use among college students. However, Perkins, Haines and Rice (2005) argued that Wechsler *et al*. had not clearly established whether a social norms approach campaign had been conducted at these colleges.

The evidence supporting the effectiveness of social norms approach campaigns in reducing problem behaviours is mixed (for example, see Granfield 2002; Thombs *et al*. 2004; 2007; Russell, Clapp and DeJong, 2005). Thombs *et al*.'s (2004) four-year campaign did not reduce alcohol consumption or perceived drinking norms despite the fact that 66.5% of students were aware of the campaign. A post-campaign analysis indicated that students did not believe the campaign messages and this may explain why the campaign was unsuccessful in changing perceptions.

Granfield (2002) suggests that unsuccessful interventions generally occur when social norms messages are poorly constructed and this decreases their effectiveness. Based on his research, he claims that simple media campaigns may not be the most effective avenue to deliver social norms feedback. Social media may be an effective medium to deliver social norms feedback. Ridout and Campbell's (2014) social norms intervention was the first to examine the feasibility of the social

networking site *Facebook* to deliver social norms messages to reduce alcohol consumption amongst students at a university in Australia. Respondents in their study received social norms feedback via Facebook messages and the researchers found a significant reduction in alcohol consumption in the social norms intervention group compared to a control group. The Facebook messaging service enabled the researchers to ensure that respondents understood the social norms feedback and address any misunderstandings of it. Ridout and Campbell concluded that social networking sites like Facebook can be used to deliver positive social norms messages and has many advantages over traditional social norms delivery. However, there is limited research that has examined the use of Facebook and other social media platforms to conduct a social norms intervention.

Thombs *et al.* (2004) suggest that interactive activities in small groups might help the target audience to better understand the positive approach of social norms approach campaigns. The small groups norms-challenging model uses this approach and is discussed in the next section.

2.4.2 The small groups norms-challenging model

The small groups norms-challenging model focuses on behaviour change in students who are considered to be at high risk for alcohol abuse, such as those in fraternities and sororities (undergraduate social organisations at American universities). The approach follows the traditional stages of a conventional social norms approach campaign, beginning with a survey of student alcohol consumption. However, rather than using media communicative techniques, the small groups norms-challenging model conducts small group workshops, where social norms information is presented and discussed with the participants. Follow-up surveys are then conducted. Far and Miller (2003) claimed that the small groups norms-challenging model has encouraged significant corrections of misperceptions of alcohol use as well as reduced alcohol consumption.

The small groups norms-challenging model is limited, however, as using small group workshops means that only small samples can be included, and therefore it would be difficult to reach a wider audience. Furthermore, using small workshops can be very time consuming and it would not be possible to include all participants in the original survey sample. Although the small groups norms-challenging model approach is an alternative and promising approach to behaviour change using social norms, the research has only focused on health related behaviours. Therefore, more research is required to test its efficacy on other behaviours, such as pro-environmental behaviour.

2.4.3 The personalised social norms approach

Some researchers argue that using a more individualised or personal approach to deliver social norms feedback may increase the efficacy of a campaign (Lewis and Neighbors, 2006). In their review of social norms approach campaigns to reduce alcohol consumption, Moreira, Smith and Foxcroft (2010) argued that interventions using group face-to-face sessions did not appear to reduce alcohol use, but those delivered by individual face-to-face sessions or personally via the internet appeared to be more effective. Research that has used the personalised social norms approach is reviewed in this section.

The personalised social norms approach differs from social norms approach campaigns because it provides feedback on a respondent's own behaviour as well as feedback on others' behaviour (social norms feedback). Lewis and Neighbors (2006) argue that personalised individual feedback may have a greater impact on changing behaviour because it is more salient and explicit in revealing differences among individual behaviour and others' behaviour.

The personalised social norms approach has been used to reduce alcohol consumption amongst college students (Bewick *et al.* 2008; Lojewski, Rotunda, and Arruda, 2010; Neighbors *et al.* 2010) and to encourage pro-environmental behaviour (Schultz *et al*. 2007; Nolan *et al.* 2008; Allcott, 2011; Harries *et al.* 2013b). The personalised social norms approach that has been employed in environmental research generally differs from the research on alcohol because it does not focus on misperceptions of norms, and relies upon actual (rather than reported) behavioural data (Burchell, Rettie and Patel, 2013).

In earlier personalised social norms approach studies, data collection and feedback was generally conducted manually, such as via electricity metre readings (Schultz *et al.* 2007; Nolan *et al*. 2008; Allcott, 2011) and feedback on door hangers (Schultz *et al.* 2007; Nolan *et al.* 2008). More recently, researchers have been employing the use of digital technologies in innovative ways to collect data and provide personalised and social norms feedback (Pischke *et al.* 2012; Ridout and Campbell, 2014). For example, Bewick *et al.* (2008) examined the use of an electronic web-based personalised feedback intervention in which participants received both personalised feedback and social norms feedback on their drinking behaviour. Bewick *et al.* found that those in the intervention group reduced their alcohol consumption more than control group participants who did not receive any feedback. The researchers concluded that delivering personalised and social norms feedback via web-based technologies could be a promising method to reduce alcohol consumption. Despite

Bewick *et al.'s* research including personalised individual feedback and social norms feedback on participant's alcohol consumption, the researchers did not distinguish the influence of the personalised individual feedback from that of the social norms feedback.

In a similar web-based intervention to reduce alcohol consumption and misperceptions, Neighbors *et al.'s* (2011) social norms intervention included personalised individual feedback and social norms feedback. However, like Bewick *et al.* (2008), Neighbors *et al.* provided respondents in the personalised individual feedback group with both types of feedback together. Neighbors *et al.* compared three different conditions: a control condition; a personalised feedback condition (which included both personalised *and* social norms feedback) and a social norms feedback only condition. Compared to a control group, those in the personalised individual feedback and social norms feedback groups decreased their alcohol consumption per week. However, the social norms feedback was more effective than the combination of social norms feedback and personalised individual feedback in decreasing alcohol consumption. Neighbors *et al.* suggested that this may be because the personalised individual feedback combined with the social norms feedback explicitly showed individuals that most other students consumed *more* alcohol than the individual did. Conversely, the social norms feedback communicated that most other students did not consume as much alcohol as individuals thought, and therefore corrected misperceptions as well as indicated that individuals were in the majority. The personalised individual feedback combined with the social norms feedback, on the other hand, indicated that respondents who received this feedback were in the minority in comparison to most students and this may have encouraged an increase in alcohol consumption. This inadvertent effect of social norms feedback has been termed the *boomerang effect* and is discussed later in this chapter. Personalised individual feedback would potentially be more effective if it were provided without the direct comparison to others' behaviour.

Harries *et al.'s* (2013b) CHARM energy study included a comparison of personalised individual and social norms feedback. The study included three groups: a control group; a group that received feedback on their own energy consumption but not the consumption of others; and a group that received feedback on both their own consumption and that of others. Harries *et al.* (2013b) found that although the respondents found the social norms feedback engaging, it did not reduce energy consumption. Harries *et al.'s* research suggests that where personalised individual feedback can be provided, social norms feedback has little additional impact on behaviour change. Research is needed to examine the potential different effects and responses to personalised individual feedback compared to that of social norms feedback.

Most personalised feedback interventions used personalised feedback that consisted of information regarding respondent's own behaviour, perceived norms, and social norms (Borsari and Carey, 2000; Collins, Carey and Sliwinski, 2002; Neighbors, Larimer and Lewis, 2004; Bewick *et al.* 2008; Neighbors *et al.* 2011; Ridout and Campbell, 2014). Although these studies have included personalised individual feedback *and* social norms feedback, the two types of feedback were often presented simultaneously. As Neighbors *et al.'s* (2011) research demonstrates, this can have inadvertent effects on individual behaviour where the undesirable behaviour has been normalised (e.g. most students drink more alcohol than the respondent).

2.4.4 Inadvertent effects of social norms

Although the communication of social norms can be effective in encouraging socially desirable behaviour, it can also be counterproductive. Research indicates that the communication of social norms can have a deleterious effect on the behaviour of those in the target group who are already on the socially desirable side of the norm that is being communicated (Neighbors *et al.* 2011; discussed earlier). For example, in the context of alcohol consumption, news statements such as '22 million in U.S. abuse alcohol' may encourage individuals to drink more because they think most others do (Cialdini *et al*. 2006, p.4). There is a tendency for public officials to try to reduce problem behaviours by depicting it as regrettably frequent, and this inadvertently communicates a counterproductive descriptive norm to the audience (Cialdini *et al.* 2006). Schultz *et al.* (2007, p.429) termed this the 'boomerang effect.' This refers to when the social norms approach increases the socially *un*desirable behaviour of the target audience.

Schultz *et al.'s* (2007) study on decreasing household energy consumption illustrated the boomerang effect. Participants were presented with their individual energy consumption and their neighbourhood's average energy consumption. The researchers predicted that those above the average would decrease their energy consumption after receiving descriptive normative information and those below the average would increase their energy consumption, therefore producing the boomerang effect. The researchers predictions were confirmed as the normative information differentially affected participants' energy consumption depending on whether the recipient was either above or below the norm. Simultaneously, their research indicated that this effect would be avoided if injunctive social norms were evoked through injunctive messages, such as smiley face emoticons. They tested this by providing participants who were below the norm with descriptive normative information plus a smiley face to indicate approval. Consequently, the addition of an injunctive norm discouraged participants from using more energy due to the smiley

face emoticon indicating approval of their low energy consumption. The researchers concluded that injunctive norms can decrease the potential inadvertent effects of descriptive norms.

The focus theory of normative conduct (see section 2.3) is consistent with Schultz *et al.'s* conclusion. For example, Cialdini, Reno and Kallgren's (1990) research on the focus theory of normative conduct showed that increasing the salience of descriptive norms in a littered environment increased littering behaviour because it highlighted the descriptive norm that *most people litter*. However, increasing the salience of injunctive norms against littering decreased littering in both a littered environment *and* a clean environment. Furthermore, Cialdini *et al.'s* (2006, p.8) research on the theft of petrified wood from a national park showed that increasing the salience of injunctive norms messages ('please don't remove the petrified wood from the park' with an image of a person stealing a piece of wood with a red circle and bar over the person) decreased theft significantly more than a descriptive norm message ('many past visitors have removed the petrified wood from the park, changing the state of the Petrified Forest'). Cialdini *et al.* (2006) concluded that their findings were consistent with the focus theory of normative conduct. Their research also highlighted the importance of increasing the salience of injunctive norms rather than descriptive norms in situations characterised by frequent undesirable behaviour.

The research reviewed in this section strongly suggests that both descriptive and injunctive norms can influence people's behaviour so that they may even behave in ways that are not environmentally sustainable (e.g. litter; use more energy; steal precious wood from national parks). However, research has shown that people underestimate how much social norms affect them. It is well established in the literature that others' behaviour can influence individual behaviour, yet people tend to deny the effect of other people's beliefs or actions on their own behaviour (Nolan *et al.* 2008). Sunstein (1996) argues that some people do not like to admit conforming to norms. For example, Sherif's (1936) classic autokinetic effect experiment showed that individuals clearly conformed to others' judgements of how much a light moved, which unknown to respondents, was stationery during the experiment. Sherif found that when tested individually, participants estimated only a small amount of movement. When tested in a group with other participants, individual estimates varied significantly and they converged to the common group estimate. The participants denied that their judgements were influenced by the estimates given be the group members, despite it being clear that they were influenced by the group.

Some people reject, or like to be seen as rejecting, social norms in order to incur disapproval. Nonetheless, those who like to be seen as violating generally held social norms may be conforming to the norms of a particular subculture. For example, some adolescents smoke cigarettes to receive peer group approval whilst violating the generally held norm that people should not smoke. Moreover, those who enjoy violating norms are less likely to admit conforming even if they had adhered to social norms because they want to portray themselves as independent and as non-conformists.

On the other hand, it is possible that people deny conforming because they are not aware of it. The social norms literature indicates that people are often unaware of the extent that social norms affect their own behaviour (Goldstein, Cialdini and Griskevicius, 2008; Nolan *et al.* 2008). This may be because people tend not to recognise why they behave as they do.

Nolan *et al.'s* (2008) study on examining people's reasons for saving energy showed that people usually underestimated the power of social norms on their own behaviour. In their study, respondents were provided with either: a social norms message (that most of their neighbours conserved energy), or a message that stated energy conservation would help the environment, benefit society, or save them money. The study showed that those who received the social norms message changed their energy consumption behaviour more than those who received the other messages. However, interviews with respondents revealed that those who received the social norms message rated it as *least* likely to motivate their energy consumption behaviour. Although respondents rated environmental concerns and social responsibility as the main reasons for conserving energy, neither message influenced a reduction in energy consumption. These findings are in line with literature that suggests that environmental protection messages or appealing to people to do the right thing rarely influences pro-environmental behaviour change (Schultz, 2002; Hobson, 2002; Kollmuss and Agyeman, 2002). This is not to say that environmental protection messages are of no use, because they nevertheless raise people's awareness of the importance of protecting the environment (Lorenzoni, Nicholson-Cole and Whitmarsh, 2007). However, research indicates that environmental protection messages alone are less likely to influence pro-environmental behaviour change and that social norms feedback can potentially be more effective.

2.5 Key features of a social norms intervention

The various forms of social norms interventions have provided some insight into what can potentially improve the success of the social norms approach to encouraging socially desirable

behaviour change (Cialdini *et al.* 2006; Nolan *et al.* 2008). However, the various designs and methods used to examine the effect of social norms feedback also makes it difficult to establish the efficacy of different types of feedback (personalised individual feedback only vs. social norms feedback) and different types of norms (injunctive vs descriptive normative feedback). It is also unclear what medium is most effective for delivering feedback (print media; face-to-face; web-based). Nevertheless, existing research has provided invaluable insight into many different ways of applying the social norms approach and highlighted some key features of an intervention. This section considers these features.

2.5.1 Using descriptive *and* injunctive norms

The majority of social norms approach campaigns have used descriptive norms and some of these campaigns have been successful in changing perceptions and behaviour (Abhold *et al*. 2001; Hancock and Henry, 2003; Haines, Barker and Rice, 2003). However, although social norms interventions are increasingly using descriptive *and* injunctive norms (LaBrie *et al*. 2010; Pischke *et al.* 2012), there are inconsistencies in the findings on the influence of the two types of norm on behaviour change. Some social norms approach campaigns indicate that descriptive norms have greater influence on behaviour change than injunctive norms (Schroeder and Prentice, 1998; Neighbors *et al*. 2008). On the other hand, several studies have found that injunctive norms had a greater impact on behaviour than descriptive norms (Rimal and Real, 2003; Park and Smith, 2007; Phua, 2013). For example, Barnett *et al.* (1996) found that injunctive norms reduced misperceptions of peer alcohol consumption which in turn reduced individual consumption among university students; descriptive norms alone, however, failed to change behaviour. Borsari and Carey (2003) concluded from their review of 23 social norms interventions that injunctive norms were associated with individual drinking behaviour more than descriptive norms. Helmer *et al's.* (2014) research on illicit drug use among European university students indicated that perceived descriptive *and* injunctive norms of peers were significant predictors of individual drug use and approval of drug use.

There may be no resolution to the issue on whether descriptive or injunctive norms can better encourage behaviour change, but one possible solution would be to use both norms in social norms interventions. As several studies indicate, perceptions of descriptive and injunctive norms can influence behaviour (Cialdini, Reno and Kallgren, 1990; Schultz *et al.* 2007; Helmer *et al.* 2014). Moreover, as discussed earlier, research suggests that using descriptive norms alone can have inadvertent effects when the socially undesirable behaviour has been normalised (Cialdini *et al.*

2006), and therefore injunctive norms should be included to counter the possibility of encouraging undesirable behaviour. This may be of particular importance in social norm interventions to influence pro-environmental behaviour because it is likely that *most* people do not engage in several pro-environmental behaviours, and communicating this norm would be counterproductive.

2.5.2 Credibility of social norm messages

As well as social norms messages having inadvertent effects, they can also be discredited and disbelieved, which can consequently hinder the success of a social norms intervention. Lack of success in social norms interventions is attributed to respondents questioning the believability of social norms feedback (Werch *et al.* 2000); respondents not understanding the social norms message due to confusing media images (Russell, Clapp and DeJong, 2005); and unreliable message sources, such as respondents believing that the messages are from university administration rather than credible researchers (Berkowitz, 2004). Granfield (2002) examined why a seven-month social norms intervention was unsuccessful in changing perceptions of alcohol or consumption and found that students disbelieved the social norms messages. Although 85% of the students said that they were aware of the social norms campaign, it did not encourage any change. Granfield (2002) suggested that future social norms interventions should explore why people might reject social norms feedback and the meaning people give to the social norms intervention.

Analysis of people's response to social norms feedback on their behaviours can potentially offer valuable insight into the improvement of social norms interventions. More qualitative social norms research will provide a better understanding on how people respond to social norms feedback and assist in identifying elements of a social norms intervention that may affect its success (Granfield, 2002). Although more recent social norms research has included qualitative methods (Nolan *et al.* 2008; Harries *et al.* 2013b; Elsey, Eccles and Siddiqui, 2013), the body of research has largely been quantitative (McAlaney, Hughes and Bewick, 2011). Future research will benefit from a more detailed and richer exploration of the effects of social norms messages, in addition to other forms of feedback (e.g. personalised individual feedback).

2.5.3 The role of reference groups

The reviewed research indicates that social norms interventions are more effective when the social norms they communicate are perceived as credible by the audience. The research also suggests that people are influenced by the norms of relevant reference groups. A reference group refers to friends, family or relevant others who portray standards that an individual compares and evaluates their

own attitudes and behaviour with (Koger and Du Nann Winter, 2010). The idea that people are influenced by others who are relevant to them is consistent with the subjective norm concept in the theory of planned behaviour (see section 2.2). The subjective norm is an individual's perception of what important others think should or should not be done (Ajzen and Fishbein, 1980). Although they are treated separately in the literature, the role of reference groups in the social norms literature is substantially similar to that of the subjective norm in the theory of planned behaviour. However, where research on the theory of planned behaviour suggests that the subjective norm only exerts little influence on people's intentions, and in turn their behaviour (Armitage and Conner, 2001), extensive evidence on the social norms approach indicates that interventions are more successful when they feature an appropriate reference group (Borsari and Carey, 2003; Lewis and Neighbors, 2006; Neighbors *et al.* 2008; 2010; Helmer *et al.* 2014). Appropriate reference groups are those that an individual can personally identify with, as this increases the likelihood of being influenced by them (Lapinski and Rimal, 2005). The reference groups used in several studies are limited to student populations attending the same university or college, which could be problematic in social norms approach campaigns because people may have closer friendship ties with people who are not students or not part of the university.

Social norms approach campaigns tend to use feedback based on the average student at a particular university, college or school (McAlaney, Bewick and Bauerle, 2010). However, the average student is considered distal; proximal reference groups, such as close friends, gender specific groups or age specific groups, have been found to be more influential in affecting individual behaviour (Neighbors *et al.* 2010; 2011). On the other hand, it is possible that the perceived norm influences reference group selection. For instance, an individual may choose their friends on the basis that they engage in certain behaviours that the individual also would like to engage in, such as drinking alcohol or smoking.

Social norms approach campaigns have generally focused on whether individual behaviour is influenced by the norms of particular reference groups. Despite the evidence that feedback on relevant reference groups can influence individual behaviour, it remains unclear the extent to which individuals personally identify with particular reference groups and how this affects their response to social norms feedback. Moreover, the most influential reference group may not always be the most obvious one (McAlaney, Bewick and Bauerle, 2010). For example, an individual may be more influenced by their friends who they grew up with in their home neighbourhood rather than other students at university. Research is required to determine the ideal reference group for use in social

norms interventions. Using social networks on social media may be an effective way to reach people's relevant reference groups because they are self-defined social groups (e.g. one's *Twitter followers* or *Facebook friends*). Self-defined reference groups may be more influential than those defined by the researcher (Lewis and Neighbors, 2006). For example, the more an individual viewS themselves as part of a particular group, the more influence perceptions of that group's norms should have on the individual. Social identity theory provides an understanding of how identifying with a group influences individual behaviour; this is discussed in the next section.

2.6 Social identity theory

Social identity theory describes how identification with a group influences individual behaviour (Tajfel and Turner, 1986). Social identity refers to the part of an individual's self-image deriving from the social categories to which s/he sees him/herself as belonging. Social identity is derived from social group membership. A social group is a collection of individuals who see themselves as members of the same social category. They share a common definition of themselves and achieve some degree of social consensus about the evaluation of their group and of their membership in it (Tajfel and Turner, 1986).

Social identity theory can be applied to the study of normative influence on behaviour because group members tend to define themselves in terms of a shared social identity and conform to perceived group norms. Some researchers have used a social identity perspective to examine the impact of normative influence on behaviour (Cobb, 2007; Reed *et al.* 2007; Phua, 2013). This body of work suggests that people use their social groups and social networks as sources of normative information and that identifying with a particular group can lead to positive behaviour change (Reed *et al.* 2007; Phua, 2013). This is consistent with social norms approach research, which indicate that people are more likely to be influenced by norms when the norm is related to a relevant reference group (Neighbors *et al.* 2010). Previous research on social norms and social identity has generally focused on health related behaviours (such as smoking or alcohol consumption). More research is required to further examine the impact of social identity, reference groups and social norms on other behaviours, such as pro-environmental behaviour. It would be useful to investigate whether pro-environmental behaviour can be encouraged by providing people with social norms feedback on relevant reference groups that people might personally identify with, such as close friends or social networks.

Literature on environmental behaviour indicates that social groups provide their members with an identification of themselves, and that this can powerfully affect behaviour. For instance, when individuals are part of an environmental group, they are more likely to perceive themselves as environmentalists or *green*, to act in more environmentally friendly ways, and have an integrated concern about the environment (Koger and Du Nann Winter, 2010).

Social identity is to an extent comparative and defines the individual as similar to or different from, or better or worse than members of other groups (Tajfel and Turner, 1986). Group membership encourages stereotypes because people make distinctions between in-groups and out-groups (Tajfel and Turner, 1986). Research has demonstrated that members of particular environmental groups perceived other groups negatively and considered themselves as more environmental than out-groups (Opotow and Brook, 2003). The literature also suggests that stereotypes of out-groups can constrain the adoption of pro-environmental behaviour. For example, it has been argued that barriers to adopting some pro-environmental behaviour is partly associated with the stereotypes of *being green* as 'weird' and hippy' (Lorenzoni, Nicholson-Cole and Whitmarsh, 2007, p.451). Furthermore, research suggests that some people do not identify with environmental groups or want to be seen as being "green" (Hobson, 2001, p.196, emphasis original). People identify with their reference groups and look to these groups for normative information regarding appropriate behaviour in order to 'fit in' with the group, and reject behaviours that they associate with out-groups, such as 'green' groups (Phua, 2013, p.111).

Environmental or 'green' social identities may exist in society, but it is a form of discourse and pattern of meaning-making that has turned it into, for example, 'weird' and 'hippy'. Such terms are socially constructed (Coyle, 2007). These classifications may not exist in other societies, but research suggests that for some people, it is not normal to be 'green' (Hobson, 2001; Lorenzoni, Nicholson-Cole and Whitmarsh, 2007). As this 'green' discourse becomes more widely available and shared, it becomes a social reality and can influence the way people perceive environmentalists and those who partake in particular 'green' activities. The social function of communicating a green discourse may be a way to normalise social knowledge with other in-group members and shows how to deal with green behaviours (Van Dijk, 1990). Simultaneously, the way in which the discourse is communicated must adhere to the usual social norms of that in-group. It is, therefore, important to investigate the discourses that people use when explaining their behaviour change following a social norms intervention because discourses shape the way people interpret environmental issues and may influence their adoption of particular environmental behaviour

(Dryzek, 2005). Discourse analysis can increase our understanding of the principles behind the formation of particular identities and how these may affect consequential behaviours, such as those that impact on the environment. The next section briefly explains the importance of using discourse theory to understand how social norms are constructed, and how it can increase our understanding of pro-environmental behaviour change.

2.7 Social norms and discourse theory

Examining discourses can increase our understanding of social norms and how they influence everyday behaviour. Discourses are normative and socially organised, and they make available particular ways of talking. Discourse is a form of language use, a form of social interaction, and can be interpreted as a communicative event in a social situation (Van Dijk, 1990). Fairclough (1989) holds that language is a social practice and a socially conditioned process. Therefore, the language that we use and our understandings of it is due to the society we are a part of. Language is not simply an expression of social processes and everyday practices; it is a part of them. Language is determined socially and has social effects (Fairclough, 1989). Discourse analysis is the study of language and how it is used by people to do things. The analysis of discourses emphasises how social reality is linguistically constructed and can provide an insight into social life and social interaction (Potter and Wetherell, 1987). It is important to analyse the discourses people use to understand how established social norms in society may influence their subsequent everyday behaviour, such as environmental behaviour. Discourse analysis is a way of learning and understanding how consequential aspects of social life and everyday behaviours are done.

People collectively draw upon discourses to organise their behaviour and conduct. Discourses are used as a means to legitimise existing everyday behaviours simply through the reoccurrence of ordinary and familiar ways of behaving. We rely on common-sense assumptions to go about our everyday lives and these assumptions are embedded in taken-for-granted social norms and underlying conventions of discourse (Fairclough, 1989). There are regular and conventional ways of doing things (social norms) which guide people and order discourse. It is, therefore, important to analyse social norms as discursive, because doing everyday behaviours is doing discourse (Wetherell, Taylor and Yates, 2007). Discourse analysis enables the analyst to consider what people do in discourse. One of the aims of this research was to identify the everyday behaviours people do, the normative and conventional aspects of them, and the implications of them on the environment. Identifying and examining the discourses that respondents' used to explain their

environmental behaviours provided an insight into the taken-for-granted conceptions that underlie normal everyday behaviours that impact on the environment and their susceptibility to change.

Previous research shows the existence of environmental discourses (Dryzek, 2005; Hobson and Niemeyer, 2011) and social norms about environmental behaviour (Cialdini, Reno and Kallgren, 1990; Kinzig *et al.* 2013) that guide people's everyday behaviours. In the current research, the iGreen intervention and the qualitative interviews were discursive events set up by the researcher, which may have introduced discourses about social norms and environmental behaviour. Nevertheless, it is likely that these discourses existed prior to the study and were drawn upon by the respondents to justify and explain their behaviour. Identifying and analysing the discourses respondents use in their talk concerning the iGreen intervention and their everyday behaviours that impact on the environment can increase our understanding of the established, underlying social norms that influence their behaviours. Rather than simply looking at whether respondents' behaviour did or did not change, this research also focused on the construction of their explanations for changing, or not changing, their environmental behaviours and how social realities and identities regarding environmental behaviour are formed, and the consequences of these on respondents' behaviour change.

The role of discourse has largely been ignored by several previous social psychology researchers (Van Dijk, 1990), such as those discussed earlier in this chapter (e.g. Schwartz, 1970; Ajzen, 1991; Stern, 2000). Potter and Wiggins (2007) argue that some social psychology researchers tend to separate talk and action (such as the attitude and behaviour distinction in the theory of planned behaviour, see section 2.2 of this chapter) and this overlooks the ways in which language itself achieves many aspects of social life. As Potter and Wiggins (2007, p.77) state, 'discourse is the primary medium for social action'. For example, use of language enables us to achieve many aims, such as justify, explain, blame, defend and persuade, and this is achieved through a variety of rhetorical devices and strategies (Coyle, 2007). In discourse analysis, it is assumed that people select from a range of linguistic resources and use these resources to construct a version of events, although this is not necessarily intentional. Analysing the language people use enables the researcher to examine how they use it to construct versions of their everyday life and behaviours and what is gained from these constructions (Coyle, 2007).

This thesis looks at two forms of functions of discourse; firstly, behaviour that impacts on the environment, and secondly, discursive actions that seek to influence others (e.g. the presentation of

self in an interview). There does not seem to be any social norms approach research that has used a discourse analysis approach to interpret the findings. The author of this thesis agrees with Van Dijk's (1990) argument that sophisticated analysis of the many properties of text and talk may yield insight into the social functions of discourse and interaction. This research focused on the ways in which respondents' accounts were constructed to perform particular functions in the interview. The research looked at how discourses were constructed, and were constructive of different versions of accounts, and how they were tied to actions (Potter and Wiggins, 2007). This detailed analysis of respondents' talk provided an insight into the meanings that underlie their behaviour change, and into the social norms and conventions that may or may not prompt them to behave in pro-environmental ways. This provides an innovative interpretation of the social norms approach to encourage pro-environmental behaviour.

2.8 Chapter summary

This chapter showed that determining what influences behaviour is complex. It was argued that theories that focus on attitudes and values present a rational perspective of behaviour and the chapter highlighted the importance of social and personal norms on behaviour change. This chapter has shown that the social norms approach has the potential to encourage socially desirable behaviour change, but only if the social norms intervention is implemented carefully with a number of key features in place.

The cumulative findings from social norms interventions reviewed in this chapter indicated that social norms can have a powerful effect on encouraging pro-environmental behaviour. Evidence supporting the use of the social norms approach and personalised feedback continues to expand, but it remains unclear how individuals respond and react to personalised individual feedback *and* social norms feedback on their environmental behaviours. There is a paucity of research that has compared the efficacy of different types of feedback to encourage pro-environmental behaviour.

Although research suggests that social norms associated with relevant reference groups that individuals identify with effects their behaviour, much of the research has focused on reducing substance use amongst students and their peers. Further research is needed to examine the impact of social norms feedback associated with particular reference groups that people identify with on pro-environmental behaviour change, and how social identity may play a role in encouraging the adoption of pro-environmental behaviours.

Previous research has largely used quantitative methods to examine the efficacy of social norms interventions. The literature on social norms, and other normative influences, has yet to consider the response to different types of normative feedback on people's behaviour in great depth, which may facilitate the implementation of a more informed and successful intervention. The literature also suggests that although interactive websites and social media can be an effective method to deliver feedback, research that has examined this is limited. Therefore, this study explored if a social norms intervention, which included the use of a Facebook app to deliver feedback, could encourage pro-environmental behaviour. This research examined if there were any differences between three feedback groups (no feedback; personalised individual feedback; and social norms feedback) behaviour change as a result of the intervention. A qualitative approach was used to explore how participants responded to the two different types of feedback and how they reacted to the particular reference group used; other Facebook users. Using elements of a discourse analysis approach to analyse the interviews enabled an in-depth understanding of *why* a social norms intervention encouraged pro-environmental behaviour and *how* people responded to feedback. The next chapter presents the research design, data collection and analysis methods that were employed to address these questions.

3.0 Methodology

This research was influenced by the social norms approach (see chapter two) and explored the efficacy of it to encourage pro-environmental behaviour. The research included three groups as in the other CHARM studies (see chapter one) to compare personalised individual feedback with no feedback (the control) and a combination of personalised individual and social norms feedback. This approach differed from most previous social norms research because it involved a comparison of two types of feedback (personalised individual feedback and social norms feedback), and evaluation included in-depth analysis of qualitative research as well as the analysis of quantitative data.

This chapter describes and provides a rationale for the methodology employed in this study. A combination of quizzes, questionnaires and qualitative in-depth guided interviews were used to take this study forward. Combining methods is often referred to as 'mixed methods research' (Teddlie and Tashakkori, 2003, p.10). A mixed methods approach was employed because it best served the aims of this study. Thus, the research aims guided the selection of methods. One of the aims of this research was to explore the efficacy of a social norms intervention to encourage pro-environmental behaviour. The intervention was used to conduct an experiment using the social norms approach through a Facebook app called iGreen. A post-intervention questionnaire enabled the collection of data concerning participants' experience of iGreen and demographical data. Qualitative interviews were then conducted. This had two aims. The first was to find out how participants constructed and recounted their experience of the iGreen intervention. The second was to identify the discourses participants used when explaining their experience of: using iGreen, any changes in behaviour, and response to feedback, and then to consider the implications of these discourses. Therefore, it was necessary to use unrestricted methods that allowed participants to speak openly about their experience of using iGreen. The key method employed in this thesis was the recording and qualitative analysis of in-depth guided interviews with open-ended questions.

The remainder of this chapter describes in detail the methods just outlined. The first section (3.1) provides an explanation of the design and implementation of the social norms intervention employed in this study. Section 3.2 describes the qualitative in-depth interviews. These sections also describe the sample for the intervention and the interviews. Strengths and limitations of the methods are also discussed in each section. Section 3.3 presents the ethical issues with details of how these were addressed. The final sections discuss the data analysis strategies that were employed to analyse the quantitative data and the qualitative data.

3.1 Research design

This section focuses on the research design of the social norms intervention. Central to the intervention was an innovative Facebook app called iGreen, which was designed by the researcher, the CHARM team and a Facebook app developer. iGreen comprised environmentally themed games, a quiz on aspects of everyday domestic behaviours that impact on the environment, and the ability to provide feedback on participants' previous quiz answers. Users of the iGreen app were asked to complete the same short quiz on seven occasions, and every time they completed the quiz, the app provided access to a new game and entered the user into a prize draw. To gain access to a new game and be entered into a prize draw, the user had to return to the app in seven days and complete the quiz again until all seven quizzes were complete. The purpose of the time delay was to see if users' quiz answers changed over time. The games and prize draws were incentives to encourage users to return to the app. Once all quizzes were complete and all games unlocked, users were entered into a final prize draw and asked to complete a post-intervention questionnaire. Those who downloaded the app were randomly assigned to one of three versions of the app: one that showed the participant's previous answer once they had answered a question; one that also showed the average response as well as the participant's previous answer, and a control version that provided no feedback. These elements of the app are described in detail in the following sections.

3.1.1 iGreen quiz

The aim of the iGreen app was to get people to complete the same quiz seven times over a period of at least seven weeks and to see whether this influenced their behaviour. Extensive research shows that questioning people on future behaviours can influence the performance of those behaviours (Sherman, 1980; Sprott *et al.* 2006; Wood *et al.* 2014). Research indicates that people over-predict socially desirable behaviours and subsequently behave in accordance with those predictions (Sherman, 1980). Research using a question-answering process to encourage behaviour change in the social norms field has been overlooked. The current study investigated how questioning respondents about *past behaviours* may influence their subsequent behaviour. The iGreen quiz questions addressed the previous week's behaviour within a common pro-environmental discourse (e.g. *Last week, how often did you leave on the tap whilst cleaning your teeth?*). The quiz was carefully designed not to include leading questions. Rather than including questions on what people 'do for the environment', which may have led people to assume that they *should be* doing things for the environment, they were on everyday behaviours that people do and generally known to have an impact on the environment. For example, the quiz questions covered topics such as whether people turned off taps whilst washing the dishes, switched off the television rather than left it on

standby and how often they took their own bags to the supermarket (see appendix A for the list of quiz questions).

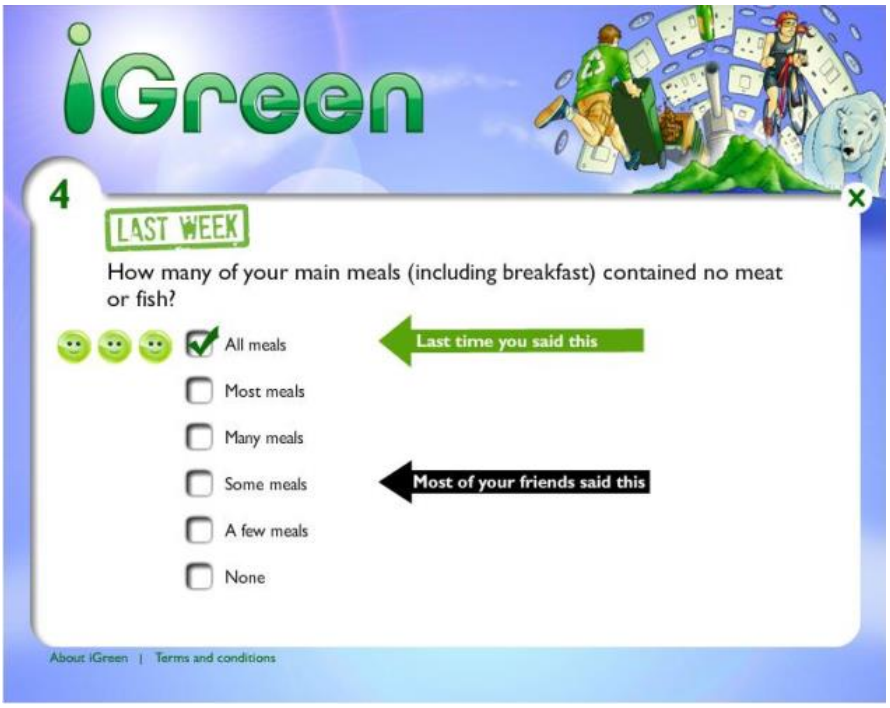
The quiz had an ordered set of closed-ended response items (ordinal variables). Ordinal level variables are often used for Likert type scales and the quiz question responses ranged from 'always' to 'never'. Some researchers suggest that between five and seven response categories is ideal as there is no middle response, and therefore encourages respondents to make a clear choice (Miller, 1956; Molenaar, 1982; Foddy, 1993). Taking this into consideration, six response categories were included in the quiz. The disadvantage of using this type of scale is that respondents may select the most favourable response for each question (Campbell and Fiske, 1959): for instance, because the questions are related to pro-environmental behaviour, respondents may assume that they should select what they perceive to be the most environmentally sustainable response. Therefore, the context of the questions might invoke a social desirability bias (Edwards, 1957; Crowne and Marlowe, 1960). Social desirability bias poses a problem when conducting research with self-reports, particularly questionnaires and interviews because respondents may over report desirable behaviour (Corral-Verdugo, 1997). To discourage this, the first quiz answer was not always the most favourable response and answers were reverse scored.

3.1.2 The three intervention groups

iGreen users were randomly allocated by the iGreen app to either a no feedback, personalised individual feedback only, or social norms feedback group. Each time users answered a quiz question, those in the two feedback versions were shown their previous answers. Those in the social norms version were also shown the average answer of other respondents and, if they were 'better' than the norm, were shown up to three 'smiley' emoticons to discourage regression to the norm (Schultz *et al.* 2007). As discussed in chapter two, previous research suggests that social norms messages can increase socially *un*desirable behaviour; termed the boomerang effect (Schultz *et al.* 2007). Research suggests that this effect can be avoided if injunctive social norms are evoked through the provision of injunctive messages, such as smiley face emoticons (Cialdini, Reno and Kallgren, 1990; Cialdini *et al.* 2006; Schultz *et al.* 2007). Hence the inclusion of smiley face emoticons in the iGreen app (illustrated in figure 3.2). If the respondent's answer was one better than the average answer they would receive one smiley face, if their answer was two better they received two smileys, and three was the maximum they would receive. The quiz screens and feedback are illustrated in Figures 3.1 and 3.2.

Figure 3.1 Personalised individual feedback

Figure 3.2 Social norms feedback



As illustrated in the figures, the personalised individual feedback was presented in a large green arrow and the social norms feedback was presented in a black arrow. The feedback remained on

the screen for approximately four seconds before the next question appeared. During the testing and piloting stage, this seemed an adequate amount of time for respondents to read the information. Respondents could not go back to see their answers or change them. Once they had completed all the quizzes, respondents were asked to complete a post-intervention questionnaire (see appendix B). The purpose of the questionnaire was to gain demographic information about respondents as well as information on their experience of using the app. The questionnaire was taken online and accessed via a hyperlink in the iGreen app.

3.1.3 The iGreen games and prizes

Completion of each of the seven quizzes was incentivised by the promise of access to a new game and entry into a number of prize draws[1]. The games were all related to an environmental issue, such as recycling, pollution and energy consumption (see appendix C for more details). Previous gamification research indicates the potential of using online gaming to encourage pro-environmental behaviour change (Bang, Torstensson and Katzeff, 2006); although this was not the intention of the current study, it was noted that the iGreen games may have an impact on respondents' behaviour and this was explored in the post-intervention questionnaire and the interviews.

[1] The prizes included: iPod Shuffles, iPod Nanos, iPod Touch and the final prize draw was to win an iPad.

Figure 3.3: iGreen game page

Figure 3.3 shows the main 'home' screen from where the quiz and games could be accessed. When iGreen was first downloaded, all games except for one were locked. The first game was open (unlocked) from the beginning, to give new users an impression of the remaining six games. After users played the first game, they were prompted to complete the first quiz in order to unlock the second game (illustrated in figure 3.3, where the game icon *cycle city* is shown as unlocked). To unlock the third game (*spin flip*), however, the user needed to return to the app after seven days and take the quiz again which unlocked a new game. This process was to be repeated until all of the games had been unlocked. The purpose of the seven-day time delay was to see if respondents' answers changed over time. Completion of each of the quizzes and the post-intervention questionnaire was incentivised by entry into a number of prize draws.

All iGreen users' data was entered and stored in a database that was linked to the app. Each time iGreen was downloaded, information from the app was entered into this database, including the user's name, date of birth and group allocation. Every time respondents' completed a quiz, their quiz answers went into the database. The post-intervention questionnaire responses were also stored in a database. The data was then transferred into statistical software packages (Microsoft Excel and SPSS) for analysis. The Facebook app developer implemented iGreen and the database in eight

months, during which the researcher tested all aspects of the app. The app and database were then used as part of a pilot study.

3.1.4 Pilot study

A pilot study of the data collection process was conducted before the app could be accessed online by the public. This was to ensure the process was effective and to detect any problems with the method before the actual study commenced. Twenty people were given access to iGreen and asked to use it for six weeks. Once ten of the twenty respondents had completed all six quizzes they were interviewed. The pilot study provided valuable information regarding the technical aspects of the social norms intervention, such as how long the feedback should be presented, if the font size and text on the quiz were legible, as well as assisting the researcher in designing the interview guide (see section 3.3).

A number of issues were raised concerning technical elements of the app and the database. During the testing stage, the researcher noticed an issue with the social norms feedback. The number of people that the feedback was based on was the same for every respondent, which indicated that the feedback did not relate to each respondent's friendship group as planned by the researcher and CHARM team. This was a technical error that could not be resolved by the Facebook app developer, and therefore respondents in the social norms group received feedback based on the *entire sample*, rather than their own friendship group. This meant that the social norms feedback was not based on an appropriate reference group (people's own Facebook friends), but other users of the iGreen app. It was important to note that this could have affected the impact of the social norms feedback (discussed in chapters six and seven).

3.1.5 Recruitment

To encourage people to download the app, recruitment strategies were used. iGreen was advertised on the Kingston University website, via emails to students and members of the CHARM team advertised at their universities via emails to their students. This limited the sample to university students, and therefore other strategies were required to raise awareness of iGreen to a wider demographic. For example, emails were sent to group listings on a number of social network sites,

including Facebook and Linked In[1] and a national academic mailing list service called JISCMail[2], which enables users to send emails to academics that are part of various groups. Using the JISCMail service, emails were sent to environmental groups, social media research groups and gaming groups. These groups were selected because they seemed most relevant to this research and would potentially be interested in iGreen.

To widen the research population, a Facebook advert was also used. However, Facebook selects which adverts appear on user's pages in relation to the user's profile. For example, if a user was already a member of an environmental group they were more likely to see the iGreen adverts appear on their Facebook page. This should be noted when reading the findings because respondents may have existing concerns for the environment, and potentially more susceptible to change their behaviour in more environmental ways. This was explored further during the qualitative interviews.

When people downloaded the app, they were informed that they might be invited for an interview. However, they were only contacted if they confirmed they were interested in being interviewed via a tick box and provided an email address. To encourage people to participate in the interviews they were offered an incentive of £30.

3.1.6 Participants

Anyone aged over 18 was invited to download the iGreen app and over 2,800 people did so. Of these, 51 completed all seven rounds of the quiz and 44 also completed the post-intervention questionnaire. The low completion rate may have been due to a drawback of the method, as some interviewees stated that the repetitive quiz became boring and some of the games were not fun. Most respondents dropped out after the first or second week, which may have been due to the process of completing the quizzes to access the games and/or the prize draw being unappealing, they may not have enjoyed playing the first game and therefore did not return to the app to try the rest, or they simple preferred other Facebook apps as new apps emerge frequently. Nonetheless, 51 respondents completed all quizzes and interviews with some of them suggested that the games and prizes incentivised them to return to the app. Their demographics are discussed below.

[1] http://www.linkedin.com/home
[2] http://www.jiscmail.ac.uk/

Respondents' age, gender and the intervention group they were allocated were the only demographics that could be entered into the database upon download of iGreen because of the technical capabilities of the app. The post-intervention questionnaire was used to collect other demographic information from respondents (see tables 3.1 – 3.4). Therefore, detailed demographical data could only be obtained from those who completed all of the quizzes *and* the post-intervention questionnaire; not from all participants who downloaded iGreen. The details of eight respondents who completed the quizzes could not be included in the analysis because although they completed the quizzes, they did not complete the post-intervention questionnaire.

Table 3.1 iGreen respondents' demographics (%)

	Age	Full-time employed	Full-time student	Part-time employed	Unemployed
Users who completed all quizzes & post-intervention questionnaire N= 44	25 - 34	41	27	14	9

Table 3.2 iGreen respondents' ethnicity (%)

	Ethnicity: White British	Ethnicity: White other	Ethnicity: Other	Ethnicity: Black British	Ethnicity: Mixed background	Ethnicity: Black Caribbean
Users who completed all quizzes & post-intervention questionnaire N= 44	50	18	15	7	7	3

Table 3.3 iGreen respondents' gender (%)

	Female	Male
Users who completed all quizzes & post-intervention questionnaire N= 44	49	51
Users who downloaded iGreen N= 2844	47	53

Table 3.4 iGreen respondents' group allocation (%)

	No Feedback	Individual Feedback	Social Norms Feedback
Users who completed all quizzes & post-intervention questionnaire N= 44	32	35	33
Users who downloaded iGreen N= 2844	33	33	34

Most (55%) respondents were in paid employment and aged 25 – 34, and 50% of those who completed all the quizzes and completed the questionnaire selected White British in response to the ethnicity question. There was no evidence of gender (table 3.3) affecting downloads or continued

usage of the app. There were no apparent differences between the three groups (table 3.4) amongst those who completed the process and non-completers.

All quantitative data was collected via the iGreen app so that participants could answer the screening questions (see section 3.3), participate in the intervention, and complete the post-intervention questionnaire whenever they chose to. The post-intervention questionnaire contained a question on whether respondents would be interested in participating in interviews about iGreen.

3.2 Qualitative interviews

Qualitative interviews allow access to peoples' attitudes, interpretations of events, understandings and experiences. The aims of this study were to explore participant's experience of the iGreen intervention, to gain an understanding of how participants responded to feedback on their environmental behaviours, and to examine any differences between discourses used by members of the three groups (no feedback; personalised individual feedback; social norms feedback) when discussing how iGreen had affected their behaviour. Therefore, qualitative interviews were thought to be an appropriate way of addressing these questions.

One of the aims of this study was to ascertain if the social norms intervention encouraged any behaviour change. To avoid leading the participant towards discussing their behaviour change, which if prompted may have encouraged social desirability effects, the researcher initially asked the general question 'what did you think of iGreen?' This often prompted most participants to spontaneously discuss their behaviour change.

Another aim of this study was to explore how participants responded to the personalised individual feedback and the social norms feedback. Most participants discussed the feedback without being prompted, but those who were less forthcoming were asked if they had received any feedback and this encouraged them to discuss it. Participants were then asked open-ended questions to encourage a more detailed discussion about their response to the two types of feedback. The researcher tried to remain neutral when asking questions in an attempt not to lead participants or show judgment.

The interviewing style was also influenced by the researcher's intended data analysis methods. As discourse analysis was the chosen method for analysing the interviews, an interventionist interview style was appropriate. Potter and Wetherell (1987) recommend an interventionist approach, this is where the researcher makes the interview challenging for the interviewee by providing

opportunities for them to make a detailed account. The researcher did this by responding to interviewees in a way that allowed them to consider alternatives or even contradict themselves to produce the fullest account.

Research materials used during the interviews included the quiz questions, participants' post-intervention questionnaire data, and their quiz answers over the seven weeks presented in a graph (see appendix E for example). This graph was presented because most participants were interested in seeing their answers for the seven quizzes. Also, it was useful to compare what they said during the interview with the answers they had given in the quiz. This was of particular interest when the graph suggested that participants had not changed their answers, but in the interview participants claimed they had changed them. This elicited discussions about these inconsistencies. The researcher went through the quiz questions at the end of the interview to explore how participants answered each question and what participant's thought they had answered for each question. All materials were shown at the end of the interview because presentation of materials earlier may have influenced the participant to give a different account.

The interviews took place in different parts of England, predominantly in participants' homes because this was convenient and comfortable for respondents (Byrne, 2012). Most interviews lasted ninety minutes. Interviews were usually transcribed immediately so that the researcher could reflect on the interview technique and to identify any interesting themes for exploration in future interviews.

3.2.1 The quality of qualitative interviews

The quality of qualitative research is controversial, where concepts of validity and reliability are often seen as inapplicable or irrelevant to qualitative data (see Seale, 1999 for a comprehensive discussion). However, some researchers (LeCompte and Goetz, 1982; Lincoln and Guba, 1985; Kirk and Miller, 1986) find alternative ways of assimilating validity and reliability into their research, which the current research also aimed to do.

Where quantitative validity and reliability checks may be inappropriate for qualitative research, Lincoln and Guba (1985) propose that the qualitative researcher should aim to demonstrate that their research is credible. This is the truth value of the findings and interpretations of qualitative data, and Lincoln and Guba suggest that credibility can be established by using various techniques. These techniques were attempted in the current study and are explained in the following sections.

Building trust with participants is one possible way to increase the probability that credible data will be produced. The researcher attempted to build trust by building a rapport with interviewees. At the beginning of the interview, the researcher asked participants informal general questions unrelated to the research in an attempt to get to know them and encourage them to speak openly. Informing participants that their identity would remain anonymous throughout and after the study, stating that there was no correct answer and what they say would not be judged also seemed to encourage them to speak openly. This may have encouraged more credible responses. For example, participants tended to explicitly recount that they had not changed all of their behaviours, and this indicates that they did not simply say 'normatively appropriate things' in order to please the interviewer (Lincoln and Guba, 1985, p.302).

Demonstrating that the findings have a 'degree of neutrality' further contributes to the credibility of the findings (Lincoln and Guba, 1985, p.290). This is the extent that the data is generated without interference from interviewer bias or leading questions. For this reason, the researcher aimed to establish neutrality during interviews by asking open-ended questions, allowing respondents to lead discussions and maintaining objectivity throughout the interview.

Qualitative interviews provide in-depth information that would not have been found in a quantitative survey (Byrne, 2012). An exploratory approach can establish new meanings and understandings about the social phenomena being researched. The quality of qualitative research, therefore, is concerned with originality and discovery rather than generalisation. This thesis took on an exploratory approach which aimed to contribute to literature, rather than generalise.

3.2.2 Interview sample size

There are no rules for the required sample size in qualitative research. Instead, sampling should provide an adequate amount of data to assist in answering the research questions. The chosen method of data collection and analysis should also be considered when determining sample size (Patton, 2002). This study included qualitative in-depth interviews with open-ended questions and discourse analysis to analyse the interviews and these are both labour intensive and time consuming. Additionally, the aim was to interview participants who had completed all iGreen quizzes and an adequate amount of people from each intervention group in order to compare data across the three conditions. Ten participants from each group seemed appropriate to gain a rich understanding of participants' experiences from the different groups' perspectives of the

intervention. Thirty participants in total were manageable to conduct ninety-minute interviews, transcribe them, and the intensive analytical methods employed.

3.3 Research ethics

Ethical approval for the study was granted by Kingston University's Business and Law Faculty joint ethics committee. The research followed the ethical guidelines established by Kingston University.

As this study included an intervention to encourage behaviour change, there were potential ethical issues. Respondents were expected to alter claimed, and possibly actual, behaviours in a pro-environmental way (e.g. recycle more, use less electricity, use less water) in response to the personalised individual feedback and the social norms feedback provided by the iGreen app. Consequences could conceivably be that they changed their behaviour in some adverse way. This was very unlikely as the quiz questions covered everyday domestic behaviours that were not harmful or dangerous, such as how often respondents turned off taps, turned off appliances such as the television or mobile phone chargers, and how often they used public transport. Furthermore, the app did not tell respondents what they *should do*, and they were not advised or informed how they should behave. The feedback simply informed respondents about what they had answered in the previous quiz and/or what most other iGreen users had answered.

Respondents were informed about the purpose, methods and intended use of the research as part of the CHARM project and this PhD thesis. When respondents downloaded iGreen, terms and conditions (appendix F) were displayed informing them that they would be participating in a research study by downloading the app. All users' dates of birth (as entered on Facebook) were screened by the app to check that they were over 18. Respondents' agreement to the terms and conditions provided their informed consent to participate in the trial of the social norms intervention. Respondents were also informed before downloading the app that their scores would be included in a calculated average and shown to their friends and other users who have adopted the app. They were informed that their quiz scores would be included in the study and would be completely anonymous and remain entirely confidential throughout and after the study. The app also notified respondents that they might be sent a message to see whether they were interested in being paid to take part in an interview. Respondents had the option to discontinue using the app at any time and if they had any questions regarding the app or research, they were given the opportunity to contact the researcher through the app's messaging service. Quiz and questionnaire

records were made anonymous by using identification numbers rather than names for each respondent.

Interview participants were contacted via emails that requested their participation for an interview. If they agreed, at the beginning of the interviews participants were given information sheets and consent forms to read and sign (appendix G). They were informed that they could stop at any time and did not have to discuss anything they did not feel comfortable about. In this thesis, participants' names have been replaced with pseudonyms and any persons the participants referred to or names used during interviews are also pseudonyms. Participants were also given the opportunity to read their interview transcripts (though none asked to). To protect their anonymity, participants' data was handled carefully by transferring all interview recordings to the researcher's personal computer and securely stored with password-protected access.

3.4 Analysis

In line with the methodologically eclectic nature of this study, a range of analytical approaches were used for the different types of data collected. This included statistical analysis of the quiz and questionnaire data; thematic analysis; and elements of a discourse analysis.

Although the main form of analysis informing this study was qualitative, statistical analysis of the quiz data was conducted. The quantitative and qualitative analyses in this study were treated as complementary. Any inconsistencies between the results of the two methods were particularly interesting because they prompted reflexivity about the findings (Gaskell, 2000). The quiz data was analysed to identify any changes in respondents' quiz answers during the seven week intervention; the interviews were then analysed to see if respondents' behaviour changes suggested in the quizzes were consistent with these. Analysis of the interviews provided a better understanding of respondents' behaviour change and explanations for their behaviour. Although some quantitative analysis was carried out, it should be taken into account that generalisation is not suggested here (and is not the intention of this study).

3.4.1 Quiz and questionnaire data analysis

The quiz data was analysed to gain an indication of any changes in respondents' answers during the seven week intervention and differences between the three groups answers (no feedback, personalised individual feedback and social norms feedback). Quiz data for respondents who did

not complete all seven quizzes were excluded, leaving fifty-one respondents in the sample. All analyses were performed on the quiz and questionnaire data using statistical software SPSS.

Non-parametric techniques were used as they are ideal for analysing data that is measured on ordinal scales, when there are no confidence intervals and fewer assumptions about the data (Siegel and Castellan, Jr., 1988; Cramer and Bryman, 1997; Pallant, 2013). The researcher wanted to compare the quiz answers from week one to week seven for any significant changes in them for the entire sample (N= 51). The Friedman test was used because it allowed for analysis on repeated scores, and enabled the detection of changes in respondents' quiz answers across the seven weeks. The test ranked the scores on the quiz answers for each respondent separately, and calculated the mean of these rank scores for each answer. If there were no changes between the sets of quiz answers from week one to week seven, the rank totals would be more or less the same (Foster, 1998). The test also produced the Chi-square value (χ^2), the degrees of freedom (df) and the level of statistical significance (p) of the change in respondents' quiz answers. The change was considered significant if p was below 0.05.

The Kruskal-Wallis test was used to analyse any differences between the three intervention groups' answers given in the seven quizzes. The Kruskal-Wallis test allows a comparison of the effects of repeated measures between groups. Like the Friedman test, the Kruskal-Wallis test produces the Chi-square value (χ^2), the degrees of freedom (df) and the level of significance (p). If the significance level was less than 0.05, this suggested that there was a statistically significant difference between the answers to a particular quiz question across the three groups. If a significant difference between the groups' quiz answers had been found, post hoc tests would have determined where those differences lay (e.g. between the no feedback condition and the social norms feedback condition).

Averages and frequencies for post-intervention questionnaire data were also calculated using SPSS descriptive statistics for the data on demographics (see section 3.1.6) and questions regarding the response to the intervention.

3.4.2 Analysis of interview data

Within this study, the collection and analysis of interview data was an iterative process. Early analysis helped to inform data collection and was treated as part of the research design (Coffey and Atkinson, 1996). After each interview, the researcher wrote detailed notes and this helped to reflect

on the interview questions for future interviews. Interviews needed to begin as soon as respondents completed the seven quizzes and post-intervention questionnaire so that their recall of using iGreen was not too demanding.

The researcher used a simplified transcription system originally developed by Jefferson (1985), which assisted in writing detailed and more accurate transcripts that included pauses, overlaps and emphasis of speech. During transcription, notes were made on emerging themes, key segments were highlighted and codes were inserted. This process was useful in making links to subsequent data. All transcripts were checked against the audio recording. This usually resulted in adding more detail that was missed and the recordings were listened to again during analysis. This time-consuming process enabled the researcher to become intensely familiar with the data and begin analysis early as key themes were identified (Rapley, 2004).

Generating codes and themes

Codes emerged from the data and data was coded and analysed as it was collected. Transcripts were coded line by line using the computer assisted qualitative data analysis software Atlas.ti. Using Atlas.ti allowed efficient access to raw data, made it easier to verify or falsify developing theories and modify codes when necessary as new data was collected (Friese, 2012). It also facilitated the development of more refined codes. Coding in Atlas.ti enabled the researcher to produce code lists and cross check them against relevant segments of data to ensure they were accurately coded as well as find negative instances that contradicted or helped develop emerging theories (Seale, 2012).

Once all transcripts had been coded, the codes were categorised along with any relevant data from the quiz and questionnaire, and grouped around each research question in order to contribute to answering them. This produced a number of themes, and these themes were analysed across all transcripts to identify patterns. This approach allowed the researcher to compare and contrast themes and to explore regular patterns across all respondents, patterns relevant to only a few respondents and those specifically applicable to a particular respondent.

In the findings section, key passages illustrate themes and categories. A more insightful and interpretive analysis of some of these passages (inspired by a discourse analysis) was also applied in order to provide a fuller understanding of their construction and meaning.

3.4.3 Use of a discourse analysis approach

In this thesis, discourse analysis refers to the study of all forms of written text and spoken interaction, and to understand what is being done and how it is being done through text and talk (Potter and Wetherell, 1987). However, it should be noted that there is no single definition of the term *discourse analysis* or agreement on what discourse analysis is (Gill, 2000). Several different analytical frameworks have been adopted in different disciplinary fields (Potter, 2004). Gee (2011a) argues that no one method is universally correct or applicable but each method can be adapted in order to suit the needs and demands of undertaking a discourse analysis. The current study drew on two different discourse analysis-based approaches in order to suit the research aims and answer the research questions. One of the aims of this research was to examine if the social norms approach led participants to change their behaviour. However, in an interview, participants' accounts can be determined by the social context in which they find themselves. Participants' accounts will vary according to its function and the purpose of the talk (Potter and Wetherell, 1987). Therefore, some participants may have claimed that their behaviour changed because they assumed that the purpose of the research was to find out that the intervention changed behaviour. Using some techniques of a discourse analysis approach to analyse the interviews enabled a focus on what participants *did* with their talk, rather than treating their talk as evidence for their behaviour change. Identifying and focusing on the discourses participants used to explain their behaviour enabled an in-depth understanding of why the social norms intervention might, or might not have influenced their behaviour.

Inspired by the work of Fairclough (2003) and Potter and Wetherell (1987), the form of discourse analysis used in this study involved employing some of the techniques commonly found in linguistic and rhetorical analysis of interview talk. For instance, this study focused on the rhetorical function and impact of the text, rather than attempting to link discourse and its mode of use to power, such as the approach used in the Foucauldian sense (Foucault, 1971; Marvasti, 2003). Potter and Wetherell (1987) argue that analysts should consider the different rhetorical techniques used in the text in order to understand the meanings that underpin respondents' discussions. The present researcher followed this approach.

The justification for employing elements of a linguistic and rhetorical analysis is that rhetorical analysis tends to focus on the ways in which discourses are constructed, and linguistic devices play an important role in the formation of these discourses (Fairclough, 2003; Bryman, 2012). Some

linguistic features of the interview talk were analysed to see how they were used by participants to accomplish particular actions. The linguistic concepts used in this thesis are defined in table 3.5.

Table 3.5 Linguistic concepts and features

Distancing	Language used to disassociate or disconnect from an utterance (e.g. using pronoun 'you' instead of personal pronoun 'I' (Gee, 2011b; Pennebaker, 2011).
Hedging	The weakening of a claim to avoid making a definite statement (Wood and Kroger, 2000).
Intonation Contour	The attitude or emotion in which an utterance is expressed, such as confidence, anger, sadness, etc. (Gee, 2011b, p. 34).
Legitimation	The legitimation of rhetoric by referring to the authority of tradition, custom or law. Also refers to rationalization and moral evaluation (Fairclough, 2003).
Metaphor	Metaphors are rhetorical devices, deployed to convince listeners or readers by putting a situation in a particular light. Use of a word or phrase that is not literal to express their intended meaning (Halliday, 1985; Dryzek, 2005, p.19).
Modality	The level of commitment respondents apply when making statements, expressing attitudes, judgements and assertions, e.g. using terms such as 'probably' establishes a degree of doubt, whereas 'certainly' marks a stronger truth claim (Fairclough, 2003).
Rhetoric	A linguistic device used to establish authority and make a persuasive argument (Bauer and Gaskell, 2000; Fairclough, 2003).
Self-Repair	A rhetorical device used to neutralize the negative impact of a word or comment that might be considered inappropriate (Langford, 1994).
Superlative	Exaggerated expression or expressing the highest in quality e.g. *longest; smallest, most, best* (Halliday, 1985; Soanes and Hawker, 2008).
Tag question	Turning an utterance into a question by adding an interrogative question at the end, e.g. "isn't it?"; "you know?" Tag questions can indicate assertion or reduced commitment (Baker and Ellece, 2011).
Truth claim	An attempt to assert that something is true. (Fairclough, 2003).

There is much controversy over the relationship between what participants say in an interview and their *actual* attitudes, experiences and behaviour (Alvesson and Sköldberg, 2009). Potter and Wetherell (1987) argue that utterances are context-dependent and do not reflect a true expression of the participant's beliefs. Therefore, it could be argued that researchers adopting a discourse analysis approach should avoid making inferences about the participant on the basis of what they say. However, some discourse analysts claim that utterances can convey insights, experiences and information about the topic being studied (Hollway and Jefferson, 2000; Alvesson and Sköldberg, 2009; Gee, 2011a). Language is used for different functions, not just to convey information and can provide an insight into what the participant using it is 'trying to do' (Gee, 2011a, p.50). Utterances can also reveal a participant's personality, attitude, motivations and social connections (Pennebaker, 2011). The view of some authors is that there is no reason to remain at the 'discursive level' of a text or to distance ourselves from interpreting meanings in utterances (Alvesson and

Sköldberg, 2009, p.235). Nevertheless, researchers should remain reflective when analysing texts and it is their responsibility to make interpretations from respondents talk cautiously.

The current study adopted this reflective approach. Although interpretations were made from the interviews regarding the accounts of participants, these were tentatively framed and alternative interpretations of the text were considered. Interview talk was interpreted on both the discursive level, which is language use and expressive mode of the text, in addition to the 'ideation level', in which the researcher offers possible interpretations of utterances. In the discussion section of this thesis, the interpretations go further to the 'level of action and social conditions' (Alvesson and Sköldberg, 2009, p.236). This is where the research aims to make inferences about the discourses in order to make conclusions about the data and its relevance to existing theory. The researcher agrees with the idea that taken beyond a subjective level, a linguistic and rhetorical analysis of accounts can contribute to new and inspiring insights.

An example of rhetorical and linguistic analysis of text

To illustrate how the linguistic and rhetorical impacts of a text can provide a richer understanding of constructions and meanings of participants' accounts, an example of the form of discourse analysis used in this research is presented here. The quote is from the interview with Ian. Ian reported that he switched off the television more often because of using iGreen. The quote is Ian's response to the interviewer's probing for an explanation for his claimed behaviour change:

1. Interviewer: Ok, why do you do that [switch off the television more often]?
2. Ian: It's because **I know**[1] leaving things on uses energy and I'm just conscious of
3. that now, that I should turn [the television] off.
4. Interviewer: Why do you think you **should** turn it off'?
5. Ian: Um… Umm… well, you hear these reports saying waste, like the adverts
6. say you shouldn't be wasting energy, water… and **I know** it's not good for the
7. environment.
8. Interviewer: Ok. What do you mean by you **shouldn't** be wasting?
9. Ian: Uhhh… Well, it's not being used, is it! So it's like waste, all this electricity
10. going to power a red dot all night! (Laughs)

The first point to notice in this quote is that Ian's explanation for his changed behaviour is delivered assertively. This assertiveness is marked by his emphasis of the phrase **'I know'** in the audio and the absence of modality in his response. The insistence and confidence with which this statement

[1] Bold text in the quote illustrates emphasised tone of voice in the recording

is communicated suggests that Ian is making a truth-claim; this implies a commitment to the veracity of the statement.

The following phrase in the same sentence 'and I'm just conscious of that **now**, that I should turn it off' suggests that Ian is trying to convey to the interviewer that he had not previously been aware of leaving the television switched on before using iGreen. Ian's assertiveness, indicated by his emphasised tone of voice and repetition of the phrase **'I know',** suggests that he wants to convince the interviewer that he changed his behaviour because of his knowledge about standby energy usage.

When the interviewer asks Ian to explain why he thinks he should switch off the television (line 4), Ian's assertive style of speech is replaced with modalisation. This is indicated by pauses and his use of the expression 'um', which signifies hesitation. The hesitation suggests a degree of uncertainty about the reason for his comments. The modality here indicates a reduced commitment to the views being expressed. His use of legitimation (e.g. his references to 'reports' and 'adverts') further suggests a reduced commitment to what he is saying, because these are not *his views* but what *reports and adverts say*. The use of legitimation also establishes authority for his claims in the eyes of the interviewer. For example, at the end of the paragraph (lines 6 and 7), it seems that Ian has now found an argument that he can present with confidence as he is more assertive in his closing sentence: 'and **I know** it's not good for the environment'.

In the final paragraph (lines 8 - 10), the modality of the text changes again. Ian seemed confused when asked by the interviewer to explain what is meant by 'you shouldn't be wasting' ('Uh… Well it's not being used, is it!') The hesitation and pause before answering are indicative of his perplexity. Ian seemed uncomfortable when questioned further by the interviewer. It is unconventional for us to challenge the validity of commonly espoused ethical positions; this might explain Ian's discomfort.

The explicit undesirability of waste is further suggested by Ian's subsequent remark 'all this electricity going to power a red dot all night! (laughs)', which is expressed in a sarcastic tone of voice. It is apparent that the term 'waste' has an assumed, common meaning that is so powerful that to be challenged about the meaning causes ridicule. This suggests that Ian responded in this manner because he assumed that his explanation for changing his behaviour (that 'you shouldn't be wasting energy') was rational and logical, thus was surprised about the interviewer's continued

questioning. Ian's laughter after the utterance was soft and diffident and his laughter could be an attempt at rhetorical self-repair intended to dispel the apparent sarcasm; he may have been concerned about offending the interviewer.

A number of possible interpretations can be made of the above quote from Ian's interview; some possible explanations are offered here. The text suggests that Ian is trying to convey that he had not been previously aware of leaving the television switched on before the study. An explanation for this is that Ian is trying to counter the assumption that he *should* have been switching off the television before the study. He could have construed the interviewer's question on why he changed his behaviour as a demand to justify his past behaviours. A lack of awareness is generally considered more socially acceptable than simply not caring about the environmental impact of one's behaviour, and therefore claiming ignorance provides an acceptable explanation in the eyes of the interviewer. His previous lack of awareness also provides a justification for changing his behaviour as a result of using iGreen; he is now more aware of leaving the television switched on, and therefore switches it off more often. Ian's assertive rhetoric in the second line of the quote are indicative of this interpretation, in which Ian seems to be able to present a convincing argument that he is now more aware of his behaviours and the implications of them ('It's because **I know leaving things on uses energy** and **I'm just conscious** of that **now**'). The phrase 'I know leaving things on uses energy' indicates Ian's attempt at persuading the interviewer that he changed his behaviour for a logical reason; due to his apparent knowledge of standby energy usage. The lack of modality in his talk is indicative of this rational explanation and hints at the function it may be performing in the text.

As discussed earlier, there is no way of proving Ian's claims or the suggested interpretations of the text. Nevertheless, applying techniques and concepts of a discourse analysis-based approach provides a richer understanding of Ian's rationale for his behaviour change. The text suggests that although he was previously aware of the importance of energy conservation, he was not aware of his own wastefulness. This not only provided Ian with a rational justification for changing his behaviour, but also presented a socially desirable presentation of self; he was knowledgeable about the impact of particular behaviours on the environmental and was willing to take action to reduce his environmental impact. The linguistic and rhetorical analysis of the text provides a deeper understanding of its meaning, as well as illustrates the basis of the interpretations made and how they were constructed, which may have been overlooked in other analytical methods. Using this discourse analysis approach prompted the researcher to constantly ask herself why she was reading

the text in a particular way and what linguistic and rhetorical features of it produced that reading (Potter and Wetherell, 1987). This helped her to critically reflect on her own interpretations of the text and consider alternatives. It is important to remember that the conclusions drawn from the data are speculative, and aim to offer an understanding of the possible impact of the iGreen intervention and the social norms approach and their potential for encouraging more pro-environmental behaviour.

3.5 Chapter summary

This chapter described and discussed the methodological strategy employed for this thesis. This research used a social norms intervention, which included a Facebook app called iGreen to deliver personalised individual and social norms feedback, followed by qualitative in-depth interviews. This is because the research was concerned with identifying the discourses participants used in their talk about iGreen, and interpreting and understanding the meanings of their responses to feedback on their environmental behaviours. This mixed methods approach was the most suitable method to take this study forward.

Although combining methods enables a rich exploration of the effects of a social norms intervention, it is nevertheless a difficult task to give a definitive account of how or why participants may have changed their behaviour in more pro-environmental ways because of iGreen. There is no straightforward method to determine whether social norms can encourage pro-environmental behaviour because it is difficult for people to recognise what influences their actions and to explain this. The research conducted for this study, therefore, relied on examining the codes, themes and the discourses that emerged from the data and interrogated the meanings that were embedded in participants' language. Furthermore, existing social norms research has predominantly used quantitative methods and this study contributed a new and novel approach, by using a bespoke Facebook app to deliver social norms feedback, as well as providing an in-depth understanding to this field. Following this chapter, the thesis focuses on presenting findings from the research methods described here.

4.0 Did the iGreen intervention encourage behaviour change?

The next three chapters report the research findings that underpin the main arguments of this thesis. One of the main findings is that participants in all three intervention groups claimed to have changed some behaviour, and there were no apparent differences between the groups' quiz answers. It is important to note that there was no evidence that these changes were encouraged by the social norms feedback and this will be discussed in chapter six. Explanations for why participants did change their behaviour, albeit not because of the social norms feedback, will be discussed in chapter five. The present chapter presents quantitative and qualitative evidence which suggests that participants changed some of their behaviours following the iGreen intervention.

The first part of this chapter (4.1) argues that some participants seem to have changed some of their behaviour following the intervention. The next part (4.2) discusses behaviour that participants claimed they tried to change but seem to have failed. Here it is argued that although the intervention did not successfully encourage participants to change some behaviour, it nevertheless encouraged them to try to change them. The final part of the chapter (section 4.3) focuses on behaviour that participants claimed that they did not attempt to change, and considers the discourses that participants employed to justify their reluctance to change these behaviours.

4.1 Behaviour that participants successfully changed

This section discusses the behaviours that participants said they changed and argues that the interview, quiz and post-intervention questionnaire data consistently indicate that participants changed their behaviour following the intervention.

One of the behaviours that participants seem to have changed is the boiling of water for hot drinks. Many participants reported that they began boiling only as much water as necessary because of using iGreen. An excerpt from the interview with Ian illustrates this:

Interviewer:	Yeah, ok. What did you make of the app, of iGreen?
Ian:	Yeah, I thought it was good, it was easy to use, um… it kinda made you think as well, like questions how many times do you fill up the kettle when you're boiling it, and thinking hmm, do I?... You know, I always used to fill it right to the top even though I only wanted one cup of tea! (laughs) so… now I only boil as much as needed instead of filling it right to the top.
Interviewer:	Ok. Why did you change that?
Ian:	…I don't know it just made me think really… that you don't need to boil that much, or… use so much water… Probably not the water, but the

	electricity really, not the water wastage 'cos it will get used anyway, so it's just using all that extra energy just to boil one cup is just not needed.
Interviewer:	Ok, does it use less energy then?
Ian:	I think so yeah, it definitely takes less time.

Note that Ian spontaneously introduces the topic of his changed behaviour when asked generally about iGreen. Initially, Ian responds to the interviewer's question on what he 'made of' the application by providing quite general comments (it was 'good' and 'easy to use'). This might be because the interviewer's question is vague, and therefore Ian responds in an equally vague manner. Ian then seems uncertain what to say next, as suggested by the expression 'um' and pausing before he continues. Ian's subsequent unprompted connection between the iGreen app and changed behaviour reflects his belief that using iGreen influenced the change.

Ian provides a detailed description of changing his behaviour. Firstly, the text suggests that using iGreen made him question his own behaviour ('and thinking hmm, do I?'), then made him realise what he did prior to using iGreen ('I always used to fill it right to the top even though I only wanted one cup of tea!'), and this subsequently influenced him to change the behaviour ('now I only boil as much as needed'). Ian's elaborate description adds credibility to his claims because he provides a detailed account of how his behaviour changed (Lincoln and Guba, 1985).

When Ian is questioned why he had changed his behaviour, Ian's response seems less confident. The text is modalised with frequent pausing and indefinite terms such as 'I don't know' and 'probably not'. This suggests that Ian is uncertain and is searching for a suitable reason to give the interviewer. The modality of the text then changes again when Ian seems to have discovered an argument that he can provide confidently; that he changed his behaviour because boiling the kettle with more water uses more electricity. His ability to provide a reasonable explanation for changing his behaviour also adds credibility to his claim that his behaviour changed, as he is able to provide a rational reason for the apparent change. Furthermore, the modality of the text changes and his previous uncertainty is replaced with assertiveness ('it's just using all that extra energy just to boil one cup is **just not needed**'[1]; 'it **definitely** takes less time'). His confident intonation contour[2] indicates that he is making a truth-claim (Fairclough, 2003; Gee, 2011b).

[1] Bold text in main body always illustrates author's emphasis unless otherwise stated
[2] See table 3.5 in chapter three for list of definitions of technical terms

Jane also reported that she boils the kettle with less water because of using iGreen. Like Ian, she provides a detailed explanation of her behaviour change:

Jane:	**Now this is something I changed after using iGreen**[1], I would fill the whole kettle up and you know, boil it, but now I only put enough water in. If there is water in the kettle that's too much and I'm the only one making tea and no one else in the house wants one I'll pour it out and use just enough for me.
Interviewer:	How comes you started to do that?
Jane:	Because I thought it's actually not necessary, 'cos every time you fill your kettle up it takes up more energy boiling a lot of water than it does for a little bit. And it's quicker! I even tested it when I did this [iGreen app], 'cos I boiled the water and timed how long it took, and then I timed how long it took to boil a little bit and then I waited half the time, so it did save electricity that way.

Like the previous excerpt from Ian's interview, the text explicitly links Jane's changed behaviour with using iGreen. This direct link suggests that using the iGreen app encouraged Jane's behaviour change, as stated in the opening sentence. Jane then provides an account of how she used the kettle previously ('I would fill the whole kettle up and you know, boil it, but now I only put enough water in'). Her account when recounting the behaviour change and use of the word 'now' reflects Jane's belief that she changed the way in which she uses the kettle because of using iGreen.

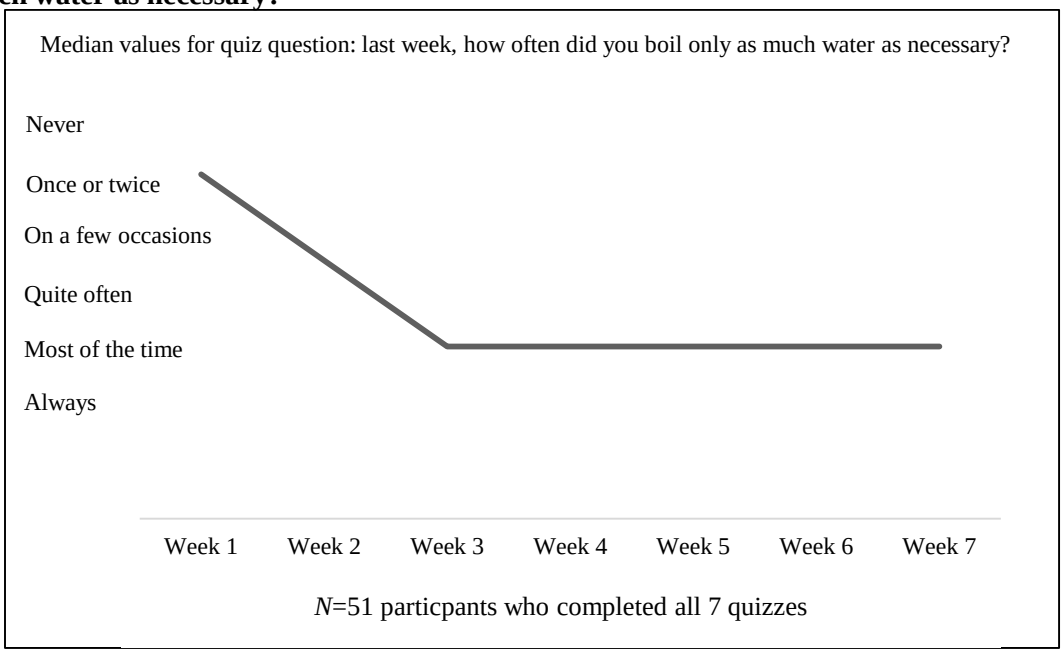
In the second paragraph, Jane provides an apparently convincing argument that her behaviour changed. Her use of assertion when explaining why she changed her behaviour 'it takes up more energy' and 'it's quicker', suggests that she is making a truth-claim (Fairclough, 2003). This rhetoric contributes to providing a credible rationale for her changed behaviour; that boiling the kettle with more water than needed is inefficient. The subsequent example of testing the efficiency of boiling the kettle with less water further adds credibility to Jane's account ('I even tested it', 'I timed how long it took to boil' and 'I waited half the time'). This again suggests that she is making a truth-claim and indicates a commitment to the veracity of the statement. From this rhetoric Jane seems to be trying to persuade the interviewer that her behaviour changed. The interviewer's question 'how comes you started to do that?' appears to have made Jane feel obliged to provide a rational reason, or perhaps evidence for her claims, which might be why she responded in this manner. This does not negate the value of Jane's account; on the other hand, it is possible that the

[1] Bold text within quotes is the participant's emphasis

absence of modality and her ability to present a convincing argument adds credibility to her account (Lincoln and Guba, 1985).

Consistent with participants' claims in the interviews, the quiz data suggests that they changed their behaviour regarding boiling the kettle with less water, as shown in the graph:

Figure 4.1 Change in responses to the quiz question: last week, how often did you boil only as much water as necessary?



The graph illustrates the median values for respondents' (*N*=51, respondents who completed all seven quizzes) answers to the question on boiling water. The median values showed a decrease amongst those who never boiled only as much water as needed from week 1 to week 7. The Friedman test[1] was used to analyse any statistically significant differences in quiz answers across the seven weeks, and this indicated that there was a statistically significant difference in the answers to this quiz question (N= 51; $d.f$ = 6; p< 0.00; χ^2 = 65.61), where the level of significance (p) was below 0.05. The quantitative data was consistent with the qualitative data in suggesting that there was a change in participants' quiz answers on boiling the kettle with as much water as necessary during the intervention.

[1] See chapter three for details

The research suggests that participants also changed a number of other behaviours during the study. These behaviours include switching off appliances more frequently, such as mobile phone chargers and the television. It was indicated in the previous section that during interviews participants attributed their changes when boiling the kettle to using iGreen. This was also the case for the changes they claimed to have made regarding the use of electrical devices. As Ben explains: 'with the type of questions asked in iGreen, after answering the first one you go round the house making sure everything is switched off… and then every week I'd make sure, as I said, things are switched off.' Like Ben, Irene also claims to have made changes in her use of electrical devices because of iGreen:

Interviewer:	Ok, how did you find doing the quiz every week?
Irene:	Oh it was fine, it wasn't too long, and I, I just had to think about it really, it kept making me think about, did I actually switch the plugs off, which I do do now to be honest.
Interviewer:	So when you say you turn switches off, what do you mean?
Irene:	Um, so the one by my bed, for my phone and for my light, I switch it off when I go to work, at the plug, um, that's the only ones I switch off 'cos I remember to do those, but I don't do the whole house, but it's just… I think it's from the iGreen application that I've done that.

The text illustrates Irene's claim that she switches off her mobile phone charger and her lamp at the plug socket because of using iGreen. However, using iGreen did not seem to influence Irene to switch off other appliances, as she asserts 'that's the only ones I switch off 'cos I remember to do those, but I don't do the whole house'. Irene's assertive language and frankness suggests that she is unconcerned about stating to the researcher that although her behaviour changed, the change was limited. This adds credibility to her account as she limits the extent of her behaviour change. If Irene was claiming that she changed her behaviour to create a more favourable impression in the presence of the interviewer (Edwards, 1957), then she might have reported switching off more appliances rather than just the two.

Another example that indicates a connection between iGreen and participants' behaviour change is shown in the next quote. The segment indicates that Ed switched off his mobile phone charger more frequently:

Interviewer:	So what did you make of it [iGreen]?
Ed:	I would say honestly, it changed my perception about, because obviously the questions were the same every week, ok, so there were certain questions that I can relate to now, even though I haven't done it for 3 weeks, where I know that I've made a change since I started at the beginning… to at the end, ok… so off the top of my head, um turning off my phone charger, turning off the power supply, at, at night, **that's something I've never done before, like never, unless we've had a power cut!** So that's something I tend to do now, and the reason I know I'm doing it is because the Sky Plus, I've been recording stuff, late at night, and I go to watch it the next day and it's sort of cut off half way through! That's because I've been going to bed and turning off all the plugs, so stuff like that.

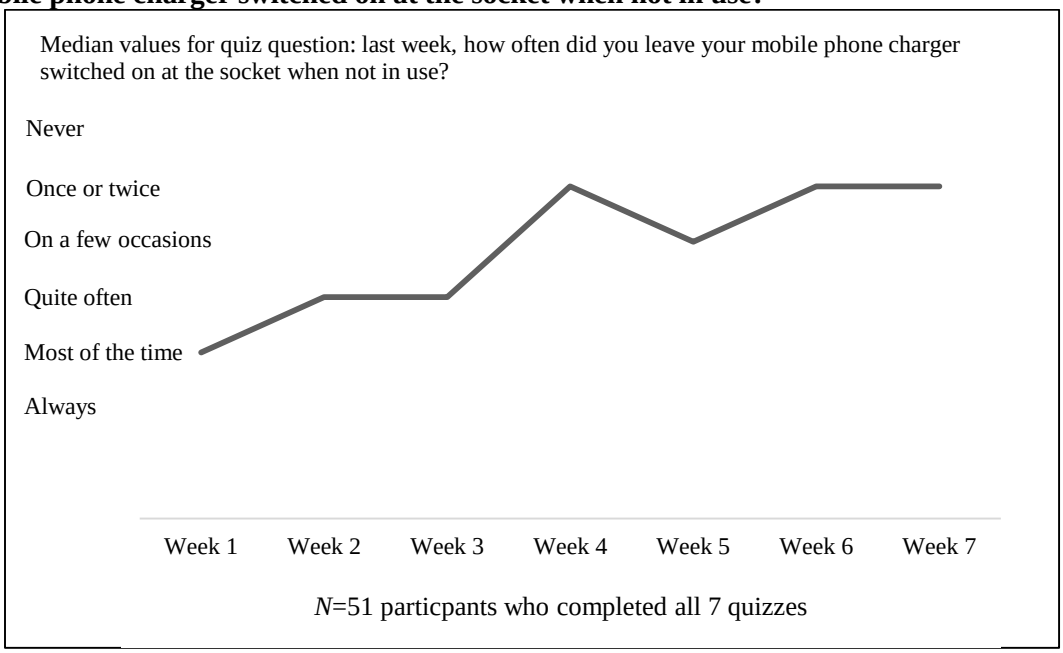
Like Irene, Ed spontaneously raises the topic of his changed behaviour when asked what he thought about iGreen. Most participants brought up the behaviour they changed without being prompted by the interviewer, indicating a 'degree of neutrality' (Lincoln and Guba, 1985, p.299). Neutrality is the extent that the interview responses are determined by participants and not by leading questions and this can add credibility to the findings (see chapter three). Ed and Irene's use of the phrase 'honest' is further indicative of this, which may be a rhetorical device to convince the interviewer that they had changed their behaviour.

Ed recounts that although it has been three weeks since he used the application, he can nevertheless remember the changes he made: 'so there were certain questions that I can relate to now, even though I haven't done it for 3 weeks, where I know that I've made a change'. This utterance suggests that Ed attributes his behaviour change to using iGreen. Ed's use of a specific example further illustrates that he thinks his behaviour changed: 'and the reason **I know I'm doing it** is because the Sky Plus, I've been recording stuff, late at night, and I go to watch it the next day and it's sort of cut off half way through!' His matter-of-fact rhetoric and assertiveness ('**I know I've made** a change; **I've never** done before; **I know I'm doing** it) contributes to the integrity of his claims because he is able to provide a specific example with conviction.

The interviews indicate that the behaviours participants changed became established in their daily routines. For example, Irene recounts that she switches off her mobile phone charger before she leaves for work, and Ed says that he switches off appliances before he goes to bed. It appears that participants changed particular behaviours that they were able to incorporate into their daily lives. The indication that their changed behaviour became embedded into their daily lives makes their assertions more plausible because these behaviours were feasible to incorporate.

The quiz data is consistent with participants' claims that they switched off appliances (e.g. the television and mobile phone charger) more often. For example, the quiz score for leaving a mobile phone charger switched on when not in use decreased over the course of the study (see figure 4.2).

Figure 4.2 Change in responses to the quiz question: last week, how often did you leave your mobile phone charger switched on at the socket when not in use?



The graph illustrates the median values for respondents' (*N*=51, respondents who completed all seven quizzes) answers to the question on how often they left their mobile phone charger switched on at the socket when not in use. The median values showed an increase in how often participants switched off their mobile phone chargers at the socket from week one to week seven. Assessment of the data using the Friedman test provided statistical significance of the difference in participants' quiz answers across the seven weeks for this question (*N*= 51; *d.f* = 6; p< 0.00; $\chi^2 = 43.01$). This indicates that participants' claims changed during the study.

There was also a change in participants' quiz answers on how often they switched off the television rather than leaving it on standby and how often they turned off home computers. The Friedman test results indicated that the change in participants' quiz data across the seven weeks was statistically significant for both questions, where the level of significance was *p*< 0.00 for the change in participants' answers on the question concerning switching off the television (*N*= 51; *d.f* = 6; *p*< 0.00; $\chi^2 = 35.21$), and *p*< 0.01 for the change in participants' answers on the question concerning

turning off home computers (N= 51; $d.f$ = 6; p< 0.01; χ^2 = 15.17). In the post-intervention questionnaire, 57% (N= 44) of participants agreed with the statement that they used less electricity because of iGreen. In the interviews, participants consistently said that they changed these behaviours. The consistencies between the data sets add credibility for participants' claims that their behaviour had changed.

The research also indicates that participants turned off taps when cleaning their teeth more frequently during the seven week intervention. The Friedman test results showed statistically significant differences in participants' quiz answers across the seven weeks for the question on turning off the tap when cleaning their teeth (N= 51; $d.f$ = 6; p< 0.00; χ^2 = 122.38). This was consistent with the data in the post-intervention questionnaire, in which 57% of respondents agreed with the statement that they used less water because of using iGreen. The interview responses were in line with the quiz and questionnaire data. For example, Gemma reported that she turned off the tap whilst cleaning her teeth more frequently because of using iGreen:

> Gemma: Most of the time I'd leave it [the tap] running, I'd kind of, I'm one of those people that wander around when brushing my teeth and I'd leave it on, um, so I wouldn't even be in the bathroom and leave it on! So I don't do that anymore now, I have to say that there are a couple of occasions when I still leave it on, but more often than not I don't.

Gemma explicitly admits that her behaviour change was limited ('I have to say that **there are a couple of occasions when I still leave it on**, but more often than not I don't.'). This could be interpreted as a credible claim because she explicitly limits the extent of her behaviour change. This is further suggested by Gemma's apparent acknowledgement of the irresponsibility of her actions prior to her use of iGreen: 'I wouldn't even be in the bathroom and leave it on!' She expresses this in a disapproving tone of voice. Gemma's tone and frankness suggest that her responses were not affected by interviewer bias (Silverman, 2011) as there seems to be a degree of neutrality in her claims. This adds value to the veracity of the claim that her behaviour changed.

The research suggests that participants changed some behaviour during the intervention, and in most cases this was in an environmentally sustainable domain. However, participants reported that their intake of bottled mineral water increased during the study, and therefore their behaviour changed in a less sustainable direction. As Ben explains: 'I've also started drinking mineral water everyday as well, which I never used to do'. Ben states that previously he drank more fizzy drinks, but this changed because of using iGreen:

> Ben: Just for the fitness as well, cos' obviously you need to be fit to ride one of these [points to his bike], I used to drink fizzy drinks and stuff like that but I've completely stopped that and started drinking mineral water every day.

The excerpt suggests that using iGreen influenced Ben to change his behaviour. However, it seems that it influenced Ben to adopt healthier behaviour rather than more pro-environmental behaviour. For this quiz question (on drinking bottled water), iGreen had an opposite directional effect to that intended (Tourangeau, Rips and Rasinski, 2000). The quiz question on how often participants drink bottled mineral water was intended to refer to the generation of plastic waste, yet the interviews revealed that participants interpreted the question as relating to the link between water consumption and health. Another example of this is in the interview with Joshua, illustrated in the following segment:

> Joshua: …a couple of times there just wasn't any need to change, so talking about water usage, how much do you drink mineral water? I drink it every day, I try to go to the gym as much as I can, so as a result you just drink mineral water and I felt like a lot of the questions are where you can make changes, but there's some that you don't have to make changes and you're being responsible and drinking mineral water is a good example of that.

The text shows a clear link between the question about bottled water and health. For instance, Joshua refers to 'healthy' behaviours such as drinking water every day and going to the gym. Joshua's statement: 'I felt like a lot of the questions are where you can make changes, but there's some that you don't have to make changes and you're being responsible' suggests that he may have changed behaviours that he believed were *irresponsible.* For example, leaving the television on standby or boiling kettles with too much water, as discussed in the previous section, may be considered irresponsible actions. However, because the question about drinking bottled mineral water seemed to be interpreted as simply *drinking water*, participants may have assumed that they did not need to change their behaviour. As Joshua indicates here, drinking bottled mineral water is considered a 'good example' of 'responsible' behaviour. This suggests that participants did not consider the iGreen quiz as exclusively environmental but more about being responsible in general.

4.2 Behaviour that participants attempted to change and failed to change

The research also suggests that participants *tried* to change some behaviours because of the iGreen intervention, albeit less successfully. For example, participants claimed they tried to take their own

shopping bags to the supermarket more often but usually failed to do so. An excerpt from the interview with Oswald illustrates this:

Interviewer:	Ok, yeah. So do you tend to take your own shopping bags to the supermarket?
Oswald:	You know what, I should show you how many bags I have in there [points to the kitchen] and I keep telling myself I'm gonna take it but every single time I forget, and this is another one [quiz question] that has made me make more of a conscious effort to take them and a few times I took my bag for life with me… but I tend to forget, I could walk past them several times and still forget!

In this passage, Oswald claims that the iGreen quiz encouraged him to try to take his own bags to the supermarket. For example, he says: 'this is another [quiz question] that has made me make more of a conscious effort to take them'. Although Oswald claims that the quiz influenced him to try to take his bags, he is explicit about failing to do so. This adds credibility to his account because he does not claim that he took them, which he might do if he was influenced by social desirability bias. He is open and frank about his forgetfulness, which is illustrated by the repeated use of the term throughout the quote ('every single time **I forget**'; 'I tend to **forget**' and 'I could walk past them several times and **still forget!**').

One interpretation of this text is that although participants did not change this particular behaviour as much as others, the intervention nevertheless influenced them to try to change this behaviour, or at least claim that it did. The researcher explored why participants seemed to remember to engage in the above mentioned behaviour changes (such as switching off televisions and turning off taps), but tended to forget to take their shopping bags to the supermarket. The interview talk suggests that taking shopping bags is difficult to implement into participants' everyday routine more than other practices, such as turning off taps, because they do not go shopping daily. The two following excerpts illustrate this point: one from an interview with Joshua who reports that taking his own shopping bags is difficult; the other from an interview with Nick who reports that taking shopping bags are not part of his 'routine'.

Interviewer:	What do you mean it's not easy?
Joshua:	Easy is where I don't have to go above and beyond to what I'm already doing, that's easy for me, so... bringing my own bag that's where I have to plan, it's not easy. You have to get the bag from wherever it is, put it in the car, remember to take it into the supermarket and there's a lot more of a thought process there.

Interviewer:	Why did you do some things and not other things?
Nick:	Cos you forget, I think, you're just going on your everyday routine... and it's not planned in my routine, like brushing my teeth and washing up is planned, I just do it, but shopping is never planned.
Interviewer:	Yeah, yeah.
Nick:	I never know when I'm going shopping so I never carry them… but if I know that I'm going, like if I start doing a weekly shop then I will start taking my own bag because of iGreen, if I start to know when I am gonna go shopping then I'll definitely take a bag, a big bag of my own, but at the moment I just, just don't know when I'm going.

In both cases, planning seems to be linked to taking shopping bags to the supermarket and participants incorporating this change into their everyday routine. For example, in the first quote Joshua says 'bringing my own bag that's where I have to plan, it's not easy'. In the second quote from Nick's interview, he discusses 'planning' and 'routine' when explaining why he does not take shopping bags.

In the excerpt from Joshua's interview, taking shopping bags is represented as a difficult task that exerts effort. For example, the way in which the process is listed ('You have to get the bag from wherever it is, put it in the car, remember to take it into the supermarket') and the tone of voice Joshua uses suggests that it is a laborious task. This is further implied by the comment 'there's **a lot more** of a thought process there.' It seems that he is trying to convince the interviewer that he has a logical explanation for not being able to change this particular behaviour because he claimed that he had successfully changed others. The rhetorical aim of Joshua's talk seems to be concerned with persuasion; he argues that taking shopping bags is different from the other behaviours that he changed. The difficulty and planning of the behaviour appears to be a rational justification for not being able to change it, and this argument is also put forward by other participants in separate interviews.

The passage from Nick's interview also shows a connection between planning and not taking shopping bags ('you're just going on your everyday routine... and **it's not planned** in my routine'). Other behaviours, such as turning off the tap while cleaning one's teeth is perhaps considered part of peoples' daily routines, and therefore they are easier to remember ('brushing my teeth and washing up is planned, I just do it, but **shopping is never planned**').

It should be noted that although Nick claims to forget to take his shopping bags, the excerpt indicates that using iGreen has nevertheless influenced him to want to change this behaviour ('if I start doing a weekly shop **then I will start taking my own bag** because of iGreen'). Although

using iGreen did not influence participants to take their own shopping bags, it might have encouraged them to say that they want to.

The interview talk suggests that because shopping is not an activity that some people do daily, it is more difficult to change and incorporate into one's routine. As discussed in the previous section, participants described the behaviours they had changed as established into their daily routines, such as turning off appliances before going to bed or before leaving for work. Shopping does not seem to be a part of an individual's daily routine, and therefore it is more difficult to remember to take shopping bags.

In this section, it has been argued that using iGreen seems to have encouraged some participants to try to change some of their behaviour. Although the data suggests that they were unable to incorporate some behaviour into their daily routines, participants were frank about this during interviews. It is possible that participants were not entirely influenced by social desirability bias or effected by the interviewer, as they may have claimed to change more than they did if this was the case. Furthermore, participants only claimed to change *some* behaviour, which suggests that they did not feel obliged to answer the questions in a socially desirable way. Many participants explicitly stated that they were unwilling to change some of their behaviours. Behaviour that they did not change and possible explanations for their reluctance to change them is discussed in the next section.

4.3 Behaviour participants did not attempt to change

The previous sections discussed behaviour that participants said they had changed, or tried to change, because of the intervention. Explanations for their behaviour change is discussed in the next chapter. The remainder of this chapter looks at behaviours that participants did not attempt to change following the intervention. There were a number of quiz questions concerning particular behaviours in which participants' answers did not change. Analysis of the quiz data for these questions showed that the median values of participants' answers were similar across the seven quizzes and the statistical assessment using the Friedman test confirmed that there were no significant changes in participants' answers for these questions (see table 4.1). This suggests that they did not change these behaviours during the study. The research identified a number of pro-environmental behaviours that participants were not willing to change and the interviews were used to explore why; this is discussed in this section.

During interviews, although some participants said that they were concerned about the environment, they nevertheless were strongly averse to adopting some pro-environmental behaviour. Participants were articulate about the explanations underlying their unwillingness to adopt some environmental behaviours. Some behaviour seemed irrelevant to them, and therefore their answers remained the same throughout the seven quizzes. For example, responses to questions about using public transport more and the car less for short journeys did not change because most participants said that they already used public transport and many did not own a car. The post-intervention questionnaire data consistently indicated that very few participants (11%) changed behaviours concerning their mode of transport used during the study. Other behaviours did not change due to participants claiming that they already did them prior to using iGreen, such as turning off lights when leaving a room.

Table 4.1: Friedman test results for change in participants' quiz answers across 7 weeks

Quiz question	Significance level of change in quiz answers
Last week, how many baths or showers did you take?	N= 51; $d.f$ = 6; p= 0.85; χ^2 = 2.62
Last week, how many clothes did you re-wear before washing?	N= 51; $d.f$ = 6; p= 0.29; χ^2 = 7.29
Last week, how many of your main meals (including breakfast) contained no meat or fish?	N= 51; $d.f$ = 6; p= 0.28; χ^2 = 7.44
Last week, how often did you leave lights on when you left a room for a long time (including hallways and corridors)?	N= 51; $d.f$ = 6; p= 0.79; χ^2 = 11.33
Last week, how often did you take public transport, walk or cycle to school, work, college or social/recreational activities?	N= 51; $d.f$ = 6; p= 0.51; χ^2 = 5.20
Last week, how often did you use a car for short journeys?	N= 51; $d.f$ = 6; p= 0.99; χ^2 = 10.67

For the remaining unchanged behaviours, participants said that they were simply unwilling to change them. Three particular behaviours that participants said they would not change were showering less frequently, re-wearing particular items of clothing more and eating more vegetarian meals. The interview talk suggests that these behaviours are conceptualised as extreme and not normal to adopt. Participants describe these behaviours as 'too green' and their use of the *too green discourse* suggests that some pro-environmental behaviour change is restricted by implicit norms about what *green people* do and what *normal people* do.

One interview clearly illustrates the use of the *too green discourse*, as shown in the following excerpt from the interview with Krish. The response in the passage was prompted by the researcher, who asked Krish why he would not eat more vegetarian meals:

Krish:	To stop eating meat is a bit extreme, it's just too green… so I'm not gonna do that. I'll do my bit, I'm not gonna be climbing trees or campaigning in that sort of way, but I'll do my bit, you know.

The key event in this segment is Krish's characterisation of the behaviour as 'too green'. His talk suggests that there is an implicit difference between green behaviours that are normal and those that are not normal ('extreme' and 'too green'). This is further implied by the phrases 'climbing trees' and 'campaigning' in relation to being *too green*. Krish expresses this comment assertively and in a disapproving tone of voice (indicated by the recording). His use of the metaphor 'climbing trees' in association with behaviours that he would not do suggests ridicule and disapproval of behaviour that is 'too green'. The metaphor may be used here to convince the interviewer that being 'too green' is a form of lifestyle that is not considered conventional. This is similar to Dryzek's (2005, p.190) analysis of environmental discourses, which suggests that for some people being green is a matter of leading a green lifestyle, and leading a green lifestyle is often vegetarian. In the *too green discourse* there is a strong desire not to be seen as being green and vegetarianism is represented as being green, which use of this discourse suggests is socially unacceptable.

Krish may have used the *too green discourse* in an attempt to convince the interviewer that it is acceptable not to change some pro-environmental behaviour because they are considered not normal. For example, his repeated argument that he 'does his bit' suggests that the behaviours he claimed to change are considered an adequate contribution to environmental sustainability, and therefore it is acceptable not to adopt some other pro-environmental behaviours that are *too green*.

Another example of the *too green discourse* is illustrated by the case of Joshua when asked about his showering habits:

Interviewer:	Ok, showering is the first question, how many showers do you take in a week?
Joshua:	Oh, you see… one of the things you've got to take into account is cultural differences, I know this guy at work who's all environmental and that and he literally washes only once a week and that to me is disgusting… I'm not a massive save the earth person… but I do try and be as responsible as possible…. but I think that's pretty standard for most people - or of **my**[1] peers.

[1] Respondent's emphasis

There are a number of points in this quote that illustrate the distinction between behaviour that is normal and behaviour that is *too green* to adopt. Firstly, Joshua uses the term 'cultural differences' when describing a work colleague who is 'environmental' and apparently showers once a week. Joshua also describes this as 'disgusting'. Where the previous excerpt from Krish's interview hints at disapproval of environmental activists (Krish: 'I'm not gonna be climbing trees or campaigning'), the present quote explicitly conveys disapproval and reflects the negative impression of particular environmental behaviour and the people who adopt them.

Joshua's use of the phrase 'I'm not a massive save the earth person' indicates that he differentiates himself from people who are environmental and want to 'save the earth' and he uses this as justification for not changing his showering practices. Similar to Krish's use of the *too green* discourse, it seems that Joshua uses the *too green* discourse to justify why he did not change some behaviour during the study. For instance, whilst he argues that he is different from environmental people and the behaviours they do, he also states that he tries to 'be as responsible as possible'. This is similar to the comment from Krish's interview about 'doing his bit' as they both suggest that this is a plausible explanation for only changing some behaviours. The utterance 'that's pretty standard for most people' implies that Joshua thinks that his behaviour is considered normal. This again illustrates an established distinction between environmental activists and *normal people*. The rhetorical aim here is perhaps an attempt to persuade the interviewer that his justification for not changing this behaviour is rational, because he is conforming to norms related to environmental behaviour that *normal people*, like him, adopt.

Joshua then adds that his behaviour is standard for his peers. This may be a form of rhetorical self-repair and impression management as he has indicated that environmentalists are not 'standard' and this could offend the interviewer, who is likely to be an environmentalist given the nature of the study. Hence he immediately changes the framing of his comment from generalising ('for most people') to people who he personally identifies with (his peers). Furthermore, the passage, unlike the segment from Krish's interview, is characterised by modalised speech and hesitation. Joshua softens his voice, pauses often and uses modal terms such as 'Oh you see', 'I think' and 'pretty', which suggests a lack of commitment for what is being said. A possible explanation for this is that Joshua was concerned with offending the interviewer, who could be an environmentalist due to the research context. He seems to use strategic tactics in which negative presentation of 'green people' is combined with tactics of impression management, such as positive presentation of self (he tries to 'be as responsible as possible').

The interview with Pete also indicates that there is a difference in behaviours that green people do and environmental behaviours that normal people do. Like the excerpt from Joshua's interview, Pete's talk also suggests that there is an established norm to shower daily, and those who do not conform to this norm are described as environmental activists who are not normal. The following passage illustrates this point:

Interviewer:	Ok, what's the main reason you have to shower every day?
Pete:	Because I have been socialised to shower every day, that's just what people do, you wash every day, it's a normal thing. I mean it's what everyone does. Except for maybe those weirdo's who camp outside Hyde Park just to [physical gesture of air quotes] save the planet and that (laughs).

The excerpt suggests that daily showering has been normalised. This is indicated by the use of normative comments: 'because that's what **people do**' and 'it's what **everyone does**'. Showering seems to be associated with social acceptance and social norms concerned with normal people ('it's a normal thing'). Pete's comment 'except for maybe those weirdo's who camp outside Hyde Park just to save the planet' and his physical gesture of air quotes indicates ridicule and negative stereotyping of environmental activists.

Participants reacted similarly when questioned about re-wearing clothes before washing them. They appeared repulsed by the idea of re-wearing some items of clothing. Participants claimed that they already re-wore most of their clothes, and therefore did not need to change this behaviour. However, when questioned about this further, some participants said that they were reluctant to re-wear a number of similar items, including underwear, shirts and socks. They said that they were unwilling to re-wear these items of clothing due to concerns about smelling, feeling dirty and uncomfortable. They tended to use the *too green discourse* to justify not re-wearing these items of clothing because it was not what normal people do.

The research indicates that some pro-environmental behaviours are seen as not normal to adopt. There are implicit and established differences between environmental behaviours that are considered normal and behaviours that are not normal, and these latter behaviours are generally associated with environmental activists and being *too green*. In this study, people distance themselves from an environmental identity and this seems to be an adequate justification for not adopting particular behaviours; because those behaviours are specific to environmental activists or extremists who are *not normal*. As discussed in chapter two, this has been recognised in previous

research, which suggested that being green was considered as 'weird' and 'hippy' (Lorenzoni, Nicholson-Cole and Whitmarsh, 2007, p.451). In line with Lorenzoni, Nicholson-Cole and Whitmarsh's study, this research suggests that participants are unwilling to change particular behaviours because of the impact it will have on their presentation of self.

This research has distinguished between environmental behaviour that some people are willing to change and those that they are unwilling to change. A possible explanation for participants' unwillingness to change some behaviours is that particular behaviours do not relate to the norms of their social identity. Social identity is derived from a group and shapes how an individual identifies himself[1] (Koger and DuNann Winter, 2010; Gee, 2011b). As the above mentioned excerpts suggest, some participants were reluctant to adopt behaviours they considered 'too green' and their comments indicated that these behaviours are what *green people* would do; not what normal people would do. As discussed in chapter two, a green discourse may exist in society and is widely available and shared, which in turn can influence the way people perceive environmentalists and those who partake in particular 'green' activities (Van Dijk, 1990). The social function of communicating the *too green discourse* may be a way to normalise social knowledge with other in-group members and for respondents to illustrate how they deal with particular green behaviours that are considered unconventional in the social identity of their in-group. When participants were questioned about their unchanged behaviours, they spontaneously told the interviewer that they do not want to 'save the earth', 'campaign' or be 'too green'. This suggests that it may be socially acceptable to change some pro-environmental behaviour, such as those discussed earlier in this chapter (section 4.1), but to adopt other behaviours is not in line with the norms and conventions of some people's social identity.

These findings are also in line with some of the literature that attempts to explain the gap between environmental awareness and displaying pro-environmental behaviour (Hobson, 2003, see chapter one). Although some people are aware of the impact of some of their behaviours, they are unwilling to change some of them. This may be due to the social norms associated with particular behaviours, and these in turn influence and shape people's decisions on changing those behaviours. The pressure of widely accepted social norms and expectations seem to outweigh environmental concerns. If the dominant norm promotes behaviours that are not environmentally sustainable (e.g.

[1] See chapter two

to shower daily), 'pro-environmental behaviour is less likely to occur and the gap between attitude and action will widen' (Kollmuss and Agyeman, 2002, p.242). The implications of these findings will be discussed in chapter seven.

4.4 Chapter summary

The evidence presented in this chapter suggests that participants changed some of their behaviours as a result of the iGreen intervention. The interviews also revealed that participants tried to change some behaviour but failed to do so. This indicates that they may not have over claimed the extent of their behaviour change. It was also argued in this chapter that participants did not change other behaviours covered by the iGreen quiz. Participants asserted that they were unwilling to change certain behaviours; further suggesting that they did not simply change their behaviours as a result of social desirability bias or interviewer effects. Data was presented that suggested the existence of the *too green* discourse. This discourse underpinned participants' arguments for not changing particular behaviours.

Although the intervention encouraged participants to change some of their behaviours, the social norms feedback did not seem to have an impact. Therefore, the interviews explored why and what might have encouraged these changes. The following chapter describes the discourses participants used to explain why they changed some of their behaviours.

5.0 Behaviour change: discourses used by all participants

The previous chapter argued that there was some evidence that participants had changed some of their behaviours during the iGreen intervention. The interviews suggest that behaviour change was not because of the social norms feedback. The current chapter, therefore, considers participants' explanations for changing their behaviour.

A range of discourses were identified by studying the interview talk. Three key discourses that relate to participants' justification for changing some of their behaviours were identified. The first discourse concerns participants' explanations for not engaging in particular pro-environmental behaviours prior to using iGreen, this is called the *discourse of ignorance.* The second discourse, the *discourse of compliance,* is used by participants to legitimise the changes in their behaviour by representing their new behaviours as a social obligation. The third and final discourse that will be discussed in this chapter, the *moral discourse,* represents the adoption of more pro-environmental behaviour as a moral obligation. In some interviews, all of these discourses are used. Thus, at times participants' accounts may vary and appear contradictory. As discussed in chapter three, discourse analysis treats account variability as a normal phenomenon and focuses on the construction of accounts and their possible function (Potter and Wetherell, 1987). Contradictory accounts presented in this chapter are treated as such.

5.1 Discourse of ignorance

This section introduces one of the discourses used by participants in discussions about their changed behaviour during the study; the *discourse of ignorance*. This discourse is used by participants to justify why they did not behave in a pro-environmental way before the intervention.

The *discourse of ignorance* is characterised by participants' claims to a lack of awareness or knowledge of earlier behaviours before using iGreen. Hence, the term *ignorance* is not used here in the derogatory sense but to mean *lack of knowledge.* Participants who use the *discourse of ignorance* claim that they had not been previously aware of their behaviours prior to using the iGreen app, and therefore having used iGreen they are now more aware and subsequently changed their behaviour in more pro-environmental ways.

An example of the use of the *discourse of ignorance* is found in the interview with Nick. In chapter four, it was explained that Nick claimed to have changed some of his behaviours, including turning off taps whilst washing up and cleaning his teeth. The following passage is prompted by the

interviewer probing Nick for an explanation of his earlier comment in the interview; that he now turns off the tap more often because of the intervention.

Interviewer:	So why did you change that [turning off the tap while brushing your teeth]?
Nick:	...I didn't realise that I was wasting water, I thought I was just using the water to wash my face or brush my teeth and I thought I'm actually physically using the water, I'm not wasting it because I needed it, but then I saw it's just running and running and running and it's being wasted because it's not needed… I didn't know it was a waste, you know.

At the beginning of the quote, Nick hesitates before he responds. Nick's hesitation suggests a degree of uncertainty of how to answer the interviewer's question. As discussed earlier in this thesis, people are unconscious of many of their actions or the reasons behind them (Giddens, 1984; Nolan *et al*. 2008). Therefore, it is possible that Nick's hesitation is a result of his own uncertainty for changing his behaviour. However, after the initial hesitation, the talk lacks hesitation or any pauses; this suggests that Nick is able to provide an answer to the interviewer's question. It is at this point that the *discourse of ignorance* is introduced ('**I didn't realise**[1] that I was wasting water').

This passage indicates that Nick is searching for a way to defend himself against the implicit argument that he should have been turning off the tap before the study. For example, after the initial hesitation, Nick spontaneously denies that he had previously been aware that he wasted water, which indicates a defensive reaction to the interviewer's question. The term 'waste' is generally negatively connoted, and therefore Nick may have felt that the interviewer had formed a negative opinion of him because his past behaviour was wasteful. Although the interviewer does not say that Nick had been wasteful, Nick's reply indicates that he felt that he should rationalise his past wasteful behaviour. Furthermore, the audio recording indicates that Nick speaks in an animated and defensive tone here. The elaborate explanation for his past behaviour and repeated argument that he had not previously been aware of leaving the tap running ('I didn't know it was a waste, you know') further hints at the defensive nature of his talk.

The use of the *discourse of ignorance*, in addition to the defensive nature of Nick's talk, indicates that Nick interpreted the interviewer's question as judgemental of his past behaviour. The function of this discourse may be to convince the interviewer that he had not been previously aware of the

[1] Bold text in main body always illustrates author's emphasis unless otherwise stated.

wastefulness of leaving the tap running. As discussed in chapter three, the way in which an individual wants to present himself during an interview has an influence on what they say. Nick may be concerned that the interviewer disapproves of his past behaviour, and therefore he uses the *discourse of ignorance* to present a more socially desirable presentation of self. Ignorance is usually considered more excusable than other attitudes, such as a lack of concern for the environment. Thus, Nick's claim that he had not been aware of the wastefulness of his past behaviour is likely to be considered a preferred justification in the interview.

In the interviews, it is apparent that some participants implicitly construed the interviewer's general question about why they changed their behaviour as a demand to justify their past behaviours (as illustrated in the above excerpt from the interview with Nick). In other interviews, participants were explicitly asked why they had not done these behaviours before the study and these participants also use the *discourse of ignorance* to justify their past behaviours. For example, in the next excerpt, the interviewer asks Krish why he changed his behaviour and then directly asks why he had not done them before using iGreen.

Interviewer:	Why did you change these things then? Why didn't you do them before [using iGreen]?
Krish:	They just never really crossed my mind, I was in a routine, I wasn't thinking that the TV is on standby, the lights on, it's not something that ever crossed my mind and that's why I was just in a habit of doing things then when this [iGreen] came up, it made me think about things more and that's why I changed… it made me more aware.

It is possible that Krish interpreted the interviewer's direct question as being judgemental. To question an individual about why they did not do something could imply that they *should have* been doing it. An explanation for the use of the *discourse of ignorance* here is that Krish is attempting to counter the assumption that he should have been turning off the television and the lights before the intervention. For example, the phrase 'I wasn't thinking that the TV is on standby, the lights on' and the repeated use of the phrase 'that never crossed my mind' indicates that Krish had not been previously aware of his past behaviours and justifies his new behaviours- he is now more aware.

Krish also describes his previous behaviour as a 'habit' and 'routine' in order to justify his past behaviours. The text indicates that Krish is attempting to provide a convincing argument that his ignorance is a justification for his past behaviours, whereby 'a habit' is represented as an excuse for his past behaviour. To describe behaviours as *habits* is generally taken-for-granted and

considered acceptable without a need for further explanation. The text indicates Krish's line of reasoning that he changed his behaviours because iGreen made him more aware of his behaviour and encouraged him to change his 'habits'.

In the next passage, we see that Lisa uses the *discourse of ignorance*. Like Krish, she also rationalises her ignorance as a result of her previous behaviours being a 'habit':

> Lisa: The questions did make me think a few things, you know… Like unplugging the phone charger, I never thought about that before so it did… it did make me think… It was like a memory jogger that I shouldn't be doing those things, those bad habits…But **I didn't know that these things were bad**, you know, that they hurt the environment. They were just **my habits and I didn't know I was doing them**.[1]

At the beginning of the quote, Lisa softens her voice and intersperses her talk with pauses. This initial hesitation suggests uncertainty and hints at a degree of self-consciousness for what she is saying. Lisa appears embarrassed about admitting to the interviewer that she had not previously been aware of her behaviour. Her talk is also modalised with the repeated use of the tag-question 'you know' and she hesitates before each comment, which further suggests a reduced commitment for the statement. However, the modality of the text then changes and the modalised comments are replaced by assertive phrases and reduced hesitation (e.g. '**I didn't know** that these things were bad'; 'they were just **my habits and I didn't know I was doing them'**). Lisa now seems to be confident with her argument and her assertiveness indicates that she is making a truth-claim. Lisa's confidence and assertiveness suggests that she is arguing that ignorance is an acceptable justification for her past behaviour, and because her past behaviour is justified as 'a bad habit', it is assumed that this is an acceptable explanation.

5.1.1 Interpretations of the use of the discourse of ignorance

The above quotes illustrate the use of the *discourse of ignorance* to justify previous behaviours prior to the intervention. Use of the *discourse of ignorance* suggests that people are unaware of the consequences of some behaviours because they are habits. This can be interpreted in line with Giddens' (1984) structuration theory discussed in chapter one. Structuration theory states that people carry out routine practices in their *practical consciousness* and this can lead to unintended consequences of actions. For example, in this study, participants did not seem aware of their

[1] Bold text within quotes represents participant's emphasis. Lisa raises her voice and stresses these words.

everyday habits and this led to behaviours that were not environmentally sustainable. Chapter seven looks at this in more detail.

The use of the *discourse of ignorance* also suggests that Nick, Krish and Lisa were previously aware of the importance of environmental protection, but were not aware of their own wastefulness. The above examples imply that participants are arguing that they had been unaware of their past behaviours, and answering the iGreen quiz questions made them more aware of the wastefulness of these behaviours and reconsider what they do. For example, the text from the interview with Nick suggests that he had not previously realised that he was wasting water whilst cleaning his teeth but now he does. Similarly, the text from the interview with Krish indicates that he had not reflected on his actions until iGreen encouraged him to ('I was just in a habit of doing things then when this [iGreen] came up, it made me think about things more'). Lisa also argues that she was unaware of her actions prior to using iGreen and that it made her more aware ('so it did… it did make me think'). As suggested by Lorenzoni, Nicholson-Cole and Whitmarsh (2007), this study also suggests that leaving on appliances become 'ingrained as unconscious habitual behaviours, making them unquestioned'.

These findings are also in line with Hobson's (2003) work (see chapter one), which suggests that people are more likely to adopt pro-environmental behaviour when they rethink and reconsider their personal practices. Participants in this study seem to be saying that answering the iGreen quiz questions made them rethink the implications of their behaviours and subsequently change them in more sustainable ways. This is discussed in chapter seven.

5.2 Discourse of compliance

This section explores another discourse that participants use to justify the changes in their behaviours that occurred during the intervention: the *discourse of compliance.* This discourse legitimises participants' changed behaviours by representing pro-environmental behaviour as a social obligation governed by established norms about pro-environmental behaviour.

One interview clearly illustrates the use of the *discourse of compliance*. The following passage is a reply to the interviewer's probing for an explanation of Nick's earlier comment that he changed his behaviour because 'you should be green'.

Interviewer:	Why do you think you should be green?
Nick:	…because they're all telling you, that's all part of society isn't it, if society's telling you to be green then you should. Although you don't always follow what society does in certain respects; you know that being green isn't a bad thing, being green is seen as a good thing, a positive thing. So if society tells you to do something that you perceive to be bad, then obviously you don't do it but being green isn't something that is bad so society is promoting being green as a good thing so you say to yourself ok, I should be doing and being what society and the majority of people in society are saying you should do.

The *discourse of compliance* is clearly evident in this passage. Nick's reply to the interviewer's questioning of why he thinks he should be green is immediately associated with conforming to a social demand. For example, the phrases: 'because **they're all telling you**' and 'if **society's telling you to be green then you should**' include a reference to an external source ('they're all' and 'society'). The text represents pro-environmental behaviour as a social obligation and suggests that 'being green' is an act of complying with societal norms (as suggested by the phrase 'I should be doing and being what society and the majority of people in society are saying you should do').

The text here indicates that there are established injunctive[1] social norms about 'being green'. Nick seems to be justifying the changes in his behaviour by saying that he complied with these implicit norms. This is reinforced by the repeated use of the term 'should' and the use of the second person throughout the passage ('**you** should'; '**you** know'; '**you** don't do'). This frequent use of distancing pronouns ('you' rather than the personal 'I') distances him from the explanation provided (Pennebaker, 2011). The constant reference to the second person implies that 'being green' is a matter of complying with external demands, in contrast to moral obligations, where we might see the individual reference of 'I should' rather than 'you should'. The use of injunctive comments throughout the text further indicates this point ('being green is seen as a **good** thing, a **positive** thing, and 'society is promoting being green as a **good thing**,').

On the other hand, it should be noted that Nick also refers to personal morals in the passage. For example, he says 'Although **you don't always follow what society does** in certain respects [...] So **if society tells you to do something that you perceive to be bad**, then obviously **you don't do it**'. He seems to be saying that he does not simply conform to societal norms and that his personal morals (what he perceives as 'bad') also determines his behaviour. However, he continues to use

[1] Injunctive social norms specify what people typically approve (or disapprove) and what 'should be done' (Cialdini, Reno and Kallgren, 1990, p.1015. Also see chapter two).

distancing pronouns throughout the sentence ('**you** don't always follow'; 'that **you** perceive as bad'; '**you** don't do it') which further distances his personal views from the explanation (Gee, 2011b, p.107, see chapter three). In chapter two, it was argued that people tend to deny conforming because there is no logical explanation to conform (Goldstein, Cialdini and Griskevicius, 2008). The findings here can be interpreted by this argument: Nick may be uncomfortable saying that he simply conforms to societal norms because it presents him as not having control over his behaviour.

The use of legitimation (the frequent reference to 'society') establishes the authority of Nick's claims (for example, 'you should be green' because 'society's telling you to'). Nick's use of legitimation here may be an attempt to convince the interviewer that his justification for changing his behaviour is rational; where rationality can be defined as conforming to societal norms. Previous research suggests that people are likely to admit to complying with an authoritative figure (such as 'society') to justify their actions because it removes responsibility from the individual and focuses attention on an external and authoritative source (Milgram, 1974). Hence, Nick's use of legitimation in the above excerpt allows him to justify his changed behaviour by not taking personal responsibility for his actions. Deflecting responsibility for his actions is consistent with his use of the *discourse of ignorance* to justify his changed behaviour in the previous section (5.1). Nick's use of these discourses (ignorance and compliance) shift accountability for his behaviour to factors beyond his control, which provides a socially acceptable explanation for his behaviour changes.

Another example of the use of the *discourse of compliance* is illustrated by the case of Quinton in the following excerpt. The quote is a response to the interviewer's probing Quinton for further explanation following his claim that he now turns off the tap while cleaning his teeth.

Interviewer:	Hmm, yeah, ok, what was it about iGreen [that made you turn off the tap whilst brushing your teeth]?
Quinton:	Well it was pretty much that what you see is what you get type scenario, I mean you don't have to be a rocket scientist to work out what this iGreen app is trying to achieve, um, what's right or wrong, so literally as soon as I finished taking [the quiz], it had an impact straightaway because it was just so to the point. There wasn't much room for interpretation, it was either are you wasting this much water or are you not, there wasn't no two ways about it.

Although the iGreen quiz questions did not explicitly instruct participants on what they *should* or *should not do*, the interview talk suggests that the quiz questions acted as implied injunctions that exhorted particular behaviours. For example, when asked by the interviewer what it was about iGreen that made him turn off the tap, Quinton uses a number of phrases suggesting that the quiz

questions communicated injunctions ('it was pretty much that what you see is what you get'; 'you don't have to be a rocket scientist to work out what this iGreen app is trying to achieve, um, what's right or wrong'). It seems that Quinton is arguing that he changed his behaviour because he complied with these injunctions ('so literally as soon as I finished taking [the quiz], **it had an impact straightaway** because it was just **so to the point**').

Quinton's assertive and matter-of-fact rhetoric reinforce his argument that he understood the implied intentions of the iGreen app ('There wasn't much room for interpretation, it was either are you wasting this much water or are you not'). The text in the excerpt indicates that the quiz questions communicated norms about the disapproval of wasting water, which provides Quinton with a justification for changing his behaviour; he complied with these implicit norms.

Quinton was not atypical; though other participants were not as outspoken, their interview talk suggests that the quiz questions communicated implicit social norms. For example, Ian reported that he uses less water when boiling the kettle now because when taking the quiz he thought: 'I shouldn't be using this much water, this is not the right thing to be doing'. Frank said that he now fills up the kettle with only as much water as needed because the quiz made him realise that 'it was the right thing to do'. The use of phrases such as 'the right thing to do' when participants described how they interpreted the quiz questions suggests that the questions acted as implied injunctions.

A possible interpretation for participants' use of the *discourse of compliance* is an attempt to convince the interviewer that they changed their behaviour for moral reasons in the normative sense. By explaining their new behaviours as 'the right thing to do' or something 'they should do' implies a logical reason for changing their behaviour because it is a taken-for-granted responsibility (Manstead, 2000). If something is considered 'right', it is often not questioned because it is considered socially acceptable. There is no explanation given for why turning lights off more often or boiling the kettle with less water is 'the right thing to do'; it is considered mandatory, and therefore a normatively moral justification that does not require further explanation.

Participants' use of the *discourse of compliance* may also be a way in which to maintain integrity of their rationale for changing their behaviour. As we can see from the previous excerpt, Quinton projects himself as confident and self-assured. Moreover, listening to the recording of the interview gives the impression that he is ridiculing the interviewer's question as he uses a sarcastic and mocking tone of voice. His opening sentence 'Well it was pretty much that what you see is what

you get type scenario, I mean you don't have to be a rocket scientist…' hints at a condescending attitude, which further indicates the ridicule employed in the text. It is possible that Quinton's assertive and candid rhetoric is an attempt to convince the interviewer that he is well-informed about pro-environmental behaviour and 'the right way' in which to behave (suggested by the comments 'what's **right or wrong**' and 'it was either **are you wasting this much water or are you not**'). This is reinforced by his argument that the intention of the iGreen app was clear and obvious ('you **don't have to be a rocket scientist to work out** what this iGreen app is **trying to achieve'**).

The *discourse of compliance* is opposite from the *discourse of ignorance* explained earlier in this chapter (see section 5.1). Rather than claiming a lack of awareness to justify behaviour, Quinton appears to feel the need to present himself as knowledgeable and self-aware. His candid rhetoric implies that the interviewer's question is nonsensical because it should be obvious to the interviewer that Quinton understood the intentions of iGreen. It seems that Quinton felt it necessary to convey to the interviewer that he understood clearly and with certainty the intentions of the iGreen intervention and this is why he changed his behaviour; to comply with the obvious intentions of iGreen and established environmental injunctive norms.

The final example of the use of the *discourse of compliance* is from the interview with Jane. Jane's case is difficult to demonstrate because of the lack of an explicit connection between her changed behaviour and compliance. However, a link between her justification for turning off taps more often and compliance is hinted at in the following quote:

Interviewer:	Why did you change that (turning off the tap whilst brushing your teeth)?
Jane:	I think in this case it was answering the questions, you know, how often do you, it's like, I felt like they were saying you naughty child! You know, in a way, you should be turning the tap off, I know it's something I should not be doing, I should be turning that tap off because… it was a bad habit that I wanted to get out of and [the questions] really pushed me...

The text suggests that Jane was influenced by the quiz questions because they contained an implicit disapproval of her existing behaviour ('I felt like they were saying **you naughty child**!'). The implication here is that the behaviour change was a matter of conforming to an external demand and an associated threat (as suggested by the connotations of the word 'naughty'). This is reinforced in the following sentence by the repeated use of the term 'should' and the use of the second person

to refer to herself ('**you** should'). It is also suggested by the word 'bad' ('bad habit') and 'pushed', which indicate judgement and compulsion.

The use of the *discourse of compliance* allows Jane to justify her new behaviour by representing the behaviour as a social obligation. For example, the use of phrases such as '**you should be** turning the tap off, I know **it's something I should not** be doing' without further explanation indicates that she felt obligated to change the behaviour in order to avoid disapproval of an external source (also indicated by the comment 'you **naughty** child'). Complying with external social pressures in relation to behaving environmentally responsible may be regarded as a logical reason for behaving more environmentally responsible because it is considered a social responsibility. The use of the *discourse of compliance* allows Jane to represent her changed behaviour as something that is not discretionary, which she might assume legitimises her changed behaviour.

Another possible explanation for the use of the *discourse of compliance* here is that Jane assumes it is an appropriate response in an interview about pro-environmental behaviour. It seems that the quiz questions communicated implicit injunctive norms about the behaviours, and therefore Jane assumes that she should conform to these norms ('**I know** it's something **I should not be doing**'). She may have interpreted from the iGreen app and the interviewer's questions that the intention of the research was to encourage more pro-environmental behaviour. Thus, by saying that the quiz questions influenced her behaviour ('[the questions] really pushed me') might be a way to create a favourable impression in the eyes of the interviewer because she assumes that the interviewer wanted iGreen to influence her subsequent behaviour. Jane's interview as a whole is also suggestive of this as she speaks excitedly and enthusiastically about iGreen influencing her behaviour and often refers to the interviewer's approval (e.g. 'you would think I was really good now'). This coincides with her comments in the above excerpt, which relates to judgement and disapproval in regards to her past behaviour.

This section has argued that participants use a *discourse of compliance* in order to justify their changed behaviour. The interview talk suggests that the iGreen quiz questions acted as implicit injunctive social norms that communicated societal approval of particular behaviours. Although the questions did not include the use of explicit injunctive social norms (except for the version of the app that provided social norms feedback), it is apparent that some participants were aware of established injunctive social norms about the behaviours and their talk suggests that they inferred these norms from the quiz questions and this influenced their behaviour.

Cialdini, Reno and Kallgren (1990, also see chapter two) state that a social norm is more likely to mediate behaviour if it is made salient to an individual. In the current study, use of the *discourse of compliance* suggests that the iGreen quiz questions increased the salience of injunctive social norms about pro-environmental behaviour. The implication here is that an environmental quiz could encourage respondents to use a *compliance discourse* because it can communicate established norms about particular behaviours (see chapter seven for detailed discussion).

5.3 The moral discourse

Alongside the *discourse of compliance*, another means by which participants explain the changes in their behaviour is by employing what has been identified as the *moral discourse*. The *moral discourse* is characterised by notions of altruism[1] and guilt.

Participants use the *moral discourse* to justify the adoption of more pro-environmental behaviour during the study. They do so be arguing that they care about the environment because of its relevance for other people, particularly the welfare of children and future generations. These participants also argue that it was guilt about the environmental impact of their earlier behaviours that encouraged them to change their behaviours. Some participants argue that it was guilt and altruism that made them change their behaviour and this causes the author to suggest that the *moral discourse* represents pro-environmental behaviour as a personal moral obligation.

Some participants who use the *moral discourse* also present an environmental presentation of self during the interview. Examples of this are discussed in the first part of this section (5.3.1) along with interpretations of participants' use of the *moral discourse*. Other participants who use the *moral discourse* do not project an environmental presentation of self; possible explanations for their use of the *moral discourse* will be explored in the latter part of this section (5.3.2)

5.3.1 The moral discourse and 'environmental' participants

Some participants who use the *moral discourse* to justify their behaviour argue that they are 'environmental people'. They do not use the *discourse of compliance* (discussed in section 5.2). They seem to want to persuade the researcher that they are not influenced by social obligations, but

[1] In this thesis, the term altruism refers to an individual's motive to increase the welfare of others without a conscious regard for their self-interests (Myers, 2010).

that they changed their behaviours due to personal reasons (such as a result of feeling guilty and being altruistic). The following excerpt from Kelly's interview reflects this perspective:

Interviewer:	Why did you change these things [turning off lights more often and switching off the mobile phone charger when not in use]?
Kelly:	It's because I felt guilty, yeah. Because I know it's important to look after the planet and um, so it's just personal guilt, it's not kind of anything that anyone says to me, it's just personal guilt.
Interviewer:	What do you mean?
Kelly:	Well, I know we should look after our planet because a lot of us are gonna have children and they're gonna have children so I know it's really important to look after the planet for them, um, and like sometimes I have arguments with people about it and they're like, yeah, but I'm not gonna have any children, and it's like, such an ignorant and selfish way of looking at things.

The passage clearly illustrates the use of the *moral discourse*. This is evidenced by the introduction of the term 'guilt' in Kelly's opening sentence. She seems to have felt it necessary to inform the interviewer that her guilt was personal and not concerned with social obligations ('**it's not** kind of **anything that anyone says to me**'). The repeated use of the term 'personal' ('it's just **personal** guilt') and the absence of modality (as suggested by the repeated use of the authoritative term 'I know') also illustrate the subjectivity of the argument. A possible function of this type of talk is to help Kelly to demonstrate that her changed behaviour is intrinsically influenced by her own obligations to behave in a pro-environmental way, rather than social influence.

The second instance in which the *moral discourse* is evident in this passage is in Kelly's reply to the interviewer's question 'what do you mean?' The text is characterised by the notion of responsibility and altruism (as indicated by the statements 'I know **we should look after our planet because a lot of us are gonna have children** ... I know **it's really important to look after the planet for them**'). At the end of the segment, Kelly claims that she argues with people who do not share her views. She speaks assertively and with confidence, which indicates that she is making a truth-claim. Her assertive rhetoric helps to provide a convincing argument that she changed her behaviour during the study because she is concerned about the environment.

The above interpretations describe the use of the *moral discourse* in the text; we will now look at the possible function that the discourse performs in the text. It is possible that Kelly uses the *moral discourse* in this instance in an attempt to maintain the impression she has created of herself as an environmental person. Throughout the interview, she insists that she cares about the environment and reiterates the various environmental activities she engages in ('I recycle, I take public transport

wherever I can and we put like all our tea bags together and we use it as compost in our garden'). Thus, to then say that she had not turned off lights or her phone charger before the study contradicts the environmental presentation of self that she has created in the interview. Kelly may use the *moral discourse* as an attempt at self-repair[1] (Langford, 1994) due to her realisation of this contradiction. The use of self-repair might be a way in which to convince the interviewer that although she had not previously turned off lights and her phone charger, she nevertheless cares about the environment. Use of the *moral discourse* allows Kelly to project herself as altruistic and responsible, which adds credibility to her claim that she is an environmental person who usually behaves in a pro-environmental way. Moreover, the text indicates that behaving environmentally responsible is associated with the nature of the individual. For example, the text presents others who do not behave in environmentally responsible ways in a negative light ('ignorant and selfish'). This presents Kelly in a positive light (i.e. not ignorant and selfish). It also gives the impression that Kelly feels strongly about behaving in an environmentally responsible manner because this is part of her social identity – those who are not environmentally responsible are part of the out-group (see chapter two).

The use of the *moral discourse* is further illustrated by the case of Gemma. Like Kelly, in the interview Gemma creates the impression that she is an environmental person. Gemma said that she turned off taps more often during the study (see chapter four). The following quote is prompted by the interviewer probing Gemma to explain her earlier comment in the interview; that she changed this behaviour because she felt guilty.

Interviewer:	Why did you feel guilty?
Gemma:	I think the guilt thing was not other people looking at my [quiz] answers, but my own guilt, and not being as conscious of doing those sorts of environmental things, so I think, I think it just prompted me that [turning taps off more often] will help make even more of a difference and, as I said, I want to do my bit, you know? I can't just think about myself, you know? It really annoys me when people don't care and think about the future.

In this passage, we again see the notion of guilt used to justify changed behaviour during the study. Like Kelly, Gemma appears to have felt it necessary to state that her guilt is not associated with external factors ('I think the guilt thing was **not other people looking** at my [quiz] answers, **but**

[1] A rhetorical device used to neutralize the negative impact of a word or comment that might be considered inappropriate (see chapter three).

my own guilt'). She also asserts that her guilt was 'her own', suggesting that she is trying to convince the interviewer that she changed her behaviour due to personal moral obligations.

Later in the excerpt, there is a shift from the *moral discourse* to the *discourse of ignorance* (discussed in section 5.1 of this chapter). Gemma argues that her guilt was concerned with not having been previously aware of the environmental impacts of some of her earlier behaviours ('not being as conscious of doing those sorts of environmental things'). The implication here is that her previous behaviours had been a result of ignorance and, as suggested earlier in this chapter, ignorance is usually considered more acceptable than, for example, a lack of concern for the environment. The function of the *discourse of ignorance* here might be to counter the assumption that she should have been behaving more environmentally prior to the study, particularly because it contradicts the environmental presentation of self that she has created in the interview.

A number of phrases in the passage indicate that Gemma justifies her behaviour changes by presenting herself as an environmental person. For example, the phrases '**as I said**, I want to do my bit' and 'something like that will help make **even more** of a difference' suggest that she is reminding the interviewer that she is a responsible person who is willing to take action to reduce her environmental impact. The phrase 'makes **even more** of a difference' implies that she had behaved pro-environmentally before the intervention and again creates an environmental presentation of self.

The excerpt also indicates that Gemma is arguing that she adopted more pro-environmental behaviour because of its relevance to other people; particularly future generations ('I **can't just think about myself** you know? It really annoys me when people don't care and **think about the future'**). The notion of altruism here further represents Gemma as an environmentally responsible person. She seems to be saying that she is aware of the consequences of not behaving in environmentally sustainable ways and is willing to take action in order to reduce the threats posed to future generations.

There are a number of possible explanations for the use of the *moral discourse.* To address these explanations, we must reflect on the possible rhetorical aims of Kelly and Gemma in the interviews and the potential role played by the *moral discourse* in accomplishing these aims. The next part of this section offers some explanations.

It is possible that the context of this study encouraged some participants to use a *moral discourse* in order to display an environmental social identity. Language can be used to build a particular type of identity (Gee, 2011a, see chapter three). One explanation for participants' use of the *moral discourse* is because this discourse can create a socially recognisable and acceptable identity within a study about environmental behaviour. Kelly and Gemma seem to identify themselves with environmental people and use negative connotations when referring to people who are not environmentally concerned. For example, Kelly's claim that she argues with people who do not share the same views as her about caring for future generations sets herself apart from people who are unconcerned about the future (by labelling them 'ignorant and selfish'). Gemma similarly does this as she says 'it **really annoys me when people don't care** and think about the future'. Kelly and Gemma's distinctions between environmental people and less environmental people may be concerned with the type of social group they feel they belong to (Tajfel and Turner, 1986). People make distinctions between who they identify with (the in-group) and those who they do not identify with (the out-group) based on their social identity. Kelly and Gemma's interview talk implies that they felt it necessary to show that they identify with people who are concerned about the environment. Due to the environmental context of this research, it is logical to assume that the interviewer is concerned with environmental issues, and therefore these participants may have felt inclined to show that they share similar views by presenting an environmental social identity.

The use of the *moral discourse* can be interpreted in line with norm activation theory[1], which relates to personal norms (Schwartz, 1964). Norm activation theory states that pro-environmental behaviour occurs in response to an *activation* of personal norms. According to the theory, personal norms are activated in people who are concerned about the deleterious effects of the environment, and this activation of personal norms encourages people to behave in pro-environmental ways. It is possible that Kelly and Gemma use the *moral discourse* in order to convince the interviewer that they adopted more pro-environmental behaviour because they have personal norms about the environment. For example, the interview talk discussed in this section suggests that these participants changed their behaviour because completing the quiz activated their personal norms (about having a concern for the environment) and, as a result, felt guilty for not doing particular behaviours. This is explained further in chapter seven.

[1] See chapter two for a detailed discussion on norm activation theory

5.3.2 Alternative use of the moral discourse

In contrast to the participants described in the previous section, other participants who use the *moral discourse* do not present an environmental social identity. For example, Mike also uses the *moral discourse* to justify his changed behaviour but does not create the impression that he has an environmental social identity during the interview. The following passage evidences Mike's use of the *moral discourse* and illustrates a different way in which it is used:

Interviewer:	You said you changed [your behaviour] because of guilt?
Mike:	Uh, yeah.
Interviewer:	Hmm. Could you explain that? I mean, why you felt guilty?
Mike:	Um, I guess because in essence it's our world and we have to look after it... because I know from the studies that the effects might not necessarily harm us but maybe our children and our children's children and I guess you have to be a bit responsible and think about the future, you know?

The first point to notice about this excerpt is that it is characterised by modalised speech forms. Mike uses terms such as 'I guess', 'might not', 'a bit' and the tag-question 'you know', which all indicate a reduced commitment to the views being expressed. The modalised speech suggests that Mike is attempting to provide a suitable justification for his earlier comment about changing his behaviour because he felt guilty, but he is uncertain with the reasons he expresses here.

The use of legitimation (the reference to 'studies') further indicates a reduced commitment to the veracity of the statement. The reference to 'studies' removes accountability from the individual and focuses attention on what is likely to be considered a more credible source (where a credible source can be defined as study based evidence). Mike may be using legitimation because it adds integrity to his explanation, and the interviewer may be more likely to accept his answer because it establishes the authority of his claim.

In contrast to the examples discussed earlier in this section (from the interviews with Kelly and Gemma), the use of the *moral discourse* here is less assertive. It seems that the views being expressed by Mike are not entirely personal, suggested by the use of possessive pronouns ('it's **our** world'; '**our** children'), and his use of plural pronouns '**we** have to look after it' and '**you have to** be a bit responsible' instead of the subjective term 'I'. Apart from the use of legitimation ('I know from **the studies** that the effects might not necessarily harm us'), the text lacks assertiveness and provides a less convincing justification for Mike's behaviour change.

Unlike Kelly and Gemma, Mike does not seem concerned with projecting an environmental social identity in the interview. During his interview, he explicitly says that the convenience of his actions is more important to him than his environmental impact. His apparent lack of concern for the environment contradicts his justification for changing his behaviour here (to look after the environment because of his concern for future generations). It is likely that Mike felt it appropriate to use a *moral discourse* to justify his behaviour because it is an acceptable and taken-for-granted rationale due to the environmental context of this study.

The next passage from the interview with Krish similarly illustrates the use of the *moral discourse* in an uncertain way. The quote is Krish's reply when asked by the interviewer why he felt guilty for leaving the television switched on:

> Krish: I suppose… we gotta think about the future, my kids and their kids, and you know, so, you're just looking long term really so I'll do my bit now, why not?

During the interview, Krish did not present himself as an environmental person or as someone who is concerned about his environmental impact, which is in line with his tentative use of the *moral discourse* here. This excerpt, like the passage from Mike's interview, is characterised by modalised speech and hesitation. The modalised utterances ('I suppose') and the use of tag-questions ('you know'; 'why not?') indicate the uncertain nature of the talk. There is an absence of assertiveness and the text does not provide a convincing argument that he changed his behaviour due to the altruistic reasons as the text implies ('we gotta think about the future, my kids and their kids'). It is possible that Krish uses the *moral discourse* here because it is considered an acceptable and desirable justification for changing his behaviour in this research, rather than it being a true explanation for his behaviour change.

Earlier in this chapter (section 5.1), it was shown that Krish uses the *discourse of ignorance* to justify his behaviour changes. It was suggested that although he was aware of the importance of environmental protection, he had not been aware of his own wastefulness. This apparent lack of awareness of his own wastefulness delegitimizes the idea that he changed his behaviour due to altruistic reasons. Furthermore, in chapter four, we saw Krish use the *too green discourse* to justify why he would not adopt particular environmental behaviours and he also objectified environmentalists in a negative light. His negative point of view about environmentalists that he had expressed is inconsistent with the views expressed in the above quote. His use of the *too green*

discourse invalidates the idea that he changed his behaviour because of guilt or altruistic concerns, by constructing some pro-environmental behaviours as negative and not normal.

Once again, it is important to consider the potential explanations for the use of the *moral discourse* and to look at what function it might perform in the text. It is possible that some participants use the *moral discourse* in an attempt to create a positive presentation of self in the presence of the interviewer due to the environmental context of the research. For instance, participants who use the *moral discourse* argue that their behaviour change is concerned with the welfare of children and future generations. This creates the impression that they are unselfish and responsible people who are willing to take action for the benefit of others. Hence, the *moral discourse* may be used to create a favourable presentation of self in the eyes of the interviewer.

5.4 Chapter summary

In this chapter, evidence was presented of the existence of three discourses. Each discourse underpins participants' justifications for changing behaviours during the study.

It was suggested that the first discourse, the *discourse of ignorance*, allowed participants to counter the assumption that they should have been behaving more environmentally sustainably before the intervention. It was argued that people are likely to claim ignorance to justify their behaviours because it tends to be considered more acceptable than other attitudes, such as a lack of concern for the environment. Use of this discourse suggests that answering the iGreen quiz questions may have increased the salience of participants' own behaviours and encouraged them to rethink and reconsider these behaviours.

In the *discourse of compliance*, the adoption of more pro-environmental behaviour was represented as a social obligation. Use of this discourse implied that participants understood implicit injunctive norms embedded in the quiz questions; and taking the quiz increased the salience of these norms. The interview talk suggested that participants legitimated their changed behaviour by claiming that they complied with these implicit societal norms.

Finally, there was the *moral discourse*. The *moral discourse* is characterised by notions of altruism and guilt. The fact that participants argued that it was guilt and altruism that influenced their behaviour change indicates that the *moral discourse* represents pro-environmental behaviour as a personal moral obligation. The interview talk suggested that some participants who used the *moral*

discourse to justify their changed behaviour did so in order to present that they have an environmental social identity or a more socially desirable presentation of self. It was also argued that the way in which some participants justified their changed behaviour as a result of feeling guilty could be interpreted in line with norm activation theory. This will be discussed further in chapter seven.

Identification of these three discourses illustrate the rhetorical devices participants employ in an attempt to explain why they changed their behaviour because of an intervention, as well as to justify why they had not behaved in an environmentally sustainable manner prior to the intervention. Examining the possible rhetorical functions of the discourses provide a rich understanding of why the intervention may have encouraged participants to change their behaviours and the meanings that underpin participants' justifications. For example, the *discourse of ignorance* represents participants' claims to a lack of awareness of their previous behaviours prior to the iGreen intervention, and this provides a socially acceptable justification for their previous behaviour. In the *discourse of compliance*, pro-environmental behaviour change is represented as a social obligation and this legitimises participants' behaviour change. Alternatively, representing pro-environmental behaviour change as a moral obligation, as in the *moral discourse*, is, it is argued, considered more socially desirable and provides participants with a positive presentation of self. The use of a discourse analysis approach and examination of some of the linguistic techniques employed by participants in this chapter shows how the researcher's interpretations of the interview talk were constructed and to consider the possible role of the talk in accomplishing different aims.

The next chapter (chapter six) considers the differences between the three intervention groups. As stated in chapter four, there were no apparent differences between the groups' quiz answers and claimed behaviour change. However, there were differences in the discourses they employed to justify why particular aspects of the iGreen intervention encouraged their behaviour change. The chapter also looks at the discourses used by participants to explain the impact of the personalised individual feedback and the social norms feedback on their behaviour. This provides an in-depth insight into why a social norms intervention may, and may not, encourage pro-environmental behaviour change.

6.0 Behaviour change: discourses used by the different groups

This is the third and final chapter that presents the findings of this research. The previous chapter discussed the discourses that participants used to justify the behaviours they changed because of using iGreen. This chapter continues to discuss the discourses used by participants to explain their behaviour change but distinguishes between the different discourses used by the three intervention groups.

As explained in chapter three, participants who downloaded iGreen were randomly allocated to one of three intervention groups. Participants were either in a group in which no feedback was provided, a group in which they received feedback about their own quiz answers (personalised individual feedback), or a group in which feedback also included the average quiz answer of other iGreen users (the social norms feedback).

The quiz, questionnaire and interview data were analysed to compare the impact of individual feedback, a combination of individual and social norms feedback, and no feedback. One of the aims of comparing three groups was to see whether there were any differences in the changes that occur when people are provided with feedback with those who receive no feedback, as well as to explore the impact of individual and social norms feedback.

There were no differences in quiz answers given by participants in the three intervention groups. The lack of any difference suggests that the feedback may not have had an additional impact on participants' behaviour. The Kruskal-Wallis test was used to analyse whether there were any statistically significant differences between the three groups' quiz answers. Table 6.1 shows the significance levels for differences between the three groups' quiz answers. The example in the table is participants' answers to the question: *last week, how often did you turn off the tap whilst brushing your teeth?* In chapter four, it was shown that there were significant changes in participants' quiz answers for this question over the seven weeks. However, as indicated by the table below, there was no statistical evidence for differences between the three groups' quiz answers for this question (significant if $p < 0.05$).

Table 6.1 Kruskal-Wallis significance levels for differences between the three groups quiz answers across seven weeks for one question

	Sig. level (*p-value*) of difference between the three groups quiz answers						
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Last week, how often did you turn off the tap whilst brushing your teeth?	0.20	0.83	0.98	0.91	0.62	0.49	0.16

N= 51

Similarly, there was also no statistical evidence for differences between the three groups' quiz answers for any of the other fourteen iGreen quiz questions. As no significant differences between the groups' quiz answers were found, post hoc tests were not carried out[1]. However, the post-intervention questionnaire and the interviews indicate differences between participants in the three group's explanations for changing their behaviour. Participants in each group tended to use different discourses to explain their behaviour change. This chapter examines these discourses.

In the previous chapter, a number of discourses were identified that were used by participants across all of the intervention groups. Participants used some of those discourses to justify their behaviour change. The current chapter also looks at discourses participants use in discussions about their behaviour change but introduces some new discourses identified in the interview transcripts, which were used only by participants in particular intervention groups. For instance, participants in the no feedback group used a *games discourse,* whereas this discourse was absent in participants' talk in the two feedback groups. The *games discourse* is discussed in section 6.1.

It was clear from the interviews that participants in the two feedback groups noted and engaged with the personalised individual feedback and the social norms feedback. Participants in both feedback groups claimed that the personalised individual feedback encouraged them to change their behaviour. In the post-intervention questionnaire, 94% of those in the personalised individual feedback group and 83% of those in the social norms feedback group agreed with the statement that they changed their behaviour because of the *personalised individual feedback*. In the interviews, some participants used a *competition discourse* to justify why the personalised individual feedback encouraged them to change their behaviour. This is discussed in section 6.2.

[1] See chapter three: section 3.4

Other participants used a *moral discourse* to argue that the personalised individual feedback influenced them to change their behaviour. The *moral discourse* was introduced in the previous chapter but it was used more generally in participants' talk about how iGreen affected their behaviour. Some participants said that they changed their behaviour because answering the quiz questions produced negative feelings of guilt about their behaviour. However, participants' talk concerning their response to the personalised individual feedback indicates the use of a positively connoted *moral discourse*. Here, participants' claim that the personalised individual feedback encouraged them to change their behaviour because it made them feel rewarded. This is discussed in section 6.3.

The final section of this chapter (6.4) focuses on discourses used by participants in the social norms feedback group. Participants in the social norms feedback group tend to argue that the social norms feedback had no impact on their behaviour. However, two participants said that it did influence their behaviour. In both cases, participants use an *in-group* discourse to justify their claims. The arguments articulated suggest that it is reasonable to conform with group norms if they are related to a relevant reference group. Section 6.4 explores the varied use of the *in-group discourse* and also discusses possible implications of the use of this discourse. The post-intervention questionnaire data will also be discussed where relevant to further illustrate the differences between the three intervention groups.

6.1 The no feedback group and the games discourse

This section introduces a discourse concerning the iGreen games: the *games discourse*. There were seven sustainability themed games included in iGreen. Initially the games were included as part of the app as an incentive for completing the quiz, and it was not envisaged that participants' interview talk would concern the games when discussing their behaviour change. However, participants who did not receive any individual or social norms feedback (the no feedback group) draw on a *games discourse,* which characterises the iGreen games as educational and able to encourage more pro-environmental behaviour by learning through play.

This research suggests that participants in the no feedback group changed their behaviour as much as participants in the two feedback groups. This differs from some of the social norms research (see chapter two) which posits that compared with a control group (participants who receive no personalised or social norms feedback), participants who do receive feedback are more likely to change their behaviour (LaBrie *et al.* 2006; 2008). However, the current study indicates that there

were no differences between the no feedback group and the two feedback groups' behaviour change following the intervention. No feedback group participants use a *games discourse* to explain their behaviour change. In the post-intervention questionnaire, 85% of no feedback group participants agreed with the statement that they changed their behaviours because of the iGreen games, whereas no participants in the feedback groups agreed with this statement. No feedback group participants also agreed with the statement that the games made them more aware of the environmental implications of their behaviour, but only 12% of personalised individual feedback participants and no participants in the social norms feedback group agreed with this statement.

The interviews are consistent with the questionnaire data as no feedback group participants spontaneously brought up the games as influencing their behaviour. An excerpt from the interview with Chris illustrates this. The excerpt is Chris' response to the interviewer who asked him to explain why he thought he recycled more now because of using iGreen:

Interviewer:	So why did you start recycling more?
Chris:	…Uhhh... Just from interacting with the whole application itself… **Especially when I was playing those games!**[1] I liked playing those games and there was one, I think you have to throw the right rubbish in the right bin, or something like that, so… it sounds stupid, but I created a little system at home. Now I have clear Asda bags for some plastic rubbish, then I have another colour one for like cardboard stuff... I think it is just ridiculous because this iGreen thing is just making me do it, you know... it became a game in real life that I learnt through the application, you know.

The beginning of the passage is characterised by hesitation and modalised speech forms. This modality is indicated by the long pause before responding and the subsequent vague reply: '… Uhhh...Just from interacting with the whole application itself'. The hesitation suggests an uncertain commitment to the veracity of this utterance. Chris then seems to have a specific answer he can put forward: '**Especially when I was playing those games!**' The change in his tone of voice (which is raised and has an enthusiastic intonation) and use of the adverb at the start of the sentence ('Especially') shows that he has an argument he can present with confidence – the argument that it was the games that made him recycle more. His talk suggests excitement and it is notable that he represents his experience of the games in a positive manner ('I liked playing those games').

[1] Bold text within quotes illustrates participant's emphasis. Chris raised his voice and spoke in an animated manner.

The text makes an explicit connection between his behaviour change and the games ('I created a little system at home'; 'this iGreen thing is just making me do it'). Although Chris claims that the concept of one of the iGreen games influenced him to recycle more, he seems to do so reluctantly. After describing the recycling game, the modality of his talk then changes again and the hesitation returns. The discourse now has a negative connotation ('it **sounds stupid**[1], but I created a little system at home'; I think **it is just ridiculous** because this iGreen thing is just making me do it'). He intersperses his talk with pauses and uses the tag-question 'you know?' This indicates a reduced commitment for the views being expressed. The sudden and drastic change from a positive and enthusiastic discourse to a negative one illustrates Chris' discomfort with the explanation.

The modality of the text reflects Chris' lack of confidence in his explanation. His apparent discomfort may be because his explanation (that the games influenced him to recycle more) indicates that he was manipulated by the app and influenced by the games. Indicating that the games influenced his behaviour may be considered frivolous and trivial, and therefore his acknowledgment that this is illogical (as he says: 'it sounds stupid' and 'ridiculous') may be an attempt at self-repair. Acknowledging that his explanation for recycling more – because the games made him - is knowingly irrational, invites the interviewer to excuse the illogicality (Langford, 1994).

The latter part of the excerpt appears to be an attempt at maintaining integrity of his rationale for being influenced by the games. This is demonstrated in the last line of the quote ('it became a game in real life that I learnt through the application, you know') as the term 'real life' suggests that he distinguishes between the games and reality and this adds integrity to his explanation. Rather than simply being influenced by the games, Chris asserts that he 'learnt' through the application, which is likely to be considered less superficial than being influenced by games alone.

Other participants in the no feedback group use the *games discourse* like Chris. Central to their argument is that being influenced by the games to change their behaviour is justified because they are learning through play. A passage from the interview with Helen illustrates this:

Interviewer:	Ok, what did you make of iGreen, the application?
Helen:	That was cool, it was fun... the different little scenarios it was good 'cos they made me see and do things differently, you know, so you're learning something at the same time.

[1] Bold text in main body always illustrates author's emphasis unless otherwise stated.

Interviewer:	What do you mean by that?
Helen:	Um… oh gosh... ummm...I'm trying to remember… remember the little game when you had the truck and you had to move from side to side?
Interviewer:	Yeah.
Helen:	Some things that I thought were recyclable would then appear and you know, then it would minus points, you're like oh wow you can't recycle those kind of things! And I was like oh I should stop putting them in the recycle bin then!
Interviewer:	Ok, like what? What kind of things?
Helen:	Like the… the burger container, it wasn't recyclable but I thought it would've been.
Interviewer:	Oh, because its food contaminated.
Helen:	Yeah, so I thought it would've been but it wasn't, so now I don't put the burger containers in the recycling, you know, and that game taught me that.

The *games discourse* is introduced at the very start of the passage. Helen's use of the *games discourse* suggests that the games influenced her behaviour ('they made me see and do things differently'). When probed by the interviewer for further explanation of her claim, Helen seems perplexed and anxious by the question. The long pauses, use of terms 'um' and 'oh gosh' indicate hesitation and uncertainty. Furthermore, the phrase 'I'm trying to remember' fills the silence and conveys that she has simply forgotten, rather than she does not know what to say. Helen then recalls a game that she is able to describe and explains that it made her realise that she cannot recycle particular items. It is notable that she represents her experience in an enthusiastic and animated manner, indicated by her raised pitch of voice and the rapidity in which she presents the utterance.

In the last sentence, Helen is able to provide a clear example of how the games made her change her behaviour ('so now I don't put the burger containers in the recycling, you know, and that game taught me that'). Her confident tone of voice and matter-of-fact rhetoric provides a more convincing argument that the games influenced her behaviour. Moreover, describing the games as educational ('you're learning something at the same time' and 'that game taught me that') makes her claim more credible. Like Chris in the previous quote, Helen seems concerned with presenting her claim - that the games influenced her behaviour – as less trivial.

It is apparent that participants found it difficult to explain why the games had an impact on their behaviour. This may be because games are related to play and fun and perhaps not considered serious; therefore illogical to influence one's behaviour. An interpretation of the above examples is that participants in the no feedback group may have felt that they should say the games influenced their behaviour due to the environmental theme of the games. Moreover, no feedback group participants did not receive any feedback and may have assumed that the purpose of the research

was to be influenced by all elements of iGreen that they were exposed to (the quiz *and* the games). This may be why participants in the other groups do not use a *games discourse* to justify their behaviour change. For instance, participants in the other groups received feedback about their behaviour, which may be considered a more acceptable explanation for changing their behaviour. Feedback is perhaps considered less frivolous and more in line with the nature of research. Therefore, participants in the feedback groups were able to use other more *scientific discourses* to justify why iGreen affected their behaviour that were not available to those in the no feedback group (Tversky and Kahneman, 1973). The discourses used by participants in the two feedback groups are discussed in the remainder of this chapter.

6.2 The individual feedback and the competition discourse

This section discusses the *competition discourse*. This discourse is characterised by notions of competitiveness, winning and striving to excel. Within this discourse, notions of competition and winning are not used in the conventional sense (e.g. competing against other people or a team). Instead, participants' references to competition concerns surpassing their own score (the personalised individual feedback) in the iGreen quiz and winning is about excelling in the quiz. It seems that participants' used the personalised individual feedback as a means to challenge themselves.

Participants in the two feedback groups make use of the *competition discourse* to justify why the personalised individual feedback had an impact on their behaviour. Previous research (see chapter one) suggests that social norms feedback can cause competitiveness (Foster *et al.* 2009); therefore it was surprising that participants claimed that they competed with the personalised individual feedback instead. The way in which some participants in both feedback groups' describe the personalised individual feedback in a competitive manner causes the researcher to suggest that it encourages a *competition discourse*.

The *competition discourse* came up on a number of occasions during interviews. The most explicit example of these is quoted here:

Interviewer:	Were you thinking about the questions in between the quizzes?
Oswald:	Yeah, I'd do something and think **ha![1] I turned off that switch at the wall, I can put that in my next survey!** Once I answered a survey one week, I'd think let me try and be beat my answer the following week, and if I came back and I'd even made a conscious effort and it was actually worse than my previous answer, I felt a little bit disappointed, you know, 'cos it shows you with that little arrow.
Interviewer:	Oh really? Why?
Oswald:	Because I try to be the best man that I can be.
Interviewer:	So even though you said that you're not that concerned about the environment, why did you still want to be better in this?
Oswald:	For me, it's not so much the cause, you know, it's not what I'm doing, but for me, I'm winning! I am quite egotistical and competitive and it was like a competition... it was like a challenge, yeah, it was a challenge and I like challenges and challenging myself everyday and keep myself in a certain way and win at challenges, yeah, that's what it was.

This quote clearly indicates a link between competition and the personalised individual feedback. Firstly, Oswald describes his reaction to the personalised individual feedback: 'ha! I turned off that switch at the wall, I can put that in my next survey!' The emphatic stress[2] on this utterance indicates triumph and pride. Secondly, Oswald explains that he would try to 'beat' his answer and that if the personalised individual feedback showed that his answer was 'worse' he would feel disappointed. This description of how he felt when completing the quiz illustrates his competitive disposition in regards to the personalised individual feedback. The *competition discourse* is used again by Oswald when he asserts that winning is more relevant to him than the environmental cause and that iGreen was similar to a competition ('for me, it's not so much the cause [...] but for me I'm winning!'). His frequent use of the term 'challenge' when referring to the iGreen quiz again indicates the competitive nature of his talk.

Taking a detailed look at the remainder of the interview with Oswald, it seems that Oswald attempts to present himself as overtly masculine. The use of a *competition discourse* in the above passage also seems to be an element of a projection of masculinity[3]. This is evidenced by his assertion 'Because I try to be the **best man** that I can be' when asked by the interviewer why he had been disappointed when his quiz answers were worse. Oswald asserts that he is 'egotistical and competitive' in response to the interviewer's attempts to find out why he wanted to improve his behaviour despite having said earlier in the interview that he was not concerned about

[1] Participant's emphasis: Oswald's voice is louder in pitch and his tone changes
[2] Dramatic change of pitch (Gee, 2011b, p.34, also see chapter three).
[3] Masculinity refers to normative beliefs of how men are expected to behave and feel (Fox and Tang, 2014 p.315).

environmental issues. It seems unconventional for an individual to describe himself as egotistical because the term is generally negatively connoted, yet Oswald's intonation contour (Gee, 2011b) conveys arrogance and confidence. He also states that he is not concerned about the environment or the consequences of his actions, which could be considered bold in an interview about environmental behaviour. An explanation for his bold and out-spoken discourse is to present himself as a masculine, independent and self-determining man in the presence of the interviewer.

The *competition discourse*, it seems, is closely articulated with a discourse of masculinity. In this masculine discourse, a 'man' is someone who welcomes challenge, aims high in all his endeavours (to be the 'best') and resists compliance. Masculinity is usually associated with competitiveness and self-reliance (Fox and Tang, 2014). Oswald frequently informs the interviewer that he partakes in competitive activities ('I'm really active and I play football and lots of sport, you know... I also go to the gym regularly so I'm a pretty fit guy'). He boldly asserts that he did not change his behaviour during the study because of the environmental context, but for other concerns such as competing with the personalised individual feedback or to save money ('I don't really care about my impact, it's more about saving money rather than saving the planet. I work hard for my money so I'm not gonna waste it'). He seems to feel it necessary to inform the interviewer that he is hard-working and uninfluenced by external concerns (such as his environmental impact), which further hints at a masculine projection of self and possession of agency; he is active and self-motivated.

The second example of the use of the *competition discourse* is from the interview with Brenda. It was briefly addressed earlier in this section that, contrary to expectations, participants in the social norms feedback group said that they competed with the personalised individual feedback rather than social norms feedback. For example, Brenda in the social norms feedback group too claims that she only competed with the personalised individual feedback. This is illustrated in the following excerpt:

Interviewer:	So you said you noticed the feedback then- the information about your previous answer?
Brenda:	Yeah, I was really comparing myself to myself, you know, and competing with it, like competing with myself, just because the other people [the social norms feedback], I was kinda like, well I don't really know what they're doing, I can't control that... but if I was much worse than my last answer then it would make me feel like, you know, like I'm getting worse and then I have to beat it you know, but yeah, I was competing on a couple of things I knew I had to improve myself in.

The key event in this passage is Brenda's assertion that she competed with 'herself', which clearly illustrates a link between the personalised individual feedback and competitiveness. She spontaneously dismisses the social norms feedback ('the other people [the social norms feedback], I was kinda like, well I don't really know what they're doing, I can't control that'), which adds credibility to her claim that she was competing with the personalised individual feedback and not the social norms feedback. She describes not having control over what other people do, suggesting that her competitiveness is concerned with striving towards an individual goal rather than for a social comparison. This provides Brenda with a plausible explanation for dismissing the social norms feedback; because she is a self-governing individual who wanted to improve her own answers and/or behaviour.

This independent presentation of self is consistent with the remainder of Brenda's interview. Earlier in the interview, Brenda uses terms that suggest that she is a competitive person who strives to succeed in her professional and social life ('I have a first degree and I've been offered jobs from two top companies, you know. I'm the one that always tells my friends to work harder so we can go on good holidays and eat at nice places'). This description of herself is in line with the competitive attitude that she displays in the above passage, suggested by her assertions: 'I **have to beat**[1] it' and ', I was **competing** on a couple of things **I knew I had to improve myself** in'. The use of the *competition discourse* appears to be a way in which to present an ambitious and independent persona, perhaps in an attempt to impress the interviewer.

The passage here, like the one from the interview with Oswald, illustrates the overall interview as a means to create a particular type of impression; one that is competitive, independent and ambitious. Another characteristic that is shared by participants who use the *competition discourse* is the absence of the use of discourses such as moral or compliance, which we saw other participants use in the previous chapter. This further indicates that the *competition discourse* may be used by those who feel it necessary to present an individual and independent presentation of self, as they do not use discourses that depict them as influenced by external factors (i.e. other people, the environment, the context of the research). The above examples indicate that interview questions about the personalised individual feedback encouraged participants to project a competitive presentation of self: masculinity in Oswald's case and independence in Brenda's case. Their talk

[1] Bold text in main body always illustrates author's emphasis unless otherwise stated

indicates that the personalised individual feedback may have encouraged participants to use a *competition discourse*.

Oswald and Brenda's talk creates the impression that they reject prevailing norms about pro-environmental behaviour. They seem to go against the conventions in an interview about pro-environmental behaviour by arguing that their behaviour change is concerned with self-interest and egotistical reasons rather than altruism. Their apparent rejection of generally held environmental norms nevertheless indicates that they are behaving consistently with other norms; masculine norms in Oswald's case and independence in Brenda's case (Sunstein, 1996; Fox and Tang, 2014).

Participants who do not adopt the *competition discourse* seem to attempt to manage the relationship with the interviewer by using normatively appropriate discourses to justify their behaviour change. For example, they use a *moral discourse,* which presents them in a more positive light. This is discussed in the next section.

6.3 The individual feedback and the moral discourse

The previous section argued that some participants use a *competition discourse* to justify why the personalised individual feedback affected their behaviour. The current section discusses an alternative discourse used by participants to explain why the personalised individual feedback had an impact on their behaviour; the *moral discourse*. Within the *moral discourse,* personalised individual feedback is also characterised as a means to assess improvement. However, rather than representing the personalised individual feedback as a means to assess self-improvement, the *moral discourse* represents it as a means to assess improvement of behaviour for social benefits (i.e. the 'good of the environment').

The *moral discourse* was introduced in chapter five and it was explained that the discourse is characterised by notions of altruism. In chapter five, participants' interview talk indicated that it was guilt about the environmental impacts of their earlier behaviours that encouraged them to change their behaviours. Therefore, participants used a negatively connoted *moral discourse*, and said that they changed their behaviour as a result of iGreen producing negative feelings (guilt) and making participants feel bad.

In this chapter, it is argued that the *moral discourse* is used by participants to justify why the personalised individual feedback affected their behaviour. However, the *moral discourse* used by

these participants is characterised by positive rather than negative emotions. Participants in both feedback groups use a *moral discourse* to explain that the personalised individual feedback encouraged them to adopt more pro-environmental behaviour because it indicated that they were contributing to the welfare of the environment (altruism) and this produced positive feelings (such as 'feeling good' and 'rewarded').

An example of the positive use of the *moral discourse* is illustrated in the following passage from the interview with Joshua. Joshua was in the personalised individual feedback group and he uses a *moral discourse* to justify why the personalised individual feedback influenced his behaviour:

Interviewer:	Hmmm. Why has [your behaviour] only changed now?
Joshua:	I feel like until this survey, I'm very nonchalant about the messages that I receive, so the fact that you see your answers the week before, it shows whether the message is getting through or whether your habits are changing and… I was playing the games after and I don't feel like just playing the game is enough reward for this, I'd forgotten about the prizes at that stage, and I felt like the real reward for me would be to make a contribution, a conscious effort, so the fact that I could see my answers get better was rewarding 'cos I knew I was making a difference.

At the beginning of the quote, Joshua says that the iGreen quiz influenced his behaviour, whereas other environmental messages had not. This is in line with the literature discussed in chapters one and two which indicate that some environmental information based initiatives are largely ineffective (Kollmuss and Agyeman, 2002; Lorenzoni, Nicholson-Cole and Whitmarsh, 2007; Kinzig *et al.* 2013). Without being prompted, Joshua brings up the personalised individual feedback as an explanation for changing his behaviour ('the fact that **you see your answers the week before, it shows whether the message is getting through[1]...'**). He then goes on to describe the aspects of iGreen that did not influence his behaviour (the games and prizes) because they were not rewarding. In this latter part of the passage, the *moral discourse* is introduced ('**the fact that** I could see my answers get better was rewarding 'cos **I knew I was making a difference**'). The terms 'make a contribution' and 'make a difference' all hint at a *moral discourse* to justify why the personalised individual feedback made him change his behaviour.

There are a number of possible explanations for Joshua's use of the *moral discourse* here. Firstly, the use of the discourse may be a way in which to counter the assumption that he does not care

[1] Bold text in main body always illustrates author's emphasis unless otherwise stated

about the environment. The interviewer's direct question implies that he should have been doing particular behaviours before the study and perhaps been more concerned about the impact of his behaviour. Therefore, Joshua may have felt it necessary to provide an explanation for not behaving environmentally sustainably prior to the study. Using the *moral discourse* indicates that he is aware of the importance of behaving environmentally ('to make a difference'), and presents him as socially responsible.

Joshua claims that seeing his answers improve (via the personalised individual feedback) felt rewarding because he knew he was making a difference. As the personalised individual feedback is a specific feature of iGreen, it provides a plausible justification for not behaving as environmentally sustainably before using iGreen. This is because, as he claims, 'other messages' did not provide feedback about his actions or indicate that he was making a contribution. In other words, using a *moral discourse* to justify why the personalised individual feedback encouraged him to behave more environmentally sustainably provides Joshua with a more logical and acceptable justification for not behaving environmentally sustainably before the study. Furthermore, it suggests that the lack of success of previous environmental initiatives may have been partly because they do not prompt people to consider their own impact on the environment.

It is possible that the rhetorical aim of using the *moral discourse* is to provide a convincing argument that the personalised individual feedback encouraged Joshua to change his behaviour because it was credible information related to his own actions. His dismissal of other aspects of the iGreen app (the games and prizes) influencing his behaviour may be because they seem frivolous and he is concerned with demonstrating that he was instead influenced by a more reliable and more *scientific* aspect of iGreen (the personalised individual feedback).

Nick (in the personalised individual feedback group) also uses the *moral discourse* to justify why the personalised individual feedback encouraged him to change his behaviour. In the interview he said that the feedback had an effect on his behaviour, and below is his reply to the interviewer's prompt to explain this earlier comment:

Interviewer:	Ok. Why do you think the [individual] feedback had an effect [on your behaviour]?
Nick:	It was good in that it was actually having a knock on effect in what I was doing and it was improving my behaviour in terms of being more aware of doing stuff like turning taps off, or lights off, or turning the PC off more. So in that respect I felt like I'd made an achievement because I've

	done something about it if my answer wasn't as good last week compared to this week and I've been actively, been more pro-active in terms of doing that, whereas before [using iGreen] I wouldn't have.
Interviewer:	What do you mean it's an achievement?
Nick:	It's an achievement because **you're improving**,[1] it's not that you're not doing anything about it, then it's **not** an achievement and then you're **not** making a difference.

Compared to participants who use the *competition discourse* (see section 6.2) Nick's concern with improvement does not appear to be related to competitiveness or ambition. Instead, Nick's discourse concerns altruism. Although he describes seeing his answers improve as an 'achievement', he describes this in relation to improving to 'make a difference' rather than for self-interests. His use of phrases such as 'if my answer wasn't as good last week compared to this week; 'I've been actively, been more pro-active' could be interpreted as a description of competition, but his intonation contour suggests that he is trying to convey an altruistic attitude. His assertiveness suggests that he is arguing that he changed his behaviour for an external cause rather than for self-interested implications. This is made explicit at the end of the quote in which Nick says 'it's not that you're not doing anything about it, then it's **not** an achievement and then you're **not** making a difference.' This utterance explicitly links improvement in his behaviour to altruism.

Nick's apparent concern with projecting an altruistic presentation of self is consistent with the remainder of his interview. In chapter five, it was argued that Nick uses the *discourse* of *ignorance* to present a more socially desirable presentation of self. He justified behaving less environmentally sustainably before the study by arguing that he had not been previously aware of particular behaviours. In the above quote, Nick also claims that the personalised individual feedback made him more aware of his behaviours ('it was improving my behaviour in terms of **being more aware of doing stuff**'). His engagement with the personalised individual feedback adds credibility to his argument that he had not been aware of particular behaviours and provides a socially acceptable explanation for not having behaved more environmentally sustainably before the study; because of his lack of awareness.

In chapter five, it was argued that Nick also uses a *discourse of compliance* to justify his new behaviours. It was argued that Nick deflected responsibility for his actions and uses discourses

[1] Bold illustrates respondent's emphasis. Here Nick stresses the words and raises his voice.

that remove responsibility from himself and focuses attention on an external and authoritative source. It is possible that in the above quote Nick also shifts accountability for his behaviour to external factors and social obligations, such as improving his behaviour in order to make an external difference; being influenced by iGreen; and being influenced by the personalised individual feedback. Using the *moral discourse* here also provides a socially acceptable explanation concerned with social obligations for his behaviour changes.

Some participants may have used the *moral* discourse to justify why the personalised individual feedback affected their behaviour because of the context of the research. Due to the environmental context of the research, participants may have said that they wanted to 'make a difference' because it seemed appropriate and in line with the research context. Unlike participants who use a *competition discourse* in the previous section, the examples in this section indicate that participants may want to persuade the interviewer that they improved their behaviour for selfless reasons. This creates the impression that they are responsible and willing to take action for the benefit of others.

In the previous chapter it was argued that participants used the *moral discourse* to also create an environmentally responsible presentation of self. However, they did so by using a negative stance, claiming that using iGreen made them feel 'bad' or 'guilty' and this encouraged them to adopt more pro-environmental behaviour. Engagement with the personalised individual feedback may have encouraged participants to employ a positive *moral discourse* because feedback provides a way in which to assess improvement and seems to evoke feelings of reward.

Participants who brought up the topic of the personalised individual feedback claimed that it affected their behaviour in a positive manner. They justified their changed behaviour in terms of either internal improvement (competition with their own answers) or external improvement (for altruistic reasons). This suggests that engagement with personalised individual feedback may encourage the use of more positive discourses than a quiz alone. For instance, participants who used a negative *moral discourse* (see chapter five) attributed their behaviour change to the quiz questions making them feel guilty. Use of both the positive and negative *moral discourse* suggests that a quiz and personalised individual feedback may provide an opportunity of self-evaluation and evoke particular feelings that consequently lead to behaviour change. This section looked at the discourses used in relation to the personalised individual feedback, the next section looks at the discourses participants use concerning the social norms feedback.

6.4 The social norms feedback and the in-group discourse

The *in-group discourse* is characterised by notions of conformity, group identity and the salience of peer norms. Only the participants Daniel and Krish in the social norms feedback group claimed in the interviews that the social norms feedback had an impact on their behaviour. These participants use an *in-group discourse* to justify the social norms feedback influencing their behaviour. Use of this version of the *in-group discourse* suggests that if social norms feedback is related to one's own friends, it is reasonable to be influenced by it. The first part of this section discusses the use of the *in-group discourse* to justify why the social norms feedback influenced some participants to change their behaviour.

However, as found in previous research (Nolan *et al*. 2007; and see chapter two), the majority of participants in the social norms feedback group claim that it did *not* have an impact on their behaviour. This was consistent with the questionnaire data, in which only 29% of participants agreed with the statement that they changed their behaviour because of the social norms feedback. In the interviews, these participants also use an *in-group discourse* but use it in an alternative way to argue that the social norms feedback had *no effect* on their changed behaviour. The second part of this section discusses this alternative use of the *in-group discourse*.

6.4.1 Social norms feedback influenced behaviour change

The following excerpt provides an example of the use of the *in-group discourse* from the interview with Daniel. The excerpt is Daniel's reply to the interviewer's probing for an explanation of his previous comment; that the social norms feedback made him switch off his phone charger more often.

Daniel:	I think, actually, if I hadn't had the arrows indicating that my friends [switched off their mobile phone charger], I probably wouldn't have, I probably wouldn't have done it.
Interviewer:	Why do you think that is?
Daniel:	I just think... I think if everyone else, I mean **my friends**, so if they're all doing it, you just tend to think maybe I should do that. You know.
Interviewer:	Yeah?
Daniel:	But that's me (laughs) me life in general! In various things! (laughs) You know, if everyone's doing something, which you think, which is a good thing, then um, you probably should do it yourself.

Although Daniel says that the social norms feedback made him change his behaviour (earlier in the interview), when asked by the interviewer to explain this he appears hesitant and uncertain. The above passage is heavily modalised from the onset with the phrases 'I **think**' and 'I **probably**

wouldn't have done it'. The continued use of modalised speech forms when explaining why he probably would not have changed his behaviour had he not received the social norms feedback indicates embarrassment. He seems uncomfortable with his claim that he was influenced by the social norms feedback and struggles to provide a confident explanation. Daniel's apparent discomfort with his explanation could be because some people do not like to admit conformity[1] (Sunstein, 1996). This will be discussed in the next chapter.

In an attempt to justify his claim (that he was influenced by social norms feedback), Daniel uses the *in-group discourse*: 'I think if everyone else, I mean **my friends**, so if they're all doing it, you just tend to think maybe I should do that'. He initially refers to 'everyone else', then quickly rephrases this as 'my friends' and emphasises these words by expressing them louder and in a more assertive tone of voice than the remainder of the passage. The implication here is that it is socially acceptable to conform with *your own* friends, but perhaps not 'everyone else'. This indicates that there is an underlying discourse of social acceptability in the text. This is further hinted at in the last line of the passage, in which the text implies that it is appropriate to behave like others if the behaviour is considered acceptable ('a **good** thing').

Daniel seems uncomfortable with expressing that he was influenced by the social norms feedback. This is indicated by the last line of the passage in which he appears to use the rhetorical device of hedging (Coupland, Coupland and Robinson, 1992, see chapter three). He speaks in a high pitched tone of voice and laughs frequently, which indicates embarrassment. It appears that Daniel is attempting to dispel his embarrassment by creating the impression that his claims are blithe, and therefore should not be taken seriously. There is also a change in his use of function words as the constant use of the personal pronoun 'I' is now replaced with the distancing pronoun 'you' ('**...**which **you** think, which is a good thing, then um, **you** probably should do it **yourself**.). The use of the distancing pronoun 'you' is at times used when an individual is negatively self-reflecting on an action or utterance (Pennebaker, 2011). This is consistent with the idea that Daniel is uncomfortable with saying that he had been influenced by the social norms feedback; he distances himself from the utterance and attempts to make it light-hearted.

[1] See chapter two and discussion in chapter seven

It is possible that Daniel is embarrassed to reveal that he had been influenced by the social norms feedback because it is difficult to provide a logical explanation for conforming (Milgram, 1974). However, due to the interviewer's demand to explain his claim that the social norms feedback made him change his behaviour, Daniel feels it necessary to provide an explanation and uses the *in-group discourse* to do so. Daniel's use of the *in-group discourse* suggests that it is acceptable to be influenced by friends and their normative perceptions that are considered socially acceptable. One interpretation of this is that people may find it difficult to admit to conforming with others but feel it acceptable to conform with a group that they are able to identify with. The next quote from the interview with Krish illustrates this point:

Interviewer:	Ok, so you said you saw what your friends answered and you thought I should be doing it too, why do you think that?
Krish:	Uhh, it's not necessarily that I should be doing it, but my thought was that if they can do it then I could also… it's um… you don't have an excuse 'cos I knew a lot of the friends were my colleagues and so they've got a very similar lifestyle to me, I know they work long hours and I know whatever else they do, so if they can do then it shows that I can do it as well, that I don't have to be better or do more than them, but I can match what they were doing and be as good as them.
Interviewer:	How did you feel if you were not as good as them?
Krish:	I, I, well… uhh, I just thought you know, I'll do a bit more next week and we might be on a level par, we might not but at least I've tried to be on a level par.
Interviewer:	Why did you want to be on level with them?
Krish:	Well, I think it's a fair reflection on the sort of age group, the sort of responsibilities these people have they're quite, they reflect quite well the person I am, so I can be on par with them.

Krish's initial hesitation and modalised speech indicates uncertainly and denial ('it's **not necessarily** that I should be doing it'). Krish struggles to answer the interviewer's question: 'but my thought was that if they can do it then I could also… it's um…' It is possible that Krish's apparent discomfort may be because he finds it difficult to articulate why he felt he should be behaving like his friends. Alternatively, and similar to Daniel in the earlier quote, Krish may be uncomfortable with the idea that he was influenced by the social norms feedback.

After the initial hesitation, Krish seems to be able to provide a more confident explanation – that being influenced by the feedback is justified because he could identify with the group that the feedback related to. For example, Krish asserts that he knew the feedback related to his work colleagues, who have a similar lifestyle to him and work long hours. Krish uses the assertive phrases 'I knew' and 'I know', which suggests that he is making a truth-claim. He provides a convincing argument that it is logical to have been influenced by the social norms feedback because the

feedback is based on evidence ('**I knew a lot of the friends were my colleagues** and so **they've got a very similar lifestyle** to me, **I know they work long hours**...'). His matter-of-fact rhetoric and confident intonation contour creates the impression that being influenced by the social norms feedback is acceptable because of his known proximity of the normative peer group and salience of that group.

Krish uses the *in-group discourse* again in the final line on the passage when the interviewer asks why he wants to be level with his colleagues. Here Krish explicitly refers to identifying with the group: 'I think **it's a fair reflection on the sort of age group**, the sort of **responsibilities these people have** they're quite, **they reflect quite well the person I am**'. This suggests that because he shares common characteristics with his peers who are using iGreen (e.g. their age and responsibilities), he is able to behave similarly. The implication here is that he can justify the social norms feedback influencing his behaviour because to share similar characteristics with a group indicates that he too can behave as environmentally sustainable.

Another notable point in the quote is Krish's assertion that he does not have a desire to surpass his colleague's answers ('I **don't have to be better or do more than them**'; 'I'll do a bit more next week and we might be on a level par, **we might not but at least I've tried to be on a level par**'). Krish seems to be saying that he did not compete with the social norms feedback, which is consistent with the arguments put forward earlier in this chapter (section 6.2). Rather than competing with the feedback, he seems to be saying that he wanted his answers to be similar to the social norms feedback. This is in line with Schultz *et al.'s* work (2007, see chapter two). Schultz *et al.'s* research on energy consumption showed that when individuals were presented with social norms feedback about their neighbours' energy consumption, participants preferred to consume a similar amount of energy rather than less or more. The current study similarly suggests that social norms feedback that participants associated with an identifiable in-group discourages people to compete because people have a desire to be similar to the in-group.

People who receive social norms feedback may feel it necessary to use pro-social discourses rather than those concerned with self-interests (such as the *competition discourse*) because they may be more appropriate when discussing social norms feedback. An explanation for the absence of a *competition discourse* when discussing the social norms feedback is that it explicitly communicates a pro-social discourse. The personalised individual feedback has no external comparison, and therefore, may have encouraged participants to use a self-interested and *competitive discourse*.

Social norms feedback may have nudged participants to use a pro-social discourse because it provides a comparison to others' environmental behaviour and makes salient environmental injunctive social norms.

The above examples illustrate the use of the *in-group discourse* to justify why the social norms feedback influenced some participants to change their behaviour. It is now important to consider the potential explanations for the use of the discourse in order to better understand the meaning that underpins participants' talk. The above examples suggest that the use of the *in-group discourse* justifies conformity to a proximal reference group (see chapter two). A reference group refers to people who an individual shares similar attitudes and values and regards as their peers, friends and family (Neighbors *et al.* 2008; 2010). Neighbors *et al.*'s research indicates that a proximal reference group to which individuals are closely connected by proximity or identification (i.e. friends and family) have greater influence on an individual's behaviour than distant groups. Therefore, normative perceptions of proximal reference groups are more likely to influence an individual's behaviour than normative perceptions of distal groups (Borsari and Carey, 2003; Neighbors *et al*. 2008; 2010).

Amongst the participants in the current study, it appears that it is considered more socially acceptable to admit being influenced by in-group members than by others in general, perhaps because it does not seem rational to conform with people who we do not identify with. This is further suggested in the interviews with other social norms feedback group participants, who argue that the social norms feedback was *ineffective* because the feedback was not knowingly based on a relevant reference group.

6.4.2 The lack of influence of the social norms feedback

The previous section presented evidence for the use of the *in-group discourse* to justify why the social norms feedback influenced some participants to change their behaviour. An alternative use of the *in-group discourse* is used by many other participants who claim that the social norms feedback did *not* influence them to change their behaviour. Use of this alternative *in-group discourse* suggests that the feedback lacks credibility because it is not based on scientific evidence.

In the previous section, it was argued that Daniel and Krish justified their behaviour change because of the social norms feedback influencing them. The interview talk suggested that they were affected by the social norms feedback because they perceived it to be associated with a relevant reference

group that they identified with. However, all other social norms feedback group participants argue that the social norms feedback did not have an impact on their behaviour and the interviews highlighted some explanations. For example, some participants said that they did not believe the feedback as an accurate representation of what other people do. They stated that they would not believe what other social media users say in general because people tend to want to present themselves in a positive way, and therefore may be dishonest. Many participants claimed that the feedback did not have an impact because it did not inform them who the feedback related to or the number of friends the feedback was based on. As Ed explains:

Interviewer:	And you said you noticed the information about your friends as well?
Ed:	Yeah, but it didn't affect me really, 'cos I didn't know how many friends that actually related to, was that just one person or was that five people or was that ten people? I was doing it as an individual, and, you know, if I'm not as green as **"my friends"**[1] then, so be it!
Interviewer:	Oh, what do mean by "my friends" {imitates Ed's body language}
Ed:	Well, was it really **my friends** or just a bunch of people I don't know? Who knows? Also, on Facebook there's so many people who you don't even talk to, you know. Like friends from primary school are on mine who I haven't spoken to in years, so if [the feedback] is about them, then it's not really "my friends", is it?

The interviewer's vague questioning of Ed's earlier mentioning that he noticed the social norms feedback initiates a discussion on how the feedback did not affect Ed's subsequent behaviour. It is notable that the language concerning the social norms feedback is assertive and defiant ('**it didn't affect me** really, 'cos **I didn't know how many friends that actually related to**'). The talk is then concerned with questioning the nature of the feedback ('was that **just one person** or **was that five people** or **was that ten people**?). This declamatory language is consistent with Ed's body language, where it was noted in the interview that he made the physical gesture of *air quotes* in regards to the social norms feedback being based on his own friends. He explicitly questions the credibility of the feedback (the number of people and who the feedback was based on) and seems to be arguing that due to the lack of evidence, he was not influenced by it.

When the interviewer asks Ed to explain his physical gesture of *air quotes,* Ed continues to question the credibility of the social norms feedback. He openly challenges the interviewer on who the feedback related to: 'was it really **my friends** or just a bunch of people I don't know? Who knows?' The rhetorical question at the end of this sentence ('who knows') and the shrugging of his shoulders

[1] Ed's body language expresses sarcasm indicated by his use of *air quotes*

(noted in the interview transcript) suggests ridicule of the feedback as it implies that the interviewer herself does not know.

It is noticeably bold to criticise the feedback in the presence of the interviewer. The passage also ends with a frank remark and explicit criticism of the credibility of the feedback ('it's not really "my friends", is it?'). The implication here is that Ed is not concerned with pleasing the interviewer. On the other hand, his discourse may be concerned with attempting to impress the interviewer of his knowledge about Facebook. For instance, his assertive and matter-of-fact rhetoric when describing the social media site conveys his knowledge of Facebook ('also, on Facebook there's so many people who you don't even talk to, you know'). The tag-question 'you know' at the end is articulated as a statement, suggesting that the interviewer should also be aware that *Facebook friends* can be acquaintances rather than actual friends ('like friends from primary school are on mine who I haven't spoken to in years').

Ed's candid attitude is consistent with the remainder of his interview when the interviewer asks him about the smiley face emoticons included in the social norms feedback (see chapter two and three):

Interviewer:	Ok, so did you notice the smiley faces?
Ed:	I guess they gave you a feeling of, ok, you're being "green" in inverted commas, um… but not particularly, I just treated it as a test really, a test where you have to give your most truthful answer, so the [smiley] faces or the friends' thing didn't affect my answers.

In this quote, Ed continues to use ridicule and sarcasm in his speech. The rhetorical aim of this particular presentation of self may be to convey to the interviewer that he is a logical and methodical person. He refers to iGreen as a 'test' and describes providing his 'most truthful answer', which is in line with the scientific nature of his discourse.

Ed refers to the smiley face emoticons and the social norms feedback as frivolous and insignificant to his behaviour change ('so the **faces** or the **friends' thing** didn't affect my answers'), perhaps because they do not correspond with his *in-group discourse*. This may also explain the absence of the *games discourse*, the *competition discourse* and the *moral discourse* in his interview; these discourses are not related to science or fact but competitiveness, play and morality. The use of the *in-group discourse* presents Ed as not malleable, and as an individual whose behaviour is governed by evidence, rather than features of iGreen that might be perceived as trivial.

Evidence has been presented of the use of a variation of the *in-group discourse*, which participants use to justify why the social norms feedback had not been influential in changing their behaviour. It is important to consider other possible explanations for the lack of impact of the social norms feedback. For example, the technical issues met when implementing the social norms feedback in iGreen may have limited the impact of the feedback. In this study, because the social norms feedback could not be based on actual friends, features such as how many people and which people the feedback related to could not be included. This may explain why participants claimed that other aspects of iGreen was more influential in changing their behaviour; because the social norms feedback caused distrust and doubt. Thus, some participants may have felt it more appropriate to use other discourses to justify their behaviour. On the other hand, as suggested in previous literature, participants may not have realised the impact of the social norms feedback or wanted to admit conforming (Sunstein, 1996; Nolan *et al.* 2007).

Participants who claim that they were influenced by the social norms feedback may have felt it appropriate to say that it influenced them because they were able to identify with a specific group that used iGreen. For instance, Krish assumed that the feedback was based on his work colleagues as he saw them using the app, and therefore, he was able to relate the social norms feedback with a relevant reference group. This may have provided a more credible source, and therefore it was perhaps more acceptable to say that it influenced his behaviour. The theoretical and practical implications of these findings will be discussed in the following chapter.

6.5 Chapter summary

This chapter presented evidence of the different discourses used by the intervention groups. The *games discourse* was employed only by participants in the no feedback group. They used this discourse to justify the adoption of more pro-environmental behaviour. It was argued that the no feedback group participants may have used a *games discourse* because it was an available aspect of the app they could draw on. It was clear that no feedback group participants were uncomfortable with saying that they were influenced by the games, perhaps because games are conventionally considered as entertaining rather than serious. This may explain why participants who received feedback did not make use of the *games discourse*, because other aspects of iGreen were made salient to them that they could draw on that may have been considered more scientific. For instance, both personalised individual feedback and social norms feedback group participants claimed that the personalised individual feedback was influential in changing their behaviour and used different discourses to justify this.

Participants in both feedback groups used a *competition discourse* or a *moral discourse* in their talk about the personalised individual feedback. Depending on their selected forms of presentation of self, participants used the two discourses in various ways. Some participants used the *competition discourse* to present a particular type of presentation of self; one that is competitive and independent. This might be because some people like to incur disapproval that follows norm-violation as it presents them as non-conformists (Sunstein, 1996). In contrast, some participants used a *moral discourse* to justify why the personalised individual feedback had an impact on their behaviour. The difference here appears to be concerned with presenting a more socially desirable presentation of self.

The *moral discourse* was introduced in chapter six in which it was argued that participants used a negatively connoted version of the *moral discourse* to justify why they changed their behaviour. However, when participants discussed the impact of the personalised individual feedback, they used a *moral discourse* which indicated that they changed their behaviour because seeing the feedback produced positive feelings (i.e. feeling 'rewarded'). The implication here is that using iGreen encouraged participants to use a *moral discourse* but the personalised individual feedback appears to have influenced some participants to use the discourse in a positive way. It appears that different aspects of iGreen made available a range of discourses that participants could draw on to explain their behaviour change.

The final section of this chapter introduced the *in-group discourse*, which was used in participants' talk concerning the social norms feedback. Some participants used the discourse to justify why the social norms feedback influenced them to change their behaviour. Other participants used an alternative and more scientific variation of the *in-group discourse* in order to argue that they were not influenced by the social norms feedback. In both cases, the *in-group discourse* is characterised by notions of conformity and group identity. The discourse indicates that it is reasonable to conform to social norms feedback if an individual identifies with the specific group that the norms are related to. However, the lack of differences between the three groups behaviour change, and the fact that all participants except for two claimed that the social norms feedback had no impact on their behaviour, raises important questions about the additional impact of social norms feedback when a quiz, games or personalised individual feedback can be used.

Chapter seven brings together the empirical evidence from the three findings chapters (four, five and six) into a theoretical framework and discusses the implications of the findings presented in the three chapters.

7.0 Discussion and Conclusion

The aim of this study was to explore if the social norms approach could be used in a social media app to encourage pro-environmental behaviour, and to investigate how and why. To meet this aim, a bespoke Facebook app called iGreen was developed and used as part of a seven-week social norms intervention, with the inclusion of personalised individual feedback, to examine its efficacy to encourage pro-environmental behaviour change. Following the intervention, qualitative in-depth interviews were conducted with some participants who used iGreen. Drawing on elements of a discourse analysis approach to analyse the interviews enabled an understanding of why a social norms intervention did, or did not encourage pro-environmental behaviour and how people responded to personalised individual feedback and social norms feedback.

This chapter begins with an overview of the key findings with respect to the research questions identified in chapter one. The second section addresses the theoretical implications of the findings of this research. The third section identifies the methodological contributions of this research and indicates how the methods used have potential practical application in future social norms research to encourage pro-environmental behaviour. The fourth section critically reflects on the research, and this is followed by some recommendations for future research. The chapter ends with the researcher's concluding reflections.

7.1 Research questions and key findings

This section outlines the research questions (RQs) this study set out to address, along with the key findings that relate to these questions.

RQ1. Did the social norms approach lead to any behaviour change?

This research explored the efficacy of the social norms approach to encourage pro-environmental behaviour change. The research suggests that following the iGreen social norms intervention, participants changed some of their behaviours. For example, without being prompted by the interviewer, participants reported that they turned off taps when cleaning their teeth more often, switched off home computers when not in use, boiled the kettle with only as much water as necessary, switched off their mobile phone chargers and turned off televisions rather than leaving them on standby. Although the extent of these behaviour changes varied between participants, in every interview participants claimed they had changed one or more of these behaviours.

The research also indicates that participants *did not* change all environmental behaviours following the intervention. For example, many participants claimed that they did not change their showering/bathing behaviour, the items of clothing they were willing to wear more than once, and their eating habits.

Although the research suggests that participants did change *some* of their behaviours following the social norms intervention, this did not seem to be because of the social norms feedback. Participants in all three intervention groups claimed to have changed some behaviour and there were no apparent differences between the groups. This is discussed in the next section.

RQ2. How do people respond to individual feedback and social norms feedback and are there any differences between the three groups?

This research included qualitative in-depth interviews that explored how participants responded to the personalised individual and social norms feedback provided in the iGreen intervention. This study indicates that participants noticed the feedback and engaged with it. Although the interview talk varied between participants, unprompted discussion about the feedback was present in some way in all interviews with participants in the feedback groups. This suggests that social media platforms, such as Facebook, can be used to successfully deliver normative feedback (discussed further in section 7.3).

This study suggests that people are more prepared to attribute their behaviour to personalised individual feedback than social norms feedback. In the interviews, participants tended to respond negatively to the social norms feedback. Even the few participants who said that the social norms feedback had influenced their behaviour change did so reluctantly; they seemed uncomfortable and embarrassed to reveal this. All other participants challenged the social norms feedback and said that it did not affect their behaviour. Analysis of the interviews highlighted two explanations for participants' negative response to the social norms feedback. Firstly, some participants questioned the credibility of the social norms feedback. Secondly, because participants did not know who the feedback was based on, they did not feel it was relevant to them. The few participants who claimed that the feedback had affected their behaviour explained that this was because they knew that it related to their own friends. Although participants generally responded negatively to the social norms feedback, their interview talk nevertheless suggests that they did engage with the feedback as indicated in their questioning its legitimacy.

The social norms literature indicates that if people question the credibility of social norm messages, the impact of social norms will be less effective (Perkins, 2003; McAlaney, Hughes and Bewick, 2011). This study supports the literature as the qualitative interviews suggest that participants questioned the credibility of the feedback as an accurate representation of how most people behave and this may explain why participants said that it did not influence their behaviour. Recommendations on how to improve social norms feedback on social media platforms are made later in this chapter.

The proximity of the reference group is central to social norms theory and this is consistent with the findings in current study. For example, some participants claimed that they ignored the social norms feedback because they did not know who the feedback related to. This study suggests that participants are not likely to be influenced by other social media users generally. Participants suggested alternative normative reference groups that they considered would be more personally relevant, such as their close friends and people who they socialise with regularly. Thus, this study suggests that relevant reference groups on social media platforms, such as close friends rather than *Facebook friends* in general, may improve the impact of social norms feedback (see section 7.4).

This study also explored any differences in the changes that occur when people are provided with feedback compared to those who received no feedback, as well as explored the impact of personalised individual and social norms feedback. Analysis of the data suggests that there were no noticeable differences between the quiz answers given by participants in the three intervention groups, which suggests that the feedback may not have had an additional impact on participants' behaviour. Although in the interviews participants who received feedback said that the personalised individual feedback was more effective than the social norms feedback, there were no differences between the feedback groups and the control groups quiz answers. A possible explanation for the lack of differences between the groups' behaviour change is that other aspects of the iGreen app were more salient to participants. For example, all participants said that the quiz questions influenced their behaviour. This suggests that quiz questions on an individual's behaviour may be as influential as providing feedback and this is clearly worth further investigation (discussed in section 7.2.3).

RQ3. What discourses do participants use when discussing the impact of the intervention and what can be interpreted from these discourses?

As discussed in the previous section, one of the main findings from this research is that the social norms feedback did not seem to encourage participants to change their behaviour. The qualitative in-depth interviews investigated participants' explanations for the impact *and* lack of impact of the social norms intervention on their behaviour. Analysis of the interview transcripts identified a range of discourses (summarised in table 7.1). Explanations for participants' behaviour change and justifications for not changing some behaviour were inferred from these discourses.

Following the table is a summary of the researcher's interpretations of these discourses. Interpretations of the discourses provide an insight into how and why different aspects of a social norms intervention can encourage pro-environmental behaviour.

Table 7.1 Discourses used to explain the impact of the intervention

Discourses	Use of discourse and interpretation of use	Chapter discussed
Too green discourse	Used by many participants to justify not changing some behaviour. Some environmental behaviour represented as 'too green' and not normal to adopt.	Chapter four
Discourse of Ignorance	Used to justify previous behaviours that were not environmentally sustainable. Use of this discourse suggests that some people are not aware of their everyday behaviours that are not environmentally sustainable, and that increasing awareness may lead to behaviour change.	Chapter five
Discourse of Compliance	Used to explain behaviour change and pro-environmental behaviour represented as a social obligation. Use of this discourse suggests questionnaires can increase the salience of implicit injunctive norms related to environmental behaviour and can encourage behaviour change.	Chapter five
Moral Discourse	Used by some participants to justify behaviour change. Pro-environmental behaviour change represented as a moral obligation. Use of this discourse suggests that quiz questions made participants feel guilty. Some participants used the moral discourse to justify why the individual feedback influenced their behaviour change. The moral discourse used by these latter participants is characterised by positive emotions (reward) rather than negative emotions (guilt).	Chapter five and six
Games Discourse	Only evident in interviews with control group participants and used to justify behaviour change. Use of this discourse may be because the games were the only salient aspect of iGreen to draw on. Hesitant use of the discourse indicates people seem uncomfortable with saying that gamification influenced their behaviour.	Chapter six
Competition Discourse	Used by both individual and social norms feedback group participants to justify behaviour change. Use of discourse suggests individual feedback may encourage people to change their behaviour because it provides a means of self-evaluation and a sense of improvement.	Chapter six
In-group Discourse	The discourse is characterised by notions of conformity and group identity. Only used by participants who received social norms feedback. Participants used the in-group discourse to explain why social norms feedback influenced behaviour change or to justify why social norms feedback did not have an impact. Use of discourse indicates that it is considered reasonable to conform to social norms feedback if an individual identifies with the specific group that the norms are related to.	Chapter six

Too green discourse

The *too green discourse* represents the view that being an environmental activist is not normal or socially acceptable. In the *too green discourse*, particular pro-environmental behaviours (e.g. forgoing a daily shower) are represented as not normal and described as 'too green'. Participants who used the *too green discourse* associated these behaviours with 'green people' and characterised

'green people' in a negative manner, such as unhygienic and 'weird'. Use of this discourse suggests that pro-environmental behaviour change can be constrained by perceptions of what 'green people' do and what 'normal people' do. Some participants justified not changing some behaviours because they did not identify with those they described as 'green people'. This may be because people's identities can be influenced by the behaviour of their social group, which may not be perceived as green or environmental (Kinzig *et al.* 2013). A similar finding was recognised in Hobson's (2001, p.197) research, in which participants in her Action at Home study 'expressed a desire to *not* be seen being too "green" (emphasis in original). This is also in line with previous research which found that *being green* was seen as undesirable and 'green people' were referred to as 'weird' (Lorenzoni, Nicholson-Cole and Whitmarsh, 2007, p.451). In the current study, the distinction participants made between 'green' and 'normal' people may explain the differentiation between environmental behaviours people were willing to change (e.g. turning off taps and electrical appliances when not in use) and behaviours they were not (such as showering less frequently, re-wearing clothes more often and eating less meat). This study suggests that pro-environmental behaviour change can be constrained due to people associating some behaviours with the stigmatisation of environmental activists.

Discourse of ignorance

The *discourse of ignorance* represents participants' claims to a lack of awareness of their previous behaviours before using iGreen, rather than being ignorant of what pro-environmental behaviour is. Use of this discourse suggests that some people are aware of the importance of environmentally sustainable consumption, but not aware of their own behaviours that are not environmentally sustainable. This is consistent with the wider environmental literature, which states a disparity between possessing environmental awareness and carrying out environmental behaviours (Lorenzoni, Nicholson-Cole and Whitmarsh, 2007). Use of the *discourse of ignorance* suggests that making people aware of their everyday behaviours can lead to pro-environmental behaviour change. Participants who used this discourse attributed their changed behaviour to the iGreen quiz questions making them more aware of their behaviours. Therefore, the study suggests that quiz questions can prompt people to reflect on their behaviour and subsequently change them. This is discussed further in section 7.2.3.

Discourse of compliance

In this discourse, some pro-environmental behaviour is represented as a social obligation governed by established injunctive social norms. Use of the *discourse of compliance* indicates that the iGreen

quiz questions increased the salience of injunctive social norms about pro-environmental behaviour and that this encouraged behaviour change. Therefore, this study suggests that increasing the salience of injunctive social norms can lead to pro-environmental behaviour change. This has been recognised in previous research (Cialdini Reno and Kallgren, 1990), and will be discussed in section 7.2.2.

Moral discourse

In contrast to the *discourse of compliance*, the *moral discourse* represents pro-environmental behaviours as a moral obligation[1]. Unlike the *discourse of compliance*, in this discourse there is an expressed concern for the environment as a moral obligation with a lesser tendency towards feeling that pro-environmental behaviour change is a social obligation. Feelings of moral obligation have been referred to as personal norms and people conform to personal norms to avoid feelings of guilt (Schwartz, 1964). The current study suggests that increasing the salience of personal norms can lead to pro-environmental behaviour change. For example, participants who used the *moral discourse* claimed that completing the iGreen quiz produced negative feelings of guilt about their behaviour, and some claimed that the personalised individual feedback produced positive feelings of reward for being altruistic, which encouraged them to change their behaviour. Use of this discourse suggests that a social media quiz has the potential to increase the salience of personal norms about pro-environmental behaviour and this may encourage behaviour change.

Competition discourse

Within the *competition discourse*, notions of competition and winning are not used in the conventional sense (e.g. competing against other people). Earlier research indicates that social norms can cause competitiveness (Foster *et al.* 2009). However, it was noted in this study that participants' references to competition concerned surpassing their own score (the personalised individual feedback) when completing the iGreen quiz. Use of the *competition discourse* suggests that personalised individual feedback can lead to self-evaluation and improvement. Personalised individual feedback may encourage people to change their behaviour because it provides a means of self-evaluation and a sense of improvement. A similar finding has been recognised in previous research. For example, in the CHARM energy study, some participants decreased their energy

[1] Moral obligations are internalised values and norms governed by feelings of self-expectations and not social expectations (Schwartz, 1964, p.223 and see chapter two for discussion).

consumption partly because of the sense of improvement they gained from the individual feedback (Harries *et al.* 2013b).

In-group discourse

Use of the *in-group discourse* suggests that it is acceptable to conform to social norms feedback if the feedback is knowingly based on a relevant reference group. The few participants who said that the social norms feedback influenced their behaviour change explained that they thought the feedback was related to their own friends. However, all other participants who used the *in-group discourse* claimed that the social norms feedback did not influence their behaviour change because they did not know which people on Facebook the feedback related to. This suggests that social norms feedback provided in a social media app is more likely to influence behaviour if the feedback is knowingly based on a relevant reference group. Similar findings have been suggested in previous research (Neighbors *et al.* 2008; 2010). On the other hand, some research has shown the powerful impact of social norms to influence behaviour even when the norm is not knowingly related to a relevant reference group (Cialdini Reno and Kallgren, 1990). A discussion on why the social norms feedback did not seem to encourage participants to change their behaviour in this study will be provided later in this chapter.

7.2 Theoretical contributions of research

Findings from this study are discussed in the context of previous research on: the impact of personalised individual and social norms feedback on behaviour change, increasing the salience of norms to encourage pro-environmental behaviour and increasing people's awareness of everyday behaviours.

7.2.1 The impact of feedback

This study questions the ability of social norms feedback to encourage pro-environmental behaviour because participants in all three intervention groups claimed to have changed some behaviour and there were no apparent differences between the control and feedback groups. Furthermore, there was no statistical evidence for differences between the three groups quiz answers for any of the iGreen quiz questions.

Participants attributed their behaviour change to the quiz and the personalised individual feedback, more than the social norms feedback. This differs from earlier research which suggests that *social norms* influence pro-environmental behaviour (Schultz *et al.* 2007; Nolan *et al.* 2008; Goldstein,

Cialdini and Griskevicius, 2008). There is no simple method to determine why the social norms feedback did not influence participants' behaviour in the current study because it is difficult for people to recognise what influences their behaviour and to explain this. The interviews provided explanations for the apparent lack of impact of the social norms feedback and these are discussed below.

It is possible that other aspects of iGreen seemed more influential than the social norms feedback because participants did not realise its impact. Some participants may have denied conforming to the social norms feedback because they were unaware of the influence it had. There is evidence (see chapter two) indicating that people are generally unaware of the influence of social norms on their own behaviour (Nolan *et al.* 2008; Goldstein, Cialdini and Griskevicius, 2008). For instance, in Nolan *et al.'s* (2008) study, although normative information on energy consumption produced significantly more energy conservation, participants rated the normative information as least likely to change their energy consumption behaviours. This may be because people tend not to recognise why they behave as they do (Goldstein, Cialdini and Griskevicius, 2008).

Another explanation is that participants claimed that the social norms feedback did not influence their behaviour in order to deny conformity (Milgram, 1974; Cialdini, 2003). Sunstein (1996) argues that some people like to defy norms because it presents them as independent and non-conformist, which may be considered more socially desirable in some groups than conforming. For example, participants who used the *competition discourse* and some that used the *moral discourse* argued that they were not influenced by other people. Some people may understate the impact of social norms on their behaviour because they may not want to admit being influenced by others. It was not possible to examine this in the current study but participants' use of the *competition* and *moral discourse* suggests that some people defy conforming to social norms. Furthermore, previous research (Nolan *et al.* 2008) has shown that although people did not believe that the behaviour of others influenced their own, their energy conservation behaviours were powerfully influenced by it.

Another explanation for the social norms feedback not influencing participants' behaviour may be that the impact of the personalised individual feedback confounded that of the social norms feedback. It is important to note that those in the social norms feedback group received both personalised individual and social norms feedback simultaneously, and may have confused the impact of the latter with that of the former. Very few studies have isolated the impact of

personalised individual feedback and social norms feedback on pro-environmental behaviour change. Although Bewick *et al.'s* (2008, see chapter two of this thesis) research included personalised individual feedback and social norms feedback on participant's alcohol consumption, participants in the intervention group received the two forms of feedback simultaneously. There was no report of differences between the impact of personalised individual and social norms feedback. Similarly, in Schultz *et al.'s* (2007) study on energy consumption, participants in the intervention group were provided with personalised individual and social norms feedback together. Therefore, a comparison of personalised individual feedback and the social norms feedback was not made. Although in the current study the personalised individual feedback was provided separately, the social norms feedback was not examined independently and this would have been a better comparison of the impact of the two different types of feedback. Further research is required to understand if feedback on one's own behaviour could be as influential in encouraging pro-environmental behaviour as social norms feedback by isolating the impact of personalised individual feedback from those of social norms feedback.

In this study, the reference group that the feedback was based on may have reduced the impact of the social norms feedback. The interviews suggest that users of social media platforms, such as Facebook, are not the most relevant reference group. An individual's *Facebook friends* can include a broad range of people; varying from close friends to people they have never met. As it was not clear which of their *Facebook friends* the social norms feedback in iGreen related to, some participants discounted the feedback. Previous social norms research also indicates that a reference group which individuals are closely connected by social and geographical proximity will have greater influence on an individual's behaviour than distant groups (Neighbors *et al.* 2010).

7.2.2 Increasing the salience of norms

As discussed in the previous section, this research suggests that the social norms feedback did not have an impact on many participants' behaviour. Nevertheless, the interviews suggest that the iGreen intervention encouraged some pro-environmental behaviour change. There was some evidence that the iGreen quiz increased the salience of injunctive social norms about pro-environmental behaviour and this seems to have led to some behaviour change.

Some participants used a *discourse of compliance* (see table 7.1) to legitimate their behaviour change. These participants described the behaviours covered in the iGreen quiz as clearly '*what you should do*', and this was their justification for changing some behaviours. Use of the *discourse*

of compliance suggests that the quiz questions increased the salience of established injunctive social norms (what one 'should do') and communicated societal approval of particular behaviours. Findings from this study support Cialdini, Reno and Kallgren's (1990) focus theory of normative conduct. This theory states that social norms are more likely to encourage socially desirable behaviour when the norm is injunctive *and* made salient in a given situation. Cialdini (2003) states that because injunctive norms are based on an existing understanding of socially approved conventions in society (e.g. to protect the environment), they are likely to influence behaviour.

In addition to supporting the focus theory of normative conduct, the findings support norm activation theory[1]. Norm activation theory states that activating personal norms can lead to pro-environmental behaviour (Vandenbergh, 2005; Thøgersen, 2006; Harland, Staats and Wilke, 2007). Personal norms refer to feelings of moral obligation to behave in a particular way and guilt has been emphasised as the primary motive for conforming to moral obligations. Schwartz (1964) refers to feelings of moral obligation as personal norms, and Koger and Du Nann Winter (2010) state that people act on personal norms to avoid guilt. Whilst the focus theory of normative conduct concerns the effects of injunctive social norms to lead to behaviour change, the current study suggests that increasing the salience of *personal norms* may also lead to behaviour change. Compared to participants who used the *discourse of compliance,* those who used the *moral discourse* represented their changed behaviours as a moral obligation. Participants who used the *moral discourse* argued that answering the quiz questions produced negative feelings of guilt and this seems to have led to some behaviour change.

Participants who used the *moral discourse* to justify their behaviour change claimed that they were not influenced by what other people do. Whilst there is insufficient information in this study to comment on the accuracy of participants' claims, the findings are similar to those of norm activation research. Previous norm activation research suggests that people act on personal norms to avoid guilt, whether or not other people disapprove (Black, Stern and Elworth, 1985; Guagnano, Stern and Dietz 1995; Thøgersen, 2006). Some authors (Pelletier *et al.* 1998; Ryan and Deci, 2000; Koger and Du Nann Winter, 2010) consider personal norms more powerful than social norms because when people engage in environmentally sustainable behaviour for intrinsic reasons (i.e. a concern

[1] See chapter three of this thesis

for protecting the environment), their actions will be more consistent than people who act environmentally sustainably for extrinsic reasons (i.e. for social approval or due to group pressure). This research suggests that some people may be influenced by social norms to behave in more pro-environmental ways, whereas others may be more influenced by personal norms. It is difficult to discern why some people respond to social norms whilst others to personal norms. Tentative interpretation of the discourses identified in this study provides a possible explanation. Participants' use of the *moral discourse* suggests that they may hold personal norms concerning pro-environmental behaviour, and activating these personal norms encouraged their behaviour change perhaps because they felt a personal responsibility for the consequences of their behaviour. Not behaving in an environmentally sustainable manner may have made them feel guilty as they were violating their personal norms, and adopting more pro-environmental behaviour produced positive feelings of reward for being altruistic. On the other hand, participants' use of the *discourse of compliance* suggests that some people may have adopted more pro-environmental behaviour because of the anticipation of social approval, or disapproval for not behaving in an environmentally sustainable manner. This is consistent with Kinzig *et al.'s* (2013) explanation for why people do not litter; they suggest that some people do not want to feel that they are the type of person who litters (personal norms), whilst some do not want others to think they are the type of person who litters (social norms).

The present findings highlight the importance of the focus theory of normative conduct and norm activation theory for understanding different normative influences on behaviour. For example, both theories can be drawn upon to understand the differences in participants' claims for changing behaviour. In line with norm activation theory, it seems that the quiz questions activated personal norms about protecting the environment and that this led to behaviour change. In line with the focus theory of normative conduct, it seems that implicit injunctive social norms were made salient by the quiz questions and that this led to behaviour change. Although the question of whether personal norms or social norms have more of an impact on behaviour cannot be answered by this study (and is not the intention of this study), the findings indicate that research on both theories is required. Norm activation theory provides an explanation on how personal influences, such as one's moral concern for the environment, can encourage pro-environmental behaviour. The focus theory of normative conduct provides an explanation on how social influences, such as social obligations governed by established norms, can encourage pro-environmental behaviour. Both theories illuminate why increasing the salience of different types of norms can encourage pro-environmental behaviour change.

Research on norms (Vandenbergh, 2005; Cialdini *et al.* 2006) has generally focused on the influence of personal norms *or* social norms when exploring normative influence on environmental behaviour. The current study suggests that increasing the salience of social *and* personal norms may be more influential in encouraging pro-environmental behaviour as different people respond to different types of norms, and this would be worth further investigation in future research. Overall, and in line with previous findings (Cialdini *et al.* 2006; Harland, Staats and Wilke, 2007), this study suggests that increasing the salience of norms can encourage pro-environmental behaviour change.

7.2.3 Increasing awareness of everyday behaviours

This study suggests that increasing people's awareness of their own everyday behaviours can encourage pro-environmental behaviour. Although it is recognised that increasing norm salience can encourage behaviour change (Cialdini *et al.* 2006), there is limited qualitative research that has explored why increasing the salience of social norms can encourage pro-environmental behaviour (for example, see Hing Lo *et al.* 2013). This study provides an insight into why increasing the salience of norms associated with everyday domestic behaviours that impact on the environment can encourage behaviour change.

This study suggests that before the iGreen social norms intervention, some participants had not been aware that some of their everyday behaviours were not environmentally sustainable, and that answering the iGreen quiz questions made them more aware of these behaviours. This can be interpreted in line with Giddens' concept of practical consciousness in his structuration theory[1]. Giddens (1984, p.xxiii) defines the practical consciousness as '…all the things which actors know tacitly about how to 'go on' in the contexts of social life without being able to give them direct discursive expression'. Practical consciousness enables people to behave without having to reflexively think about how to behave. For example, when people clean their teeth everyday they tend not to think about how they do it. In this study, some participants claimed that they did not realise that they were leaving on taps whilst cleaning their teeth or washing dishes because they did not think about their behaviour. Some everyday behaviours were simply taken-for-granted and participants did not realise that they were behaving unsustainably because they did not reflect on

[1] See chapter one of this thesis for details

their behaviour. Drawing on Giddens' structuration theory, these behaviours were part of participants' *practical consciousness.*

Some participants claimed that completing the iGreen quiz increased their awareness of some everyday behaviours. This can be interpreted in line with Giddens' (1984) concept of *discursive consciousness*. Whereas practical consciousness is a form of knowledge that people use to go about their everyday behaviours without having to think about them, discursive consciousness is an awareness of knowledge that people can articulate and is the reflexive monitoring of action. Giddens argues that the distinction between practical and discursive consciousness is not fixed, and the division between the two types of consciousness can be altered by an individual's learning experiences. In this study, the quiz questions seem to have made participants think about how they performed everyday behaviours that they had not previously reflected on. Completing the quiz was a learning experience in which they realised that some of their everyday behaviours were not environmentally sustainable and subsequently they changed these behaviours.

The findings in this study support those from Hobson's (2003) Action at Home research[1]. Hobson's research suggests that making people aware of their everyday behaviours can lead to more environmentally sustainable behaviours. Hobson, too, draws on Giddens' (1984) structuration theory in order to interpret her results. Hobson's research suggests that the Action at Home programme encouraged participants to consider behaviours that were usually unnoticed in the *practical consciousness* and participation in the programme brought these behaviours into the *discursive consciousness*.

The present findings are similar to those in Hobson's research as participants claimed that before completing the iGreen quiz they did not consider their everyday environmental behaviours. Answering the iGreen quiz questions seemed to make participants think about their behaviours, and subsequently change them. In line with Hobson's work, the present study indicates that structuration theory can provide an understanding of why some people are aware of the importance of environmental conservation but continue to behave unsustainably. Everyday behaviours are not readily accessible in people's discursive consciousness. This study suggests that the iGreen quiz questions evoked questions about participants' everyday behaviours and prompted them to think

[1] See chapter one of this thesis

how they should change them in relation to their existing understanding of environmental conservation. Using Giddens' structuration theory to better understand the impact of know-how, self-awareness and norms on behaviour change has been under-researched. Structuration theory can illuminate the connection between increasing awareness of implicit norms related to everyday behaviours and encouraging pro-environmental behaviour change.

Future environmental campaigns could benefit from increasing the salience of norms and everyday behaviours in order to encourage behaviour change. The rationale of some campaigns is that more environmental information is required to encourage pro-environmental behaviour change. However, information-based approaches have limited impact on environmental behaviours (Kollmuss and Agyeman, 2002; Hinton, 2010), because environmental information does not make people aware of their *own* behaviours or increase the salience of environmental norms related to their behaviour.

It is difficult to encourage people to change their behaviour, even if the new behaviour has advantages over the old behaviour (Kollmuss and Agyeman, 2002). Kollmuss and Agyeman argue that old habits are the strongest barriers to influencing pro-environmental behaviour and this is often overlooked in the literature. The present study offers a way to improve information-based initiatives to encourage pro-environmental behaviour, as this study indicates that increasing the salience of implicit environmental norms and making people more aware of their own everyday behaviours may lead to behaviour change. This is not to say that information-based approaches to change behaviour are of no use, because they can inform people of the importance of protecting the environment (Lorenzoni, Nicholson-Cole and Whitmarsh, 2007). Thus, a potential approach to encouraging pro-environmental behaviour would be to provide people with environmental protection information in addition to quizzes or questionnaires that prompt individuals to question their own behaviours.

7.3 Methodological contributions

Findings from this research have potential practical application in the development of future research using the social norms approach and contribute to our understanding of using a social norms intervention to encourage pro-environmental behaviour change. These methodological contributions to the field of social norms research are discussed in the following sections.

7.3.1 Using a social media app to deliver social norms feedback

To the researcher's knowledge, this is the first social norms intervention in the UK that has used a bespoke Facebook app to deliver personalised individual and social norms feedback on people's environmental behaviours. This study shows that social media apps can be used to deliver personalised individual and social norms feedback on people's behaviour and to encourage people to engage with feedback in some way. Participants actively engaged with the personalised individual and social norms feedback delivered by the iGreen app. In the interviews, both types of feedback were recalled. The amount of digital apps that have been assessed to deliver a social norms intervention is limited (e.g. Foster, Linehan and Lawson, 2011; Ridout and Campbell, 2014). The current study suggests that this is a simple, inexpensive and engaging method for increasing salience and encouraging pro-environmental behaviour change, and this should be explored in future research.

7.3.2 Using questions to encourage pro-environmental behaviour change

Earlier in this thesis it was argued that research using a question-answering process to encourage behaviour change in the social norms field has been overlooked. The present study contributes to this field by suggesting that answering questions about one's own behaviours can influence subsequent behaviour. For example, this study suggests that quiz questions can make people aware of their everyday behaviours and that this can lead to more pro-environmental behaviour. In chapter three, it was stated that extensive research shows that questioning people about future behaviours influences the performance of those behaviours (Sherman, 1980; Sprott *et al.* 2006; Wood *et al.* 2014). The current study extends the literature by suggesting that questioning people about *previous behaviour* may lead to reflection on their behaviour and to subsequently change them. The iGreen quiz questions related to the previous week (*e.g. last week, how often did you turn off the tap whilst cleaning your teeth?*) and seemed to make participants aware of their behaviours and create new more sustainable behaviours. Previous research has shown that norms are likely to influence behaviour when they are salient in consciousness (Cialdini *et al.* 2006), and the current study suggests that questions can be used to increase the salience of norms associated with pro-environmental behaviour. This raises the question of whether increased salience may account for some of the behaviour change found in previous social norms research. Future social norms research would benefit from including questionnaires on participants' own behaviours as questions seem to raise awareness of established environmental norms associated with everyday behaviours.

7.3.3 Discourse analysis and the social norms approach

As discussed earlier in this thesis, discourse analysis in the environmental domain is important because discourses shape the way people interpret and address environmental issues (Dryzek, 2005). It is important to interpret the implications of different discourses, which the current study aimed to do. There is some research that has examined the environmental discourses and the discourses that people use in response to environmental issues (e.g. Dryzek, 2005; Hobson and Niemeyer, 2011) but there does not seem to be any research that uses discourse analysis to understand people's response to personalised individual and social norms feedback on their environmental behaviours. Analysing the discourses respondents use in their talk concerning their response to social norm interventions can provide an insight into the meanings that underlie their behaviour change, and into the norms and conventions that may or may not encourage them to behave in environmental ways (Van Dijk, 1990).

Elements of a discourse analysis approach was used to better understand the interview transcripts and reflect on why the social norms approach did, or did not impact on participants' behaviour. Influenced by Hobson's work (2001, p.202) in this study the interview talk was not treated as verbalisations of inner beliefs, but instead analysed to understand participants' justifications for behaviour change and examined how they made use of particular discourses. This discourse analysis approach provides a more in-depth understanding of research interviews rather than simply reporting what participants said. Identifying and analysing the discourses respondents used in their talk concerning the iGreen intervention and their everyday behaviours that impacted on the environment provided an in-depth understanding of the established and underlying social norms that influenced their behaviours.

Use of a discourse analysis approach in the field of social norms research is scarce. Social norms research usually focuses on testing the efficacy of social norms rather than how people respond to social norms feedback (Cialdini *et al.* 2006). Social norms research, including the current study, that rely on self-reports cannot ascertain if participants changed their behaviour. Self-reporting has been criticised for its lack of accuracy, the disparity between verbal reports and observations of actual behaviour and influenced by socially desirability bias (Edwards, 1957; Corral-Verdugo, 1997). Nevertheless, using discourse analysis techniques in this study enabled an in-depth exploration of why social norms did or did not influence participants' behaviour and drew out other aspects of a social norms intervention that may encourage pro-environmental behaviour change.

There is much debate on what we can understand from the discourses people use and whether people's talk reflects a true expression of their thoughts, experiences or behaviour[1]. The conclusions in this thesis are based on the assumption that there is a connection between the discourses people use and their attitudes and actions. The researcher assumed that participants' talk concerning how the iGreen intervention influenced their behaviour and the rhetorical functions they employed provided some insight into what influenced them to think about environmental behaviour and the way in which they responded to iGreen. The researcher attempted to remain reflective when analysing participants' talk and the interpretations made from their talk was done tentatively. Although there are limitations of using such an interpretivistic method, it nevertheless offers a new perspective on the social norms approach to behaviour change.

7.4 Critical reflections on the research

The findings discussed earlier in this chapter highlighted the possible barriers to pro-environmental behaviour change that social norms interventions might experience. This section critically reflects on the research methodology used in the iGreen intervention and provides suggestions for improvements that future social norms interventions may benefit from.

A potential limitation of this study was the environmental framing of the app. It is likely that this framing led to a biased sample. For example, Facebook users that have an existing interest in environmental apps may have adopted iGreen, and therefore were more likely to change their behaviour in pro-environmental ways. Participating in environmental research and answering questions about one's own behaviours may have also led some participants to give socially desirable responses in order to create a more favourable impression (Edwards, 1957; Crowne and Marlowe, 1960). Some participants will probably have inferred the purpose of the research from the quiz questions and reported that they changed their behaviours because they assumed this was the intention of the study (Tourangeau, Rips and Rasinski, 2000). However, it was apparent from the interviews that participants felt comfortable to talk openly as many of them claimed that they had not changed all of the behaviours included in the quiz. Some participants also questioned the credibility of the social norms feedback and suggested areas for improving it, as well as other aspects of iGreen, such as more enjoyable games and reducing the amount of times they had to

[1] See discussion in chapter three

complete the quiz. Therefore, although the sample may be biased, the intervention nevertheless led to some interesting and surprising findings.

Another limitation of this study is that the sample lacked representativeness. Although over 2,800 people downloaded iGreen, only 51 participants completed all seven quizzes. Most participants dropped out after taking the first quiz, and this large drop-out rate may have been partly due to the iGreen app only appealing to a particular type of Facebook user. The repetitive nature of the quizzes could be a methodological limitation. For example, some of the interviewees said that the repetitive nature of the quizzes was boring, and this may have affected others from completing all of them. Some of the interviewees stated that they did not believe that they would win the prizes, and therefore prizes may not have been an adequate incentive to retain users. Participants may have also been less committed to completing the quizzes as a result of the absence of a researcher or recruiter who may have encouraged participants to commit to the study. A higher response rate might have been achieved if private messages were sent to participants via Facebook personal messages. For example, Ridout and Campbell (2014) found that personal messages via Facebook were effective in reaching participants and this seemed a better way to encourage them to commit to the social norms approach study.

In this study, the iGreen app could only be accessed by a computer or laptop connected to the internet. This was a limitation in the sense that people were restricted to using the app on a computer rather than, for example, mobile devices. Use of digital apps on mobile devices are exceeding those on computers and laptops (Ridout and Campbell, 2014), and this may have also affected the iGreen quiz completion rate. Future research could examine the use of mobile digital apps to provide regular feedback and raise people's awareness of their own behaviours. The advantage of using mobile digital apps is that they could enable feedback to be visible whenever the participant uses the app, they would be able to refer back to it, and it would be more easily accessed.

A potential issue with the design of iGreen was that it may have been too demanding to require to answer the quiz questions relating to behaviours they had done the previous week (e.g. *last week, how often did you leave the tap on whilst washing up?*). This may have been too demanding for participants in regards to recall due to the effects of time and memory (Corral-Verdugo, 1997). Frequent behaviours tend to be poorly represented in memory, and this can produce less accurate responses (Schwarz and Oyserman, 2001). This study did not assess actual behaviour but explored

participants' self-reports about their behaviour and it would be useful for future research to include direct observation which will complement the self-report data.

In this study, the social norms feedback did not seem to have an impact on participants' behaviour. It is possible that the limited support for the social norms feedback influencing participants' behaviour is a consequence of its design. As discussed in the previous section, the social norms feedback related to the sample rather than participants' Facebook friends. Participants may have questioned the credibility of the feedback because they did not know who the feedback related to or how many people it referred to. Future research using social media apps to deliver social norms feedback would benefit from first researching which specific people individuals consider their close friends on social media apps to be and base the feedback on these people. Therefore, an important agenda emerging from this study is to identify relevant reference groups on social media platforms and to better understand whether this can influence participants' behaviour. Another recommendation for future social norms research would be to consider adding specific information on the specific people that the social norms feedback is related to in addition to figures (how many people the feedback is based on), which will increase the credibility of the feedback and potentially improve the impact of it.

7.5 Recommendations for future research

The findings in this study highlight several areas for future research in the field of the social norms approach to pro-environmental behaviour change. A recommendation for future research is to design interventions more personally relevant to individuals that focus on their own behaviour. In this study, the iGreen quiz focused on participants' *own behaviour* and this appeared to make participants create associations between their behaviour and its impact on the environment. Many scholars have shown the limitations of information-based strategies (Blake, 1999; Hobson, 2001a; Kollmuss and Agyeman, 2002; Lorenzoni, Nicholson-Cole and Whitmarsh, 2007), and some have highlighted problems with using social norms to encourage pro-environmental behaviour change (Kinzig *et al.* 2013). In this study, participants were not provided with environmental information or social norms feedback alone; instead they were questioned on their everyday behaviours via a social media quiz *and* provided with personalised individual and social norms feedback. The quiz questions appeared to encourage participants to create associations between their own behaviour and environmental consumption. Extensive research has demonstrated the importance of questioning as a social influence technique (Sherman, 1980; Sprott *et al*. 2006), and the current study suggests that questioning people on their past behaviours can encourage socially desirable

behaviour. Future research should exploit this idea and can do so by using various methods, such as quizzes and questionnaires. Social norms research and pro-environmental behaviour change initiatives should consider using methods that prompt engagement with both personalised individual and social norms feedback and environmental issues that have meaning in people's everyday lives, rather than placing emphasis on environmental information or social norms messages alone.

This thesis illustrates some challenges of applying the social norms approach to encourage behaviour change. This research suggests that the social norms approach faces problems when perceived norms of a particular behaviour conflicts with people's preferred social identities. For example, the findings in this study suggest that some pro-environmental behaviour change is restricted by implicit norms and conventions about what *green people* do and what *normal people* do. These established norms associated with pro-environmental behaviour introduces challenges for the social norms approach to encourage behaviour change. For example, they can influence the way people perceive *green people* and those who partake in particular 'green' activities, which in turn can influence the uptake of those activities. Future research of this type would benefit from taking steps to reduce the negative judgements associated with particular 'green' behaviours and depicting them as normal the way in which recycling, for example, is now generally considered normal (Kinzig *et al.* 2013). It seems that some 'green' behaviours conflict with the social norms of some people's social identity. However, this may also apply to other behaviours that the social norms approach attempts to change, such as reducing drug use in students. In some cases, not taking drugs could be considered *not normal* if it is not consistent with the social identity that one aspires to (or to one's in-group). The current study suggests that the perceived norms of out-groups can prevent the adoption of some behaviours. Therefore, future social norms approach research should take more account of social identity and how it may affect the approach's efficacy to encourage behaviour change. This thesis highlighted the difficulties of using the social norms approach to encourage pro-environmental behaviour change where established 'green' discourses shape the way people interpret environmental issues; this, it suggests, may prevent the adoption of some environmental behaviours.

This thesis illuminates the potential of using a discourse analysis approach in future research on encouraging pro-environmental behaviour. Further research on the discourses identified in this thesis could reveal more interesting and useful insights in the context of using social norms to encourage pro-environmental behaviour. For example, do these discourses appear in other research

on the social norms approach to encouraging pro-environmental behaviour change? Can the discourses suggest a way in which individual and social norms feedback can be improved and targeted at particular groups? Future research that addresses such questions can potentially provide a better understanding on the influence of social norms on pro-environmental behaviour. More research is required that focuses on people's talk and the discourses that they use to explain their behaviour change and to identify barriers to adopting some environmental behaviours. Examining the environmental issues in people's discourses and their everyday behaviours can potentially bridge the gap between environmental awareness and environmental behaviour.

7.6 Conclusion

This study has demonstrated a novel and innovative approach to explore the efficacy of the social norms approach to encourage pro-environmental behaviour. Incorporating a social media app, qualitative interviews and a discourse analysis enabled the in-depth examination of a social norms intervention. This richness of combining data and its subsequent interpretation uncovered a diverse range of insights that has potential practical application in the design of innovative social norms interventions.

This thesis identified key elements of a social norms intervention that can increase its potential to encourage pro-environmental behaviour. The main contribution of this research is the discovery that increasing the salience of people's everyday behaviours can encourage pro-environmental behaviour. A digital quiz is a simple and engaging method for increasing salience and encouraging behaviour change, and this should be explored in future research.

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Appendices

Appendix A- Quiz for Facebook Application iGreen

*Please answer the following questions, thinking about what you did **last week.***

1. How many baths or showers did you take?
2 or less
3 - 4
5 - 6
7 - 8
9 – 10
11 or more

2. How often did you turn off the tap whilst brushing your teeth?
Every time
Most times
Quite often
Sometimes
Once or twice
Never

3. How many of your clothes did you re-wear before washing?
All of them
Nearly all of them
Most of them
Some of them
A few
None

4. How many of your main meals (including breakfast) contained no meat or fish?
All meals
Most meals
Many meals
Some meals
A few meals
None

5. How often did you drink mineral water?
Every day
Most days
Quite often
On a few occasions
Once
Never

6. How often did you take your own shopping bag(s) when you went to the supermarket?
Every time
Most of the time
Quite often
On a few occasions
Once
Never

7. How often did you throw away an item that you knew could have been recycled?
Every time
Most of the time
Quite often
On a few occasions
Once or twice
Never

8. How often did you switch the TV off rather than leave it on standby?
Every time
Most times
Quite often
On a few occasions
Once or twice
Never

9. How often did you leave the tap on whilst doing the washing up?
Every time
Most times
Quite often
On a few occasions
Once
Never

10. How often did you leave your mobile phone charger switched on at the socket when not in use?
All of the time
Most of the time
Quite often
On a few occasions
Once or twice
Never

11. How often did you leave the lights on when you left a room for a long time? (including hallways and corridors)
Every time
Most times
Quite often
On a few occasions
Once or twice
Never

12. How often did you leave your PC or laptop on for more than a couple of hours at home, when not in use?
All of the time
Most of the time
Quite often
On a few occasions
Once
Never

13. How often did you boil only as much water as necessary?
All of the time
Most of the time
Quite often
On a few occasions
Once or twice
Never

14. How often did you take public transport, walk or cycle to school, work, college or social/recreational activities?
All of the time
Most of the time
Quite often
On a few occasions
Once
Never

15. How often did use a car for short journeys?
a) All of the time
b) Most of the time
c) Quite often
d) On a few occasions
e) Once
f) Never

Appendix B- Post-Intervention Questionnaire

1. Your Surname/Family name

2. Your First name

3. Your e-mail

4. How easy/difficult was it to use the application?
Very easy
Easy
Difficult
Very difficult
Don't know

5. How much did you enjoy playing the games?
Very much
Quite a bit
Not much
Not at all
Don't know

6. How much did you enjoy taking the quiz?
Very much
Quite a bit
Not much
Not at all
Don't know

7. How much did you like the application overall?
Very much
Quite a bit
Not much
Not at all
Don't know

8. Why did you use iGreen? Please rate the following in order of importance:
For fun
To win the prizes
To do the quiz
To unlock the games
Interested in the environmental theme
My friends were using it
Other, please specify:

9. Do you belong to any green Facebook groups?
Yes, please specify which ones:
No

10. How concerned are you about environment change (sometimes referred to as 'climate change' or 'global warming')?
Very concerned
Fairly concerned
Not very concerned
Not at all concerned
No opinion

11. Thinking about the quiz, how carefully did you think about each of the questions before answering them?
A great deal
Quite a bit
Not much
Not at all
Don't know

12. In between taking the quizzes, to what extent did you think about the answers you were going to give in the next quiz?
To a great extent
To some extent
Not much
Not at all (If not at all, skip to question 14)
Don't know

13. If you did think about the questions in between the quizzes, what did you think about in particular? Please select ALL that apply:
Recycling
Using water
Eating vegetarian meals
Buying bottled water
Using electricity
Using the car
Taking your own shopping bags
Other, please specify:

14. To what extent do you agree/disagree with each of the following statements:
During the study, I changed my behaviours because of…
What I learnt about how my friends behave
What I learnt about my own behaviour
The games I played in iGreen
Because I knew I was going to be asked about my behaviour in the next iGreen quiz
Doing the iGreen quizzes did not lead me to change my behaviour at all

(with options strongly agree, agree, disagree, strongly disagree, don't know)

15. Since using the application, have you changed your behaviour in any of the following ways? Please select all that apply.
Using less water (i.e. when showering/washing clothes less/washing up/whilst brushing teeth)
Eating more vegetarian meals
Taking your own shopping bags
Recycling more
Using less electricity (i.e. turning TV, PC, lights, mobile phone charger off when not in use)
Walking or taking public transport more often
Buying less bottled water
Other, please specify below:

16. To what extent do you think the application made you more aware of how your behaviours effect the environment?
A great deal
Quite a bit
Not much
Not at all (if not at all, skip to q18)
Don't know

17. What was it about the application that made you more aware of how your behaviours effect the environment? Please select all that apply to you.
The games
The quiz
The images and pictures
The smiley faces
What I answered the last time I took the quiz
What my friends said
The theme of the application
Other, please specify:

Finally, please answer some questions about yourself: (these are closed questions with options)

18. Age

19. Sex

20. Ethnicity

21. How many people do you normally live with?

22. What are your current living arrangements?

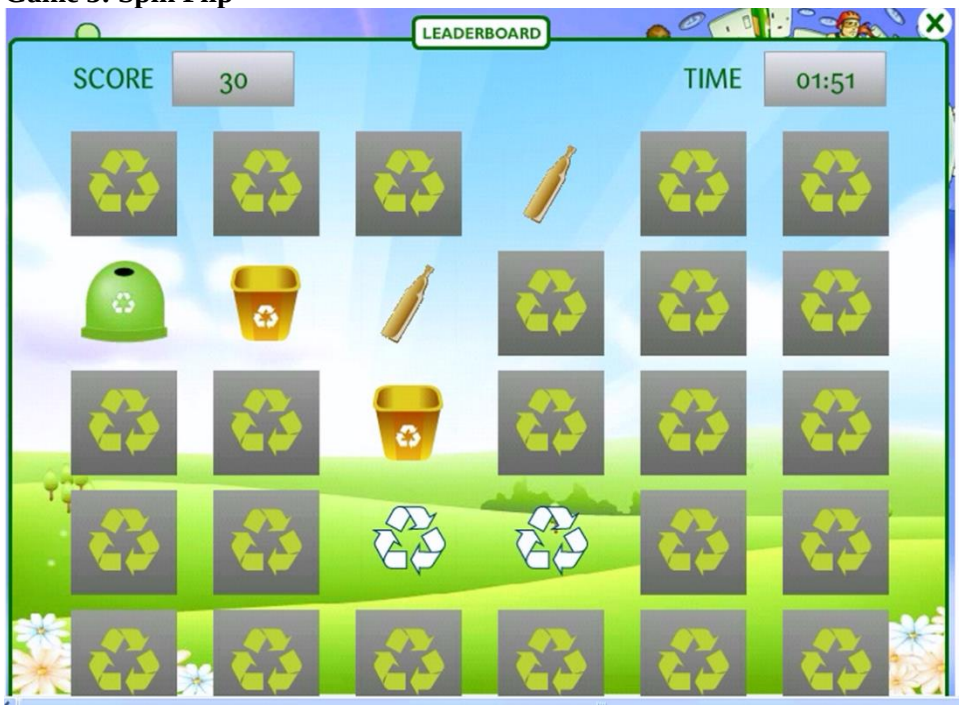
23. Where are you currently living?

Appendix C- Examples of iGreen Games

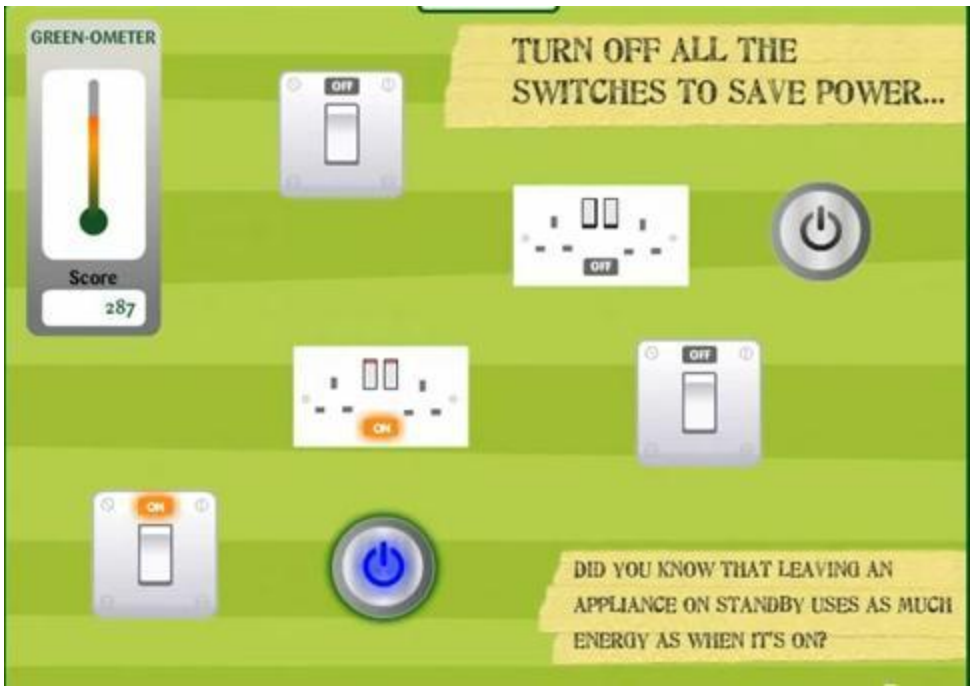
Game 1: Recycle Mania

Game 2: Cycle City

Game 3: Spin Flip



Game 4: Switch Swatch



Game 5: Rubbish Run

Game 6: Rejuvenation Island

Game 7: Icecapades

Appendix D- Interview topic guide

Introduction and consent
Introduce self
Explain about audio recording and confidentiality
Obtain consent

Demographics and living arrangements
Tell me about yourself

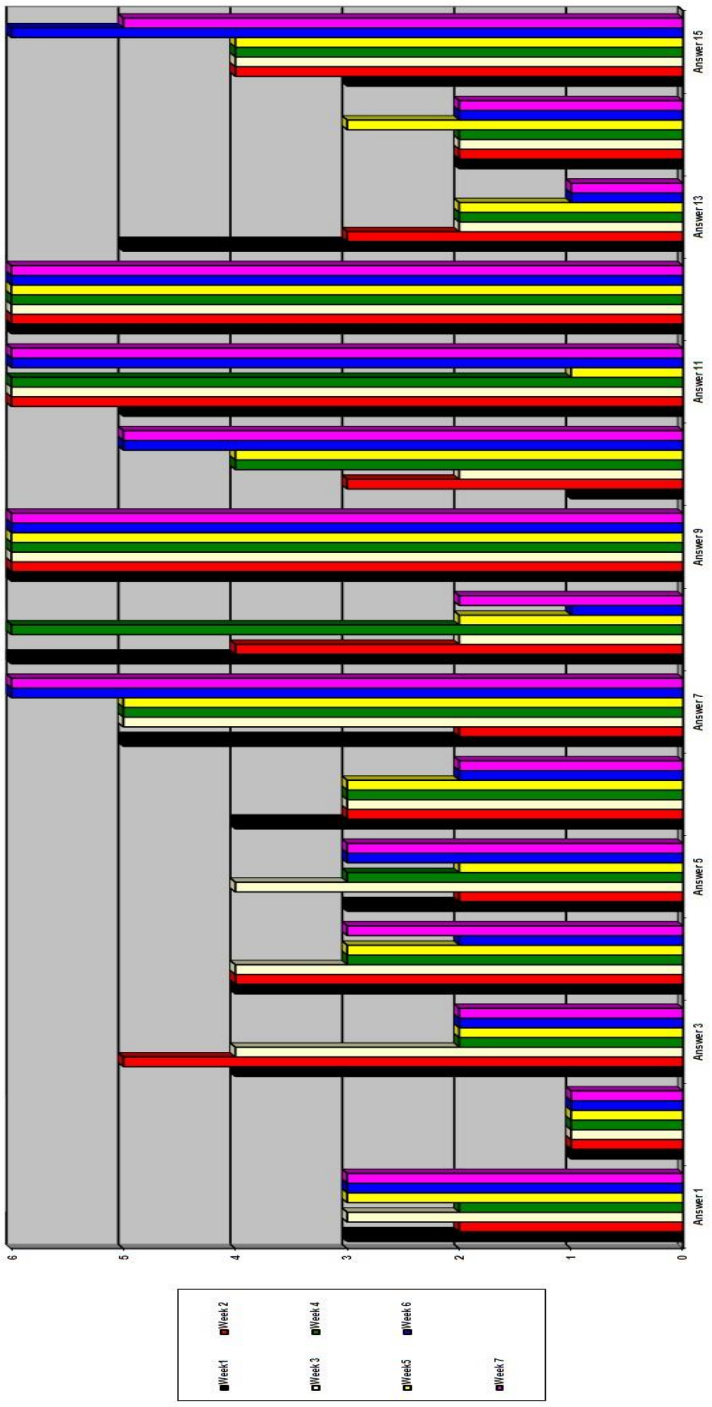
Facebook & iGreen
Tell me how you use Facebook
What did you make of iGreen

Feedback and behaviour changes
Notice feedback about previous answer?
Individual Feedback influence *answers*? Why? What in particular.
Individual Feedback influence *behaviour*? Why? What in particular.
Notice friend's feedback- If yes, how did the feedback affect them.
Social Feedback influence *answers*? Why? What in particular.
Social Feedback influence *behaviour*? Why? What in particular.
How did they feel about receiving both types of feedback- Why?
Did they notice smileys? How did they affect them and why.
How did they feel about the smileys- reasons.
Awareness- more/less aware of the things they did in regards to the environment- if so: HOW? WHY? WHEN? IN BETWEEN QUIZZES? AFTER A QUIZ? NOW?
Did answers change over 7 weeks - reasons.
Since using iGreen, any changes to the things they do that effect the environment. If so, WHAT? WHY? WHAT DID THEY DO BEFORE? ARE THEY SLIPPING BACK?
What would they never change? Why?
If nothing changed, why do they think this is? How would they feel if it changed?
Concerned about someone reading their answers?

Sustainability (questions to be asked to all participants):
Interested or concerned about climate change/global warming?
What kind of things do they do? Why? (Influences)
Friends/family interested in or concerned about it?
What kind of things do they do.
Does what they do influence/effect them (Why, In what ways)
Are they more or less concerned about the environment than friends/family.
Anything they would like to be different in the future.

Reason for using participating:
Reasons for using use iGreen. Anything else they would like to add.

Appendix E- Example of participant's quiz answers chart for interview



Appendix F- Terms and Conditions: iGreen Facebook Application

Allowing iGreen access will let it pull your profile information, photos, your friends' info, and other content that it requires to work.

Immediately after this those who download the application will see:

This application will be used to collect data for a research study to understand more about sustainable behavior. Your scores will be included in a calculated average and shown to your friends. Your scores will be included in the study, but will be completely anonymous and remain entirely confidential throughout and after the study. We may send a Facebook message to a small number of players to see whether they are interested in being paid to take part in an interview.

Those who are less than 18 years old according to their Facebook profiles will not be able to download the game

Appendix G- Research Interview Consent Form

Research Interview Consent Form

Thank you for agreeing to be interviewed for the iGreen study.

This signed consent form confirms that you agree:

To be interviewed by Kavita Patel (the researcher) as part of the iGreen study and Kavita's PhD research
To allow the researcher to record the interview and have it transcribed
To allow the researcher to use this transcript in the analysis and reporting of the study, subject to the following conditions:
Your comments will remain confidential and anonymous at all times
You may terminate the interview at any time.

I consent to being interviewed as part of the iGreen Study

Your name _____

The first line of your address _____

Your signature _____

Date _____