The Influence of Habits, Opportunities and Thoughts on Environmentally Sustainable Lifestyles

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Abstract

This programme of research was focused on developing a better understanding of pro-environmental behaviours and pro-environmental behaviour change, with consideration of the powerful effect of habits in thinking, affect and behaviour. Habit networks are discussed with reference to HOT topics (Habits, Opportunities and Thoughts), and explored empirically within the context of the FIT Framework (Fletcher & Stead, 2000). This programme of research started with a literature review on established models of pro-environmental behaviour. It found a large degree of similarity in the approaches used to conceptualise pro-environmental behaviour, and suggested the need to explore pro-environmental activity from different perspectives. The FIT Framework was then presented as an alternative approach. FIT variables measure the strength of an individual's cognitive characteristics and their degree of behavioural flexibility using the FIT Profiler (Fletcher, 1999).

The empirical studies presented in this programme of research suggest that levels of personal FITness are related to engagement with pro-environmental activity and the extent to which lifestyles are environmentally sustainable. Study 1 (N = 325) explored the relationships between FITness and measures of pro-environmental activity, and Study 2 (N = 134) sought to confirm these relationships in a different sample. Both studies found positive relationships between levels of personal FITness and pro-environmental activity. Based on these results, it was suggested that FIT offers a useful alternative framework to study pro-environmental activity.

Studies 3 (N = 75) and 4 (N = 100) considered the performance of pro-environmental behaviours in different sites of practice, as follow-up to the differences that emerged in Studies 1 and 2. They also explored the perceived influence of intrinsic and extrinsic variables on energy saving in home and work settings. The results suggested that the pro-environmental behaviours that are performed at home are often not transferred to the workplace and this might be because extrinsic factors in an organisational setting constrain action. Higher levels of personal FITness helped to align behaviours with intrinsic beliefs; individuals with higher levels of FITness behaved as they felt they ought to, whereas individuals with lower levels of FITness behaved as they were told to. It was suggested, therefore, that higher levels of FITness might support behavioural consistency across contexts.

Study 5 (N = 95) explored the extent to which pro-environmental behaviours are characterised by habit and how the strength of habit changes according to level of personal FITness. The

results suggested that people act pro-environmentally within distinct behaviour categories and this has little or no bearing on their propensity to behave in an environmentally friendly way in other areas. Habits can have a positive influence on the performance of pro-environmental behaviour but a negative influence on behaviour change. The empirical results suggest that a higher level of FITness might help people to engage more readily with pro-environmental behaviours that are performed less frequently. It was, therefore, suggested that developing levels of personal FITness might help individuals to extend their behavioural repertoire and be sufficiently flexible to include more pro-environmental behaviours, including those that are, at present, characterised less by habit.

A second literature review on interventions for pro-environmental behaviour change found that many techniques have been developed from the perspective of bounded rationality and have assumed that the provision of information will initiate behaviour change. These approaches are often ineffective because of the resistive effects of habit. In light of this and the findings of the empirical studies, a FIT-based behaviour change intervention, named here as Do Something Greener, was developed as an alternative approach to address directly the problem of habit.

Overall, this programme of research suggests that the influence of habits, opportunities, and thoughts should be considered in the study of pro-environmental activity. Further research exploring the effectiveness of Do Something Greener for pro-environmental behaviour change is necessary and planned as the next step in this programme of research.

By exploring pro-environmental behaviour from a different perspective, it is hoped that this programme of research has also challenged some of the habitual tendencies that researchers are themselves starting to develop in relation to the study of pro-environmental behaviour, and that it has added a degree of eclecticism and pragmatism to psychological approaches to pro-environmental behaviour change. It is hoped that this will help to set a more practically oriented agenda for future research.

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1 Models of Behaviour and Behaviour Change

1.1 Introduction

This programme of research is focused on developing a better understanding of pro-environmental behaviour and pro-environmental behaviour change, for the development of environmentally sustainable lifestyles. This research seeks to develop new and relevant understandings about the variables and processes that relate to environmentally sustainable choices and behaviours. It also explores the factors that might help people to change their lifestyles to be more environmentally sustainable. This research sits within the field of environmental psychology, a discipline that seeks to develop a better understanding of the interplay between people and their built and natural environment (Steg, van den Berg & de Groot, 2013). It seeks to offer an alternative approach for pro-environmental behaviour change, to help people to reduce the impact of their behaviour on the environment.

The overall aims of this programme of research are as follows:

- to review the literature on popular and historical models of behaviour and behaviour change, and consider broadly their application and effectiveness to pro-environmental behaviour change for the development of environmentally sustainable lifestyles,
- to develop a better understanding of the relationships between cognitive, behavioural and affective characteristics, and pro-environmental activity. These characteristics will be outlined in the FIT Framework (Fletcher & Stead, 2000),
- to consider the influence of contextual factors on pro-environmental activity, and explore how pro-environmental behaviours differ according to site of practice,
- to consider the influence of habits, opportunities, thoughts, and flexibility on pro-environmental behaviours, and resistance to change,
- to review the literature on popular and historical interventions for pro-environmental behaviour change and,
- to propose, based on the insights of the literature reviews and the results of the empirical studies, a new framework for pro-environmental behaviour change that targets directly the resistive effects of habit.

An environmentally sustainable lifestyle is defined here in accordance with the definition given by the World Commission on Environment and Development (WCED, 1987) as one that attempts to be less carbon impactful by using as little as possible of the Earth's natural resources. It involves making choices and performing behaviours that are less carbon intensive

so that the present ecological, societal, and economic needs can be met without compromising these factors for future generations.

1.2 Climate Change – A Psychological Problem

There is now very little, if any, doubt regarding the connection between human behaviour, carbon emissions and changes to the world's climate. The scientific evidence surrounding climate change has grown considerably over the past three decades following the UN Conference on the Changing Atmosphere in 1988. More recently, a report compiled by an international consortium of scientists, the largest of its kind to date, has suggested that the large majority of climate researchers agree that human activity is contributing to global warming (Intergovernmental Panel on Climate Change Assessment Report 5 [IPCC AR5], 2013; Doran & Zimmerman, 2009). Moreover, the IPCC also suggest that human behaviour is responsible for more than half of the observed increases in the climate (IPCC AR5, 2013).

Despite the increasing scientific evidence, which presents a consistent message about the relationship between changes to the earth's climate and human behaviour, it seems that many people still remain either unaware, in denial, or otherwise disengaged from the problem of climate change. This is reflected in the fact that UK energy consumption relating to transportation and households has continued to rise in recent years (Department for Environment and Rural Affairs [DEFRA], 2006; notwithstanding some small drops recently, largely as a result of the financial recession), and only a minority of people are taking action to mitigate the effect (Whitmarsh, 2009). Even people who espouse green values and have a strong sense of environmental concern, those who are of a 'greener' disposition, do not act pro-environmentally in accordance with their values and beliefs (Shove, 2010; Hinkel, Fox-Cardamone, Haseleu, Brown & Irwin, 1996). It seems that pro-environmental beliefs, values, and intentions, do not always translate to pro-environmental behaviours or environmentally sustainable lifestyle practices. This disconnect has been widely documented and is often called the value-action gap (Blake, 1999). Overall, it seems that for most individuals, daily life continues in a way that is environmentally unsustainable. Furthermore, a lack of behavioural response might be further augmented in the future when technology is deployed globally to aid mitigation of climate change. Automated technology impairs personal responsibility for action (Murtagh, Gatersleben, Cowen & Uzzell, 2015).

There are a variety of broadly psychological questions – that is, questions relating to human cognition, affect, and behaviour – that arise in relation to climate change and environmental sustainability. These include, amongst others: Do people have a realistic awareness of the

scientific evidence showing the relationship between human behaviour in general and changes to the earth's climate? If so, how does this make them feel? How aware are people of the effects of their own personal behaviour and the ways that it is environmentally unsustainable? In this regard, how aware are people of the alternative behavioural options that are available to them? And how willing and capable are people of changing their behaviour in the cause of improved environmental sustainability (explicitly acknowledging here the distinct difference between willingness and capability)? It is clear that these questions, and the answers to them, present a set of interrelated psychological challenges to researchers who seek to understand better the relationships between people and their changing environment.

1.2.1 Some of the Challenges Faced by Environmental Researchers

Perhaps one of the biggest challenges facing environmental researchers is getting engagement from people who accept anthropogenic climate change (55-60%, according to DEFRA, 2009; Spence, Venables, Pidgeon, Poortinga & Demski, 2010) but who are inactive in this domain despite stating that they want to do more to help the environment. Among the majority who accept the existence of climate change and its relationship with human behaviour, it might be that one of the primary challenges for practical pro-environmental behaviour change is a lack of attention and/or awareness, with this lack evident at two related levels. Dealing with attention first, people are very often sufficiently focused on activities related to their core proximal goals that they pay little or no attention to the environmental consequences of those activities, these being of secondary concern at best. This has been referred to previously as being somewhat akin to what is called in the perceptual and cognitive domain, "attentional blindness" (see Page & Page, 2011; Page & Page, 2014a). Therefore, a necessary first step in encouraging pro-environmental behaviour is to establish environmental concerns in the "attentional set" of the target audience. This might involve, for example, encouraging people to pay active attention to their current behaviours and the impact that these have, as well as to the alternative, more environmentally sustainable behaviours that are available. In the absence of such an attentive and informed stance, it is difficult to see how behaviour-change options will get even a foothold, let alone be successfully implemented.

For people, who are in principle, open to change, another important aspect to consider in relation to pro-environmental behaviour change is their personal belief that they are even capable of changing their behaviour – an individual's level of self-efficacy (Bandura, 1994). This is an important consideration, as the extent to which people believe that their specific efforts will be successful helps to determine their behavioural motivation. Without a sufficient level of

self-efficacy, people might avoid attempting a specific behavioural change because they do not believe they are capable of its successful implementation. For this reason, it is suggested that a second key step in any intervention seeking to encourage pro-environmental behaviour change involves developing intrinsic beliefs relating to self-efficacy, so that people feel confident and empowered to take a different course of action. A third related issue concerns ensuring that people have sufficient behavioural skills and abilities to take appropriate action. This might involve the weakening of existing habits and development of new behaviours.

A final point worth mentioning relates to the researchers who seek to develop a better understanding of pro-environmental behaviour. It is suggested that it is not only "other people" who need to be attentive to alternative courses of action. Psychologists and behavioural researchers (myself included) might also need to broaden their own "attentional set" and take an alternative approach towards pro-environmental behaviour. It will become evident throughout the review that a large majority of the theoretical and empirical research on pro-environmental behaviour has become rather fixated on developing the validity of an established theory often at the expense of its usability. By focusing on what they already know, researchers are themselves liable to become inattentive to more novel approaches (see also Ogden, 2014). With this challenge in mind, this programme of research introduces a relatively novel framework of behaviour change – called the Framework for Internal Transformation (FIT; Fletcher & Stead, 2000) and considers its adaption and application to pro-environmental behaviour. Chapter 2 will describe the FIT Framework in more detail and consider its relevance to pro-environmental activity.

One way of broadly conceptualising some of these challenges is through a framework that I have called Habits, Opportunities and Thoughts (HOT topics; Page & Page, 2011), and that I now describe.

1.2.2 The HOT Topics Framework

The HOT topics framework (Page & Page, 2011) describes a network of habits in thinking, affect, and behaviour that might restrict pro-environmental action and be resistive to change attempts. Starting at the behavioural level, many daily behaviours, both 'green' and non-'green', are characterised by habit. Habit theory (Verplanken, Aarts & van Knippenberg, 1997; Verplanken, Aarts, van Knippenberg & van Knippenberg, 1994) explains that when behaviours are characterised in this way, they become "scripted" and are performed automatically in response to environmental cues, rather than deliberate decision processes (Fujii & Garling, 2003). Their automaticity means that people are often less cognitively alert and can develop

"tunnel vision" (Walker, Thomas & Verplanken, 2014) and restrict the range of information that they consider (see Danner, Aarts & de Vries, 2007; Danner, Aarts & de Vries, 2008). This, in turn, might manifest in them being less aware of their actions, the environmental impact that these have, and the alternative behaviours that are available. They might also be less responsive to behaviour change information. In other words, people are less aware of, or less responsive to, the opportunities that are available to them. Furthermore, such a restriction might lead individuals either to believe that they have no choice or ability to change their behaviour or to respond with automatic negative appraisal of any suggested behavioural alternative. Such negative automatic thinking or more specifically, negative environmental thinking, can impair significantly personal beliefs in one's ability to change, in other words, one's personal levels of self-efficacy (Bandura, 1994). Without sufficiently strong personal beliefs or positive thoughts about one's ability to change, people might remain in a state of inertia simply because they do not believe that they have the capability or opportunity to initiate action. There is an important asymmetry acting against behaviour change – even in the face of considerable reasons for change, it can take only one negative environmental thought to block the process entirely.

1.3 A Review of the Theories and Models of Behaviour and Behaviour Change

With consideration of the influence of habits, opportunities, and thoughts, this section broadly outlines some of the popular and empirically established frameworks of pro-environmental behaviour, and considers their validity and utility for pro-environmental behaviour change. This review will focus on some of the main psychological theories and models that have been used to define behaviour and behaviour change.

1.3.1 Defining Pro-environmental Behaviour

There are multiple and distinct types of pro-environmental behaviour that have been considered from different theoretical perspectives. These include: environmental activism; non-activist public behaviours such as environmental citizenship and support and acceptance of public policies; private environmental activism; and environmental behaviours in organisations (Stern, 2000). Several psychological theories and behavioural models have been designed specifically to explain the different types of pro-environmental behaviour and efforts at pro-environmental behaviour change (e.g., the Value-Belief-Norm theory; Stern, 2000). There are also other models of behaviour that are more generic in nature and were designed initially to explain behaviour of other types, before being applied to pro-environmental activity (e.g., the Theory of Planned Behaviour; Ajzen, 1991; 2014). Regardless of their origin, each

model places a different emphasis on the factors that might influence performance of pro-environmental behaviour. Broadly speaking, there are two different theoretical perspectives.

The first theoretical perspective places emphasis on individual agency and the individual as the locus of behaviour. From this perspective, behaviour is an outcome of competing influences that are decided upon by the individual, typically in a balanced and rational way. Accordingly, behaviour is largely determined by the strength of influence of an individual's personal affective, cognitive, and/or behaviour characteristics and (perceived) competencies. In contrast, the second theoretical perspective is focused more on the social and physical context where the behaviour is performed. This type of approach places greater emphasis on the role of context and extrinsic factors that are, to a greater extent, perceived to be outside of individual control. This review will be focused more on the former of the two. There are also theories and models that sit astride these two camps and emphasise the interplay of both individual characteristics and contextual forces. However, despite such interactions being acknowledged in the theoretical frameworks that explain pro-environmental behaviour, it could be argued that often the significance of these interactions has been underplayed in the models that seek to support pro-environmental behaviour change.

Across the theories, three main types of pro-environmental action determinant have been identified. These are broadly categorised as:

- attitudinal factors such as personal norms, beliefs, values, morals, and identity, which can influence an individual's general predisposition to act with pro-environmental intent. Research has explored rational choice (Jackson, 2005), morals and norms (Schwartz, 1977; Clayton & Brook, 2005), values (Dunlap & van Liere, 1978), emotions (Swim et al, 2009), and identity (Gatersleben, Murtagh & Abrahamse, 2012) as well as socio-demographic variables such as age and gender (e.g., Abrahamse & Steg, 2009),
- contextual factors external to the individual that exist in the social and physical environment and might facilitate or prohibit action. Research has focused on the impact of social norms and normative messaging (e.g., Schultz, Khazian & Zaleski, 2008), the role of habit and context change (e.g., Verplanken, Walker, Davis & Jurasek, 2008; Dolnicar & Grün, 2009), and technology and infrastructure (Rogers, 2003) and,
- personal capabilities such as the abilities and resources needed to adopt certain behaviours including money, time, and knowledge, and cognitive and behavioural predispositions. There has been much less research conducted in these areas.

1.3.2 The Review

The purpose of this review is to identify:

1. the different theoretical frameworks that have been applied to pro-environmental behaviour,
2. the range of variables that relate to pro-environmental behaviour and,
3. the strengths and weaknesses of different approaches in terms of their validity to pro-environmental behaviour and utility to support pro-environmental behaviour change.

Where possible, this literature review presents empirical studies that have applied the frameworks to pro-environmental behaviours and/or behaviour change.

Because there are many different theoretical perspectives, this review has been organised into three main sections. The first section presents the psychological theories that place greater emphasis on individual agency and the individual as the locus of behaviour. These approaches focus on the influence of an individual's personal affective, cognitive, and/or behavioural characteristics and (perceived) competencies. The theoretical perspectives presented in this section include: the Norm Activation Theory (NAT; Schwartz, 1977), the Value-Belief-Norm theory (VBN; Stern, 2000), the Theory of Planned Behaviour (TPB; Ajzen 1991; 2014), the Health Belief Model (HBM; Hochbaum, 1958), the transtheoretical model, also known as Stages of Change (SoC; Prochaska & DiClemente, 1983), and the Stage model of Self-regulated Behaviour Change (SSBC; Bamberg, 2013).

The second section presents those theories that place greater emphasis on the role of context and the influence of extrinsic factors. There are far fewer of these; the ones presented in this review are the Social Practice Theory (SPT; Giddens, 1984), and the Diffusion of Innovation Theory (DOI; Rogers, 2003).

The third section presents the multi-disciplinary approaches. These place greater emphasis on the interaction between individual characteristics and contextual forces. This review describes the "4 E's" model (HM Government, 2005), the energy cultures framework (Stephenson, Barton, Carrington, Gnoth, Lawson & Thorsnes, 2010), and the Comprehensive Action Determination Model (CADM; Klöckner & Blöbaum, 2010). Following the reviews, consideration is given to the value of casting the net much wider in the search for psychological techniques that might be usefully applied in this domain. Lastly, the FIT Framework will be presented for consideration as an alternative model.

This review is not exhaustive. It does not seek to describe all of the theoretical perspectives on pro-environmental behaviour; this would be a huge undertaking. What it does hope to provide is an extensive summary of the main theories that have been influential to date, in order to guide the empirical work being undertaken in this programme of research.

The first section of the review is focused on the psychological theories that emphasise the influence of personal characteristics on behaviour.

1.3.3 Psychological Theories focused on Personal Characteristics

The psychological theories focused on personal characteristics place greater emphasis on the role and influence of individual characteristics. The first four models reviewed here, which are the Norm Activation Theory (NAT; Schwartz, 1977), the Value-Belief-Norm theory (VBN; Stern 2000), the Theory of Planned Behaviour (TPB; Ajzen, 1991) and the Health Belief Model (HBM; Hochbaum 1958), are those that seek to define the possible determinants of behaviour and behavioural intention. The final two models reviewed in this section focus on the process of behaviour change from a stage perspective. They include the transtheoretical model, also known as the Stages of Change Model (SoC; Prochaska & DiClimente, 1983), and the Stage Model of Self-regulated Behaviour Change (SSBC; Bamberg, 2013).

1.3.3.1 The Norm Activation Theory

The Norm Activation Theory (NAT; Schwartz, 1977) was designed specifically to explain altruistic and helping behaviour. The underlying premise of the model is that people will help other people if they feel morally obliged to do so in a given situation. The underlying determinant of behaviour is an activated personal norm. According to the NAT, there are four conditions that need to be fulfilled to activate a personal norm, these are: (1) awareness of need – an individual needs to be aware of the need for help; (2) awareness of consequences – an individual needs to be aware of the consequences that the behaviour would have on the person in need; (3) ascription of responsibility – the individual needs to accept responsibility for his or her actions; (4) perceived behavioural control – the individual needs to perceive him- or herself as capable of performing the helping action (see Figure 1.1).

Pro-environmental behaviours have been defined as moral actions that are determined by what it is right and wrong to do (Thøgersen, 1996). Consequently, the NAT theory has been applied to pro-environmental behaviour, and with promising results (Harland, Staats & Wilke, 2007; Hunecke, Blöbaum, Matthies, & Höger, 2001). The model, however, does not capture non-moral

motivations, and has been reported to be limited to explaining repetitive behaviours such as travel mode choice and recycling (Morris, Marzano, Dandy, & O'Brien, 2012).

With consideration of the influence of habits, opportunities, and thoughts, it is also suggested here that another potential weakness for the model might be its dependency on an individual's awareness of the problem and the need to act (i.e., a person's awareness and openness to the opportunity). People do not always see features of their visual environment to which they are not attending even when the feature is embarrassingly obvious once attention is drawn to it (see Simons & Chabris, 1999). It is suggested here that low levels of awareness might pose a challenge for the NAT because if people are unaware either of the need to act or of the consequences of acting, then they will not activate their personal norm to influence behaviour.

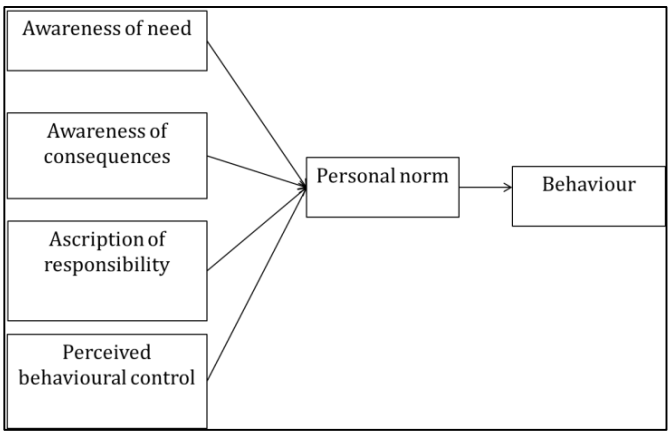


Figure 1.1. The Norm-Activation-Theory (NAT; Schwartz, 1977)

1.3.3.2 The Value-Belief-Norm Theory

The Value-Belief-Norm theory (VBN; Stern, 2000, see Figure 1.2) of environmentally significant behaviour is perhaps the most applicable and widely cited model of pro-environmental behaviour to date. It is a more inclusive framework than the NAT (Schwartz, 1977) as it identifies attitudinal factors and personal capabilities as well as the influence of contextual forces and habit. According to the VBN, the causal chain moves from core and relatively stable elements of an individual's personality and belief structure, to more focused beliefs about human-environment relations, personal norms, and responsibility to take environmentally sustainable action, be this directly active, non-activist, private (e.g., at home), public, or at work. The strength and balance of an individual's personal biospheric, altruistic, and egoistic beliefs determine an individual's overall predisposition to act with pro-environmental intent.

At the base of the causal chain are an individual's *attitudinal factors*. These include those variables such as personal values, beliefs, and norms, which can combine to influence an individual's overall predisposition to act with pro-environmental intent or ecological worldview. Three different types of value are identified: biospheric – a strong connection to the natural world; altruistic – a strong connection to other people (i.e., being pro-social); and egoistic – a strong connection to self. The strength of biospheric beliefs is said to influence an individual's personal consideration with respect to the interconnectedness between human activity and the biosphere (cf. the New Ecological Paradigm; Dunlap, Van Liere, Mertig & Jones, 2000). This might, in turn, lead to a personal motivation to avoid adverse environmental consequences. However, in order to take action, an individual must feel like they are capable of doing so (their self-efficacy), and this perception might be very different from their actual behavioural capabilities, particularly if behaviours are largely characterised by habit. It is acknowledged again, that an individual's attentional set and their personal level of self-efficacy are important in moving an individual from affect to action.

The VBN theory also recognises the influence of *contextual forces.* These include those variables in the built and social environment that are typically external to the individual such as, amongst others, community expectations, government regulation, public policy to support behaviour, and physical difficulty to perform the action provided by technology and the built environment. According to the VBN theory, contextual factors can directly facilitate or constrain behaviour and also interact with attitudinal factors to determine the environmental sustainability of action.

The third set of causal variables specified in the VBN model is *personal capabilities*. This set of variables includes the personal knowledge and skills required to perform environmentally sustainable actions, in addition to the availability of the time to act, and the general competencies and resources such as money, social status, and power. These variables again encompass aspects of self-efficacy (Bandura, 1994).

The fourth and final set of causal variables in the VBN model relates directly to *habit or routine*. Approximately 45% of our daily behaviours are habits (Wood & Neal, 2007) and environmentally sustainable actions can benefit from and be constrained by these. As described previously, habits are likely to have a significant impact on the degree to which people are aware of and (believe that they are) capable of taking action (Bargh & Chartrand, 1999; Triandis, 1977; Ouellette & Wood, 1998).

Several pro-environmental behaviours have been reported as being characterised by habit (Danner et al, 2008) and this can suppress the consideration of alternative behavioural options. For example, Danner et al (2007) found that the mental accessibility of habits increases with repetition and goes hand-in-hand with an inhibition of competing alternatives. In essence, when behaviour becomes guided by habit, the behaviour itself can happen automatically rather than be guided by attitudinal factors, with alternatives barely considered. People become unaware of their own behaviour as well as the alternative behavioural options that are available to them. These insights might help to explain why VBN variables often have a low level of validity for pro-environmental behaviours (Stern, 2000).

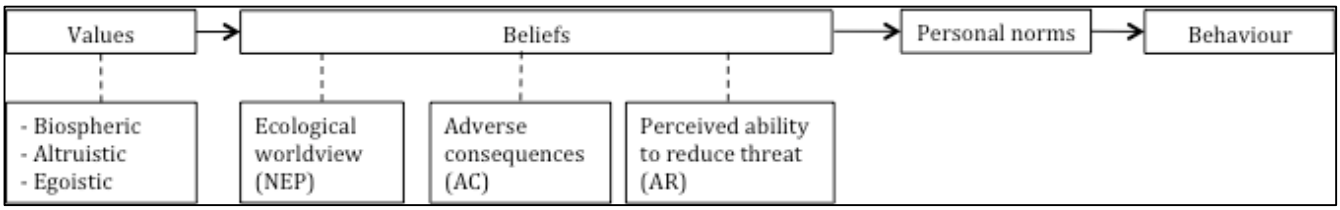


Figure 1.2. The attitudinal factors of the Value-Belief-Norm theory (VBN; Stern, 2000)

1.3.3.3 The Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB; Ajzen, 1991; 2014) is one of the most widely cited, empirically tested, and criticised models of behaviour to date (for a recent critique see Sniehotta, Presseau & Araújo-Soares, 2013). Nevertheless, it has established itself as a very popular cognitive model that seeks to predict behaviour in specific contexts based largely on an individual's attitudes and beliefs. It was first developed to explain personal health behaviour, following an extension of the Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975), but has more recently been adapted and applied to the domain of pro-environmental activity (see Donald, Cooper & Conchie, 2014; Greaves, Zibarras & Stride, 2013).

The TPB model specifies three independent antecedent determinants of behaviour, each of which are described to have an indirect effect on behaviour through their influence on behavioural intention. The determinants are: attitudes towards the behaviour, which represent beliefs about the behaviour and an evaluation of its expected outcomes; subjective norms, which reflect beliefs about the perceived social pressure to perform or not perform the behaviour and an individual's motivation to comply; and perceived behavioural control, which reflect beliefs about one's capability and control to perform the behaviour (levels of self-

efficacy). The TPB (see Figure 1.3) suggests that favourable attitudes and subjective norms, coupled with perceptions of behavioural control, lead to strong behavioural intentions and, in turn, behaviour. It is important to highlight that the TPB antecedents are specified to predict intentions to behave rather than actual behaviour. Behavioural intentions do not always relate with behaviour (Armitage & Conner, 2001).

The TPB has been applied successfully to a range of different behavioural intentions in the health domain (see Conner & Sparks, 2005; Marcil, Bergeron & Audet, 2001, for example). The model has also been applied extensively to pro-environmental behavioural intentions in a domestic setting (e.g., travel mode choice, Bamberg, Ajzen & Schmidt, 2003; recycling, Chan & Bishop, 2013; water conservation, Trumbo & O'Keefe, 2005; Lam, 2006; Clark & Finley, 2007; consumer preferences, Bamberg, 2002; and environmental activism, Fielding, McDonald & Louis, 2008; Read, Brown, Thorsteinsson, Morgan & Price, 2013) and in the workplace (Blok, Wesselink, Studynka & Kemp, 2014; Greaves et al, 2013; Fielding, Terry, Masser, Bordia & Hogg, 2005; Laudenslager, Holt & Lofgren, 2004) though, until recently, fewer studies had been conducted in workplace settings. As discussed later, workplaces might pose different challenges for pro-environmental behaviour compared with those encountered in a home context. Overall, the validity of TPB as a model of behaviour intention has been supported (see Ogden, 2014; Abraham, 2014).

However, the TPB has received several criticisms in relation to its overemphasis on intentional factors such as cognitions and rational choice (see Manstead, 2000) to the detriment of the influence of affect, morals, self-identity, and unconscious processes (Sheeran, Gollwitzer & Bargh, 2013). Indeed, affect might well be more important for pro-environmental behaviours such as recycling, where there is greater intrinsic effort and no extrinsic reward. Researchers have argued that there must be an intrinsic motivational source that is driving the behaviour according to personal conscience (Thøgerson, 1996; Schwartz, 1977; Smallbone, 2005). Alternatively, the behaviour might be characterised by habit.

The weakened validity of the TPB in relation to pro-environmental behaviours has led to several extensions and the inclusion of an affective/moral dimension to help to explain public transport use (Bamberg, Hunecke & Blöbaum, 2007; Harland, Stats & Wilke, 2007) and recycling (Chen & Tung, 2010). There has been a general debate regarding the position of moral norms in the model (Kaiser, 2006; Chen & Tung, 2010), and in a comparison of the three possible positions, Chan and Bishop (2013) found that moral norms and attitudes are not

distinct concepts but share a large degree of variance. This finding suggests that TPB beliefs are not just about the facts of the matter but also include a moral element too.

The strongest criticisms leveraged at the original TPB model, and perhaps why many model extensions have been made, have been its limited predictive validity of behaviour rather than behavioural intention, and its usability to implement behaviour change (see Sniehotta et al, 2013; Hardeman, Johnston, Johnston, Bonetti, Wareham & Kinmonth, 2002; Webb, Joseph, Yardley & Michie, 2010). I would argue that the latter criticism is a universal problem with many models of behaviour: it is not unique to the TPB. With regards to the former criticism, Armitage and Conner (2001) found the predictive value of the TPB is substantially weaker for behaviour compared with behavioural intention. In a meta-analytic review, they found a 12% difference, from 27% to 39%, in explained variance between behaviour and behavioural intention. This suggests that people don't always do what they intend to do. There is considerable evidence to suggest that habit strength is often a stronger predictor than TPB measures (Gardner, De Bruijn & Lally, 2011).

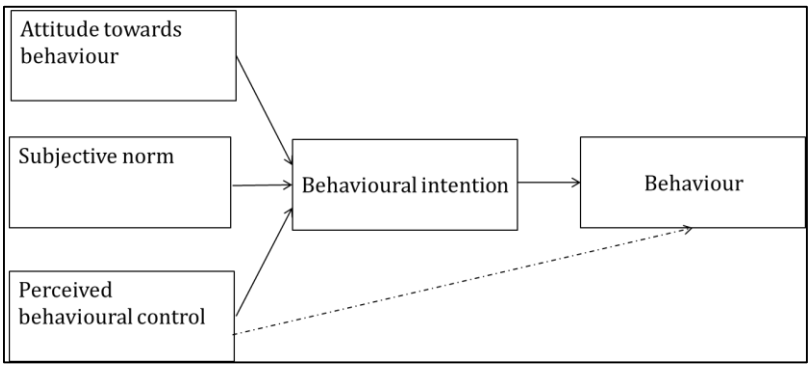


Figure 1.3. The Theory of Planned Behaviour (TPB; Ajzen, 1991)

1.3.3.4 The Health Belief Model

The Health Belief Model (HBM; Hochbaum, 1958; Sharma & Romas, 2012) places a greater emphasis on the role of cognition and conceptual awareness in determining behaviour (see Figure 1.4). The model proposes that behaviour is determined by the weighing up of the strength of threat to personal wellbeing and the perceived effectiveness of behaviour to counteract this. The perceived threat acts as a cue to action and is underpinned by the degree of susceptibility and seriousness perceived by the individual. There are two types of cue to action: internal indicators, those that pertain to the individual or their lifestyle; and external

indicators, those present from other sources such as Government or the media. The benefits and barriers that an individual associates with taking action determine the effectiveness of the behavioural response. In other words, an individual's thoughts, as well as their beliefs about their capability to respond effectively, will affect their ability to act.

Research across different behavioural domains has shown that the HBM has generally weak predictive power and it can explain at maximum 10% of behavioural variance (Harrison, Burgess & Filius, 1996). The relevance of the HBM to pro-environmental behaviour specifically is also, perhaps, less obvious than other models of behaviour. Consequently, there have been far fewer empirical studies conducted to explore its validity to pro-environmental behaviour. Those studies that have been conducted have tended to focus on waste disposal behaviours (see Lindsay & Stratham, 1997), perhaps because this action is more visually obvious and has an associated perceived threat from a local authority if waste is sorted incorrectly.

The personal relevance of the predictors in the HBM model might limit its validity to pro-environmental behaviour. The threats posed by climate change are often not perceived to be immediately or personally threatening, they don't always connect at a personal level. For example, according to figures from various sources (YouGov, Sept. 2013; Spence, et al 2010), around 5% of UK adults do not believe that climate change is a real phenomenon at all, with a further 20% or so believing that, while climate change is real, it is primarily caused by natural processes other than human activity. Consequently, the personal relevance of the threats posed by climate change may well be overlooked (either intentionally or unintentionally) and people might remain unaware of the problem and its scale (Page & Page, 2011; 2014a). They do not see either a pressing need or an opportunity to change. This being the case, individuals are unlikely to change their day-to-day behaviours to become more pro-environmental.

More generally, the HBM has also received criticism for not being well defined and for not including social, economic, or unconscious (habitual) determinants of behaviour (Jackson, 2005). A further limitation raised here specifically is the model's reliance on awareness. There is an underlying assumption that people have sufficient awareness of their behaviours and the environmental impact that these have. This, as discussed previously in relation to the influence of habits, opportunities and thoughts, is not always true. People might remain in a state of inertia because they are not sufficiently aware either of the potential threat or of the need to take action.

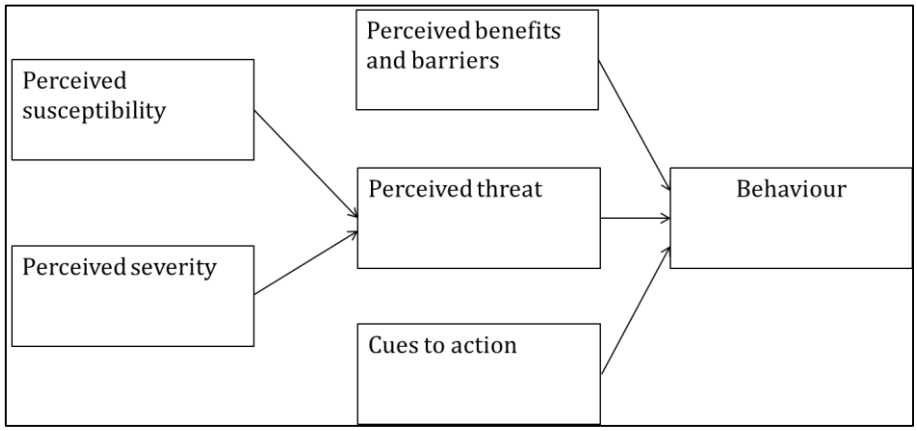


Figure 1.4. The Health Belief Model (HBM; adapted from Hochbaum, 1958)

1.3.3.5 Stages of Change (transtheoretical model)

The Stages of Change (SoC) model, which is also known as the transtheoretical approach (Prochaska & DiClemente, 1983; Prochaska, DiClimente & Norcross, 1992), is a stage model that seeks to understand people's susceptibility or resistance to changing behaviour. It has been used to guide interventions designed for and most widely applied to addictive health behaviours (e.g., smoking, see Prochaska & DiClemente, 1983) but it has also been applied to understand cycling behaviour (Gatersleben & Appleton, 2007) and car use reduction (Bamberg, 2013). The original SoC theory defines behaviour as being positioned at one of five stages that are temporally ordered and qualitatively different. The stages reflect an individual's "level of motivational readiness" and their willingness to change behaviour (Heimlich & Ardoin, 2008, p.279).

The five stages defined in the SoC model are: (1) pre-contemplation; (2) contemplation; (3) preparation; (4) action; and (5) maintenance (see Figure 1.5). At the stage of *pre-contemplation*, an individual is unaware of the problem and has no intention to change behaviour. At the stage of *contemplation*, an individual is aware of the problem and is seriously considering taking action to change. They are no longer 'blind' to the problem. At stage 3, *preparation*, an individual is ready to change and is intending to take action. At stage 4, an individual takes *action* to modify their behaviour or modifies the environment to leverage change. Once an individual has taken action, the biggest challenge is behaviour *maintenance*. This is defined as the last stage and it is here that an individual works to prevent relapse.

Different challenges are expected at each stage and are overcome by different types of interventions (Nisbet & Gick, 2008). These range from consciousness raising at the stage of pre-

contemplation through to substituting problem behaviours with alternatives (counter-conditioning) and stimulus control to avoid behavioural triggers during action and maintenance. Many of the change techniques align broadly with changing habits, thinking, and affect. It is suggested that movement (both forwards and backwards) between stages is driven by two factors: an individual's level of self-efficacy and their decisional balance (that is, the outcome of individual assessment of the pros and cons of behaviour; Armitage, Sheeran, Conner & Arden, 2004). However, it is clear that to initiate action, an individual must be sufficiently aware of the need to change.

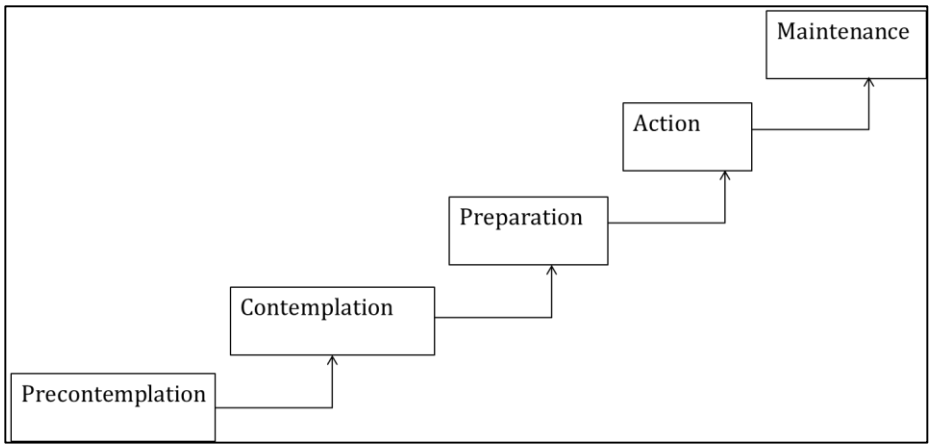


Figure 1.5. The Stages of Change model (SoC; Prochaska & DiClemente, 1983)

In its original form, the SoC model was developed to understand individual health behaviours. The underlying assumption, therefore, is that change efforts are intentional and personally beneficial to the individual. This is often not the case with pro-environmental behaviours and thus the model's validity might be more limited. In a recent adaptation, Bamberg (2011) outlined the Stage Model of Self-regulated Behaviour Change (SSBC) as a framework for systematic intervention development specifically for encouraging environmentally sustainable lifestyles. Bamberg's adaptation of the original SoC model was motivated by a need to account for the time-regulated and self-directed aspects of change that occur with pro-environmental behaviours. He suggested that these aspects have often been neglected in the models currently prevailing in environmental psychology (Bamberg, 2013).

1.3.3.6 The Stage Model of Self-Regulated Behaviour Change

The premise underlying the Stage Model of Self-regulated Behaviour Change (SSBC; Bamberg, 2013) is similar to the SoC model: behaviour change occurs through a series of qualitative

stages. In contrast to SoC, however, SSBC outlines four, rather than five, distinct stages (1. pre-decisional, 2. pre-actional, 3. actional, 4. post-actional), which are guided by Gollwitzer's model (1990) of action phases. They are connected by intentions that form a continuous path to the new behaviour.

At the *pre-decisional stage* individuals consider competing wishes and turn some of these into binding goals to form a *goal intention*. Upon development of a goal intention, an individual moves to the second stage (*pre-actional*) whereby a specific *behaviour intention* for guiding action is deliberated and decided upon. Formation of the behaviour intention moves an individual to the third stage (*actional*) and a narrowing down of behavioural options to a specific behaviour, which is formulated through an *implementation intention*. Commitment to an implementation intention takes the individual to the *post-actional* stage whereby the new behaviour is performed (Bamberg, 2011; 2013). Affective, social, and cognitive constructs underpin the formation of intentions at each stage (see Figure 1.6).

The SSCB model is more complex than many other models of behaviour and therefore, perhaps, assessment of its effectiveness is still in its infancy. A recent application in a social marketing campaign has shown promising results for encouraging car use reduction (Bamberg, 2013) but overall, more empirical analysis is needed to confirm its effectiveness. There also needs to be further refinement of the theoretical model to define the discreteness of each stage, the order of transition, and any flexibility relating to these aspects, as well as outlining the constructs that underpin each stage and how they might change following relapse. Bamberg's (2011; 2013) SSBC model for pro-environmental behaviour appears promising but warrants further empirical work.

In comparison to the TPB and HBM, stage models are more sensitive of the differences between people. As Bamberg suggests, they are more considerate of the "time-related and self-regulatory aspects of behavioural change" that have often been neglected in other approaches (2013, p.68). They also acknowledge that people might be unaware of the target problem and the impact that their behaviours have on this. The SSCB model challenges this by getting people to commit to a goal intention. This might help to target directly those established habits that make people unaware of their behaviours. This is a significant advantage over the other models of behaviour that have been described so far. The SSBC model also acknowledges explicitly the importance of self-efficacy for supporting people to move through the different stages.

As with the criticisms raised against the TPB, some researchers have suggested that stage models might be too egoistical in their approach, in as much as the models miss or underplay

the influence of structural economic, environmental, and social factors that could also influence performance of pro-environmental behaviours and attempts to change (see Morris et al, 2012). These are likely to support established patterns of behaviour and therefore might, to a certain extent, account for the gap between value and action that is often present in change attempts.

Following on, therefore, the next section of this review focuses on the models of behaviour and frameworks for behaviour change that place greater emphasis on extrinsic factors. These consider how environmental characteristics support behaviour.

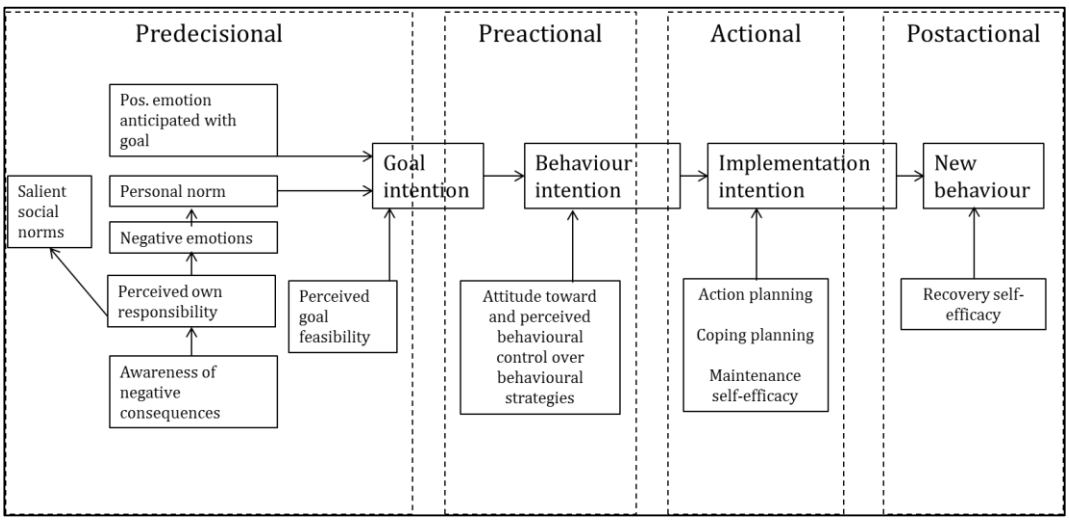


Figure 1.6. The Stage Model of Self-regulated Behaviour Change (SSBC; Bamberg, 2013)

1.3.4 Social and Technological Theories of Behaviour and Behaviour Change

This section of the review summarises the theories of behaviour and behaviour change that have emphasised the influence of extrinsic factors such as the physical and social context, lifestyle practices, and technology. There are fewer of these models overall and most of them have tended to originate outside of environmental psychology, in the domains of sociology and innovation. However, as daily behaviours (including pro-environmental actions) can often be seen as habits supported by the external context, it seems appropriate to review them here. This review summarises the two theories that appear most relevant for pro-environmental behaviours, the Social Practice Theory (SPT; Giddens, 1984), and the Diffusion of Innovation Theory (DOI; Rogers, 2003).

1.3.4.1 Social Practice Theory

In contrast to the individualistic models of behaviour and behaviour change presented so far in this review, the Social Practice Theory (SPT; Giddens, 1984; Bourdieu, 1977, 1990; Shove, 2010; Hargreaves, 2011) considers how behaviours are embedded in the structures of everyday life, in the routine performances of social practices such as cooking, driving, washing, and shopping (Warde, 2005). People often perform these behaviours routinely and perceive them to be "normal ways of life" (Shove, 2004, p.117). Through the exposure to and repetition of social practices in day-to-day life, behavioural sets develop and become associated with different practices. Subsequently, behaviours are no longer determined by an individual's personal competencies and intentions (as suggested by the NAM, VBN, TPB, HBM theories), but individuals become, instead, 'carriers' of social practices and thus are 'performers' of the behaviours that are required by the practice (Reckwitz, 2002). In essence, people develop behavioural habits and routines that are congruent with their environmental circumstances (see Figure 1.7).

The on-going debate about the definition of a practice is beyond the scope of this review. However, to illustrate, Shove and Pantzar's (2005) conceptualisation is used here, as this has been applied to pro-environmental behaviour change (Hargreaves, 2011). Accordingly, a practice is a combination of images (meanings, symbols), skills (forms of competence, procedures) and stuff (materials, technology) that are "dynamically integrated" (Hargreaves, 2011, p.83) by people through repeat performance. Throughout life individuals will experience many different social practices, some of which will be durable whilst others will be much more transient. People integrate these factors and develop behaviours that reflect them.

With increasing exposure to social practices, individuals learn and develop a better understanding of the world around them until they become agents skilled in performing a wide range of practices in everyday life (Warde, 2005). Therefore, to initiate the behaviour change that is required for environmentally sustainable lifestyles, it is suggested that change should be targeted at transforming practices to make them more sustainable rather than targeting individual characteristics *per se* (Southerton, Warde & Hand, 2004). This involves challenging and breaking the links and elements of unsustainable practices and replacing these with more sustainable ways. This can be implemented by two means, from inside out as individuals intentionally break existing conventions with new ways of doing things, and also from the outside in, through structural change as different practices come into contact with each other

(Warde, 2005). Both are effective methods for encouraging pro-environmental behaviours in the workplace (Hargreaves, 2011).

Social Practice Theory has also been used to understand environmentally sustainable behaviours such as energy use, transport, and waste disposal behaviours, as well as being acknowledged in its correspondence with policies (Chatterton, 2011). The consistent structure that social practices offer can be advantageous once pro-environmental behaviours are established. The relatively stable routinisation of daily life enables people to develop pro-environmental habits such as cycling to work, turning lights off and dutifully recycling, somewhat automatically, without over exertion of conscious decision-making processes (see Dahlstrand & Biel, 1997). However, these same characteristics might be a particular challenge when seeking to change established behaviours to be more pro-environmental. As previously discussed, this might be because people have a lower level of awareness of their actions and the opportunities available for change, and this might be a key barrier to initiating a different course of action. Established habits/practices might inadvertently make people more resistant to change (Danner et al, 2007).

Transport choice is perhaps the best researched of the areas in which automatic action is cited as a negative environmental factor; specifically, the near automatic favouring of the private car over public-transport alternatives is frequently attributed to the force of habit (e.g., Dahlstrand & Biel, 1997; Davidov, 2007; Klöckner & Matthies, 2004; Verplanken et al, 1997; Verplanken et al, 2008). It is also possible that the unnecessary turning on (and leaving on) of lights or of heating systems, the disposal (rather than recycling) of waste, or the unnecessary use of water, could all be under the influence of habits, rather than being driven by more rational considerations as proposed in the NAT (Schwartz, 1977), the VBN (Stern, 2000), and the TPB (Ajzen, 1991). The environmental problems with which we are currently faced suggest that these environmentally deleterious habits pervade. It is suggested, therefore, that models of pro-environmental behaviour need to consider further the influence of habit and how this might prevent pro-environmental behaviour change.

So far this review has identified the importance of awareness, self-efficacy, and habit. It has also suggested that both individuals and researchers might be prone to habitual action, and that this might suppress their abilities to engage effectively with the problems that climate change presents. Up to now the attention on habit has been focused mainly on behaviour: the review has considered how behavioural habits might support or impede pro-environmental activity in day-to-day life and also how habits might suppress awareness and separate action from beliefs

and intentions. The next model presented in this review offers a means by which existing habits might be challenged so as to encourage behaviour change.

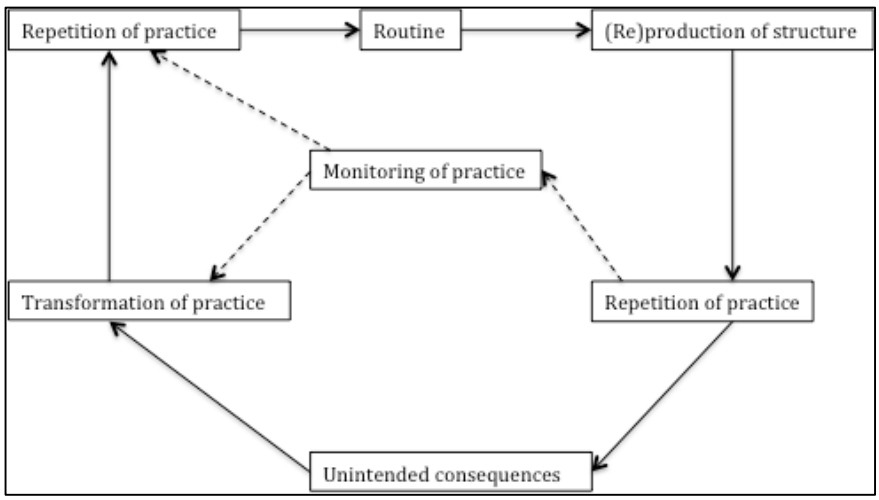


Figure 1.7. The Social Practice Theory (SPT; Giddens, 1984)

1.3.4.2 Diffusion of Innovation Theory

The Diffusion of Innovation theory (DOI; Rogers, 2003, see Figure 1.8) is a model of change that suggests that new behaviours will be adopted through a process of innovation, which is defined as "an idea, practice or object perceived as new" (Rogers, 2003, p.12). Accordingly, the innovation (or an awareness of this), as opposed to the individual, is the agent of change, which occurs when the innovation has relative advantage and is perceived as being better than the existing option, has compatibility with the existing values, experiences, and needs of the adopters, is not too complex, can be tested, and has observable results. In other words, it is perceived as a suitable and more desirable alternative to current behaviour. The key component here is an individual's awareness of the novelty and preferability of the innovation.

According to the DOI, behaviour change occurs through a process of five stages; these are defined as knowledge, persuasion, decision, implementation, and confirmation. Efforts to change behaviour can be influenced by the type of innovation, the efficiency of communication channels, time, and the extent and integration of social systems. Effectively communicating the innovation, through mass media and social networks, and the adoption of it by early adopters, are critical to instil change in others. Put another way, adoption of an innovation by some people can help to raise other people's awareness of the opportunities that are available.

Individuals can differ in their adoption of new behaviours, and in a population there will typically be a normal distribution of innovators, early adopters, early majority, late majority, and laggards. The people within each group are qualitatively distinct and will likely require a different motivation to change behaviour. An individual's categorisation might depend on the degree to which their existing behaviours are characterised by habit. DEFRA's framework on sustainable lifestyles identifies seven behavioural groups that are similar to those described by the DOI theory. These range from 'positive greens', the group which represents individuals who have high potential and a willingness to act, through to individuals who are 'honestly disengaged' and have low potential and are unwilling to change their behaviour (Russell, 2011). It is unlikely that those individuals who are disengaged will be susceptible any time soon to pro-environmental psychological interventions. For those individuals who are engaged, Roger (2003) suggests that the degree of commonality in the social network can influence the degree to which innovation is diffused and subsequently adopted. Homogenous social networks are likely to have more effective communication channels and thus tending better to support innovation.

Pro-environmental behaviours can themselves be classified as innovative or social innovations (Fell, Austin, Kivinen & Wilkins, 2009), especially with regards to the adoption of new technologies. Taking the realm of green electricity adoption as an example, there are several factors that have been identified as barriers to adoption for people with a 'greener' disposition (Ozaki, 2011). Such barriers include the personal relevance of climate change, the absence of strong social norms to diffuse the adoption of innovation, the perceived inconvenience of undertaking a new behaviour (e.g., switching to a green tariff), and perceptions of uncertainty about the quality of the innovation (green electricity). Similarly, in terms of the diffusion process itself, ambiguity about the cost and benefits of adoption, the need for a critical mass of adopters, and the support from catalytic individuals are all equally important (Fell et al, 2009).

In summary, it appears that the DOI model offers a clear theoretical pathway to behaviour change that works by presenting a novel perspective (innovation) that challenges the context within which existing habits reside, and therefore brings behaviour under more volitional control. The key ingredients for instilling change, through raised awareness, are the strength of the influence of messaging through social networks and mass media. Overall, the DOI theory might be a more useful approach for getting people to think about new behaviours and preparing them to take action rather than for instilling change itself.

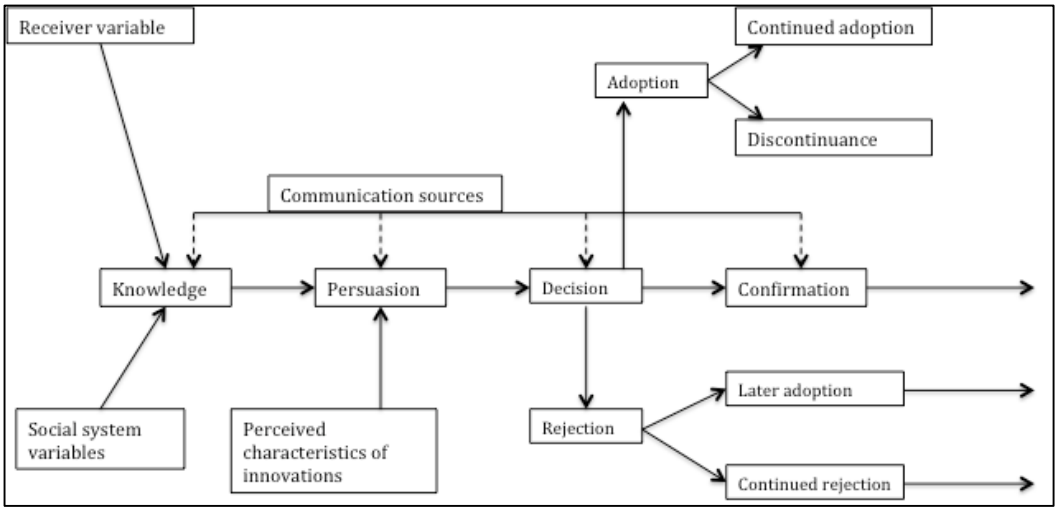


Figure 1.8. Diffusion of Innovation Theory (DOI; Rogers, 2003)

1.3.5 Multi-disciplinary Approaches of Behaviour and Behaviour Change

The final section of this review focuses on the models of behaviour and behaviour change that are multi-disciplinary. In contrast to the models described previously, multi-disciplinary approaches tend to be more eclectic and define behaviour from many different theoretical positions. Consequently, they tend to be more complex but often do offer a more practically oriented approach to change behaviour.

The diversity that is offered by multi-disciplinary approaches is seen here as a good thing. As discussed previously, it is important that the researchers who seek to develop a better understanding of pro-environmental behaviour (myself included) broaden their own attentional set and pay more active attention to different perspectives, rather than developing more specialised silos (see also Ogden, 2014). So far this review has suggested that a large majority of the theoretical and empirical research on pro-environmental behaviour has become rather fixed on investigating a limited range of established variables, perhaps to the detriment of alternative approaches. If future research continues in this way, researchers are even more likely to be inattentive to novel approaches of behaviour change. With this in mind, the next section of this review presents some alternative approaches to pro-environmental behaviour change that are more practically oriented though, so far, less well empirically explored. In other words, they have, at first sight, greater practical usability but less demonstrated validity.

1.3.5.1 The "4 E's" Model

The "4 E's" model of behaviour (HM Government, 2005) is focused on four elements that facilitate change. These are described as: *engage; enable; encourage; and exemplify* (see Figure

1.9). Accordingly, the starting point for change is to first *engage* people and then to *enable* them to take action by removing existing barriers that might prevent action directly or indirectly. This is done through providing individuals with the education, skills, and information that they need to make sustainable choices in correspondence with the provision of a suitable infrastructure, if needed. *Engaging* involves raising individuals' awareness so that they are sufficiently aware of the opportunities that are available to them. In so doing, this approach might help people to feel more empowered and capable of change, an enhancement of self-efficacy (Bandura, 1994).

The next step is about *enabling* individuals to change behaviour by modifying the 'structure' within which behaviours occur. This might happen by changes to local social, political, and financial systems or through enforcement, if necessary. Once the 'structural' changes have been made, the next step is to *encourage* individuals to act. It is proposed that they can be encouraged by social and informational campaigns. Lastly, the model suggests that environmental sustainability needs to be *exemplified* from the top and governments need to lead by example and embed environmental sustainability into their own decision-making, operations, and behaviour.

It is clear to see that the "4 E's" model takes a multi-disciplinary approach and that it draws on other models of behaviour and behaviour change (e.g., NAT; VBN; TPB; HBM). It acknowledges how these perspectives are important for getting people to *engage* with potential behaviour change and to *encourage* action. The model also considers extrinsic variables and acknowledges the importance of creating the right environmental conditions to *enable* pro-environmental behaviour. In so doing, it draws on the influence of the second class of theories that have been reviewed, those that emphasise the role of the social and physical context (e.g., SPT; DOI).

In addition to the "4 E's" outlined in the framework, it also seems sensible to add two additional "E's" to top and tail the existing model (see Maskell & Page, 2015). The first of these – *explore* – is the starting point for individuals (and organisations) to reflect on current behaviours (and practices), the impact that these have, and to consider the alternative behaviour options that are available. This might help to raise an individual's awareness towards climate change in general and more specifically, their own personal impact. A method of *evaluation* is an appropriate "E" to add to the end of the model. This might encourage individuals to reflect and consider whether their change efforts were successful and have had the desired effect.

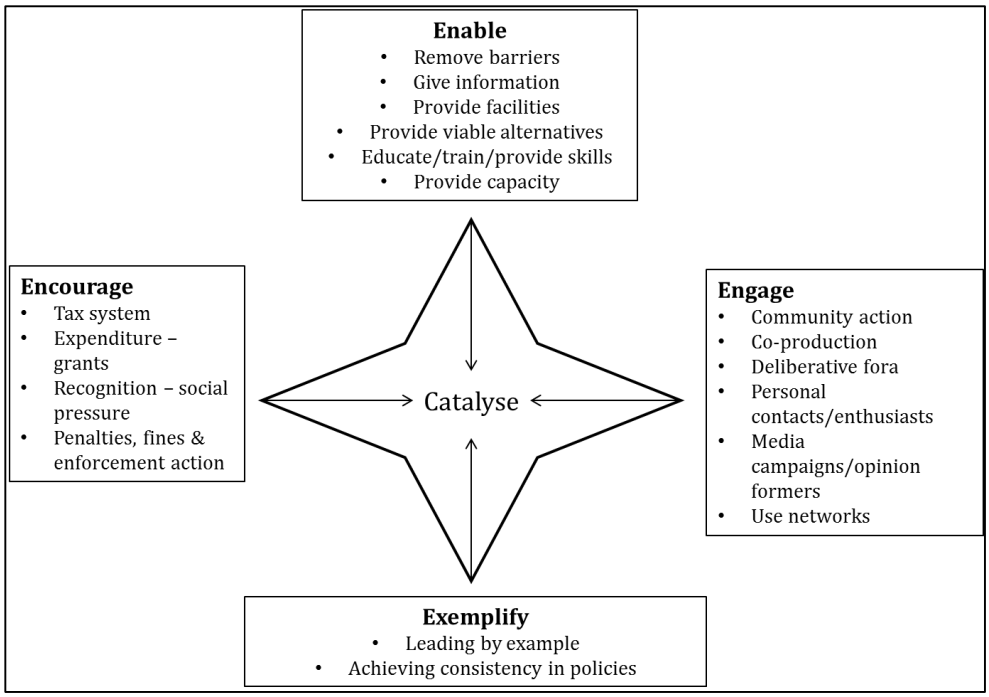


Figure 1.9. The "4 E's" model (HM Government, 2005)

1.3.5.2 The Energy Cultures Framework

The second multi-disciplinary approach considered here is the Energy Cultures framework (Stephenson et al, 2010). This is a multi-disciplinary model of behaviour that aims to understand the factors that underpin energy consumption specifically. It explains energy consumption through a culture-based model that is defined by three core concepts: *cognitive norms* – an individual's beliefs and understandings about energy; *material culture* – technology and infrastructure that determine behaviour; and *energy practices* – activities and behavioural tendencies (i.e., routines or habits). As well as each component having a direct effect on behaviour, they are also specified to be highly interactive. The overall model can be conceived as a macro interactive system, as well as each core concept being understood as a micro interactive system (see Figure 1.10).

The Energy Cultures framework combines both the egoistic variables that are centred on the individual as well as the social and technological constructs that are more widely dispersed. This gives it a validity advantage over most of the other models discussed in this review. It also presents a flexible framework that identifies the variables that could influence behaviour but it does not prescribe how these should be characterised or measured. As such, it offers a multi-disciplinary approach that is less deterministic but more change-oriented, although there are no clear volitional strategies for implementing change. Through identifying clusters of 'energy

cultures' it is possible to target behaviour change in places where there are similarities in norms, practices, and material culture. In this way a tailoring approach is possible.

To summarise and relate to Wilson and Dowlatabadi's (2007) three requirements for a successful integrating model, the Energy Cultures framework (Stephenson et al, 2010) accounts for *context*, works at different *scales* and can account for *heterogeneity*. It has sufficient flexibility to be suitable and effective in changing a range of different pro-environmental behaviours, for different individuals, and in different contexts. In this regard, it could be argued that its theoretical complexity makes it too ambiguous for practical application. It lacks the usability of other frameworks.

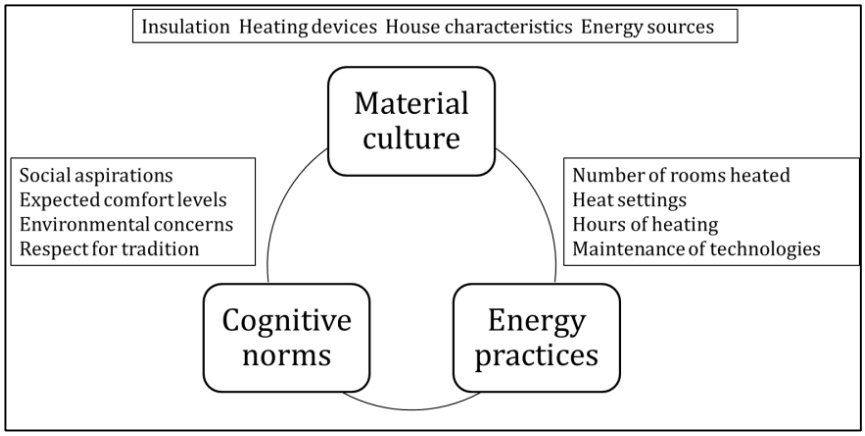


Figure 1.10. The energy cultures framework (Stephenson et al, 2010)

1.3.5.3 The Comprehensive Action Determination Model

The Comprehensive Action Determination Model (CADM) developed by Klöckner and Blöbaum (2010) is presented in this review as, perhaps, the most complete model of behaviour. This model was developed in response to the limitations of existing models of behaviour, some of which have been raised here. To counteract some of the criticisms levelled at previous models, CADM was designed as a more inclusive framework with more applicability to different behavioural situations (Matthies, 2003). The integration of all influential variables is beneficial for the design of intervention strategies but can make the model too complex for successful implementation.

The CADM draws directly on the TPB (Ajzen, 1991), the NAM (Schwartz, 1977), and considers both the influence of habit (a variable that has been overlooked by many preceding theories), and situational influences. The model suggests that behaviour is directly influenced by three

possible sources: conscious processes such as intentions and attitudes; situational processes including both objective and subjective constraints; and habitual processes including schemas, heuristics and associations. The influence of normative processes (such as social norms, personal norms, the awareness of need, and the awareness of consequences) is also included, but these, in contrast to the NAM (Schwartz, 1977), are described to have an indirect effect on behaviour that is mediated by habitual and intentional processes.

The CADM specifies a complex interaction amongst the variables (see Figure 1.11). It is proposed that normative processes can influence both intentional and habitual processes. According to Klöckner and Blöbaum (2010), personal norms are embedded deep in an individual's value system and remain relatively stable over time. If they are activated by a situation then they tend to have a direct effect on intentions and behaviour. This results in congruence between personal norms and behaviours. However, at times, situational and habitual factors might interfere with the process and moderate the impact of intentions on behaviour (Ajzen & Fishbein, 2005). One potential disruptor is a lack of actual or perceived behaviour control, also called self-efficacy (Bandura, 1994). When behaviour is not perceived as being under volitional control, which is often the case when behaviours are characterised by habit, then personal norms and intentions will not be activated to guide intentions or behaviour (see Bargh & Chartrand, 1999; Triandis, 1977; Ouellette & Wood, 1998; Danner et al, 2008).

The CADM model has been applied to explain travel mode choice behaviour (Klöckner & Blöbaum, 2010), and has shown greater explained variance compared with less complex models of behaviour such as the TPB (Ajzen, 1991). In this empirical work, situational constrains, intentions, and habits were found to have the strongest influence on behaviour. Klöckner (2013) has also confirmed the model structure in a recent meta-analysis involving 56 independent data sets. Overall, the model appears to provide a valid account of pro-environmental behaviour but in terms of its usability, it lacks a sufficient offering of volitional strategies for implementing change.

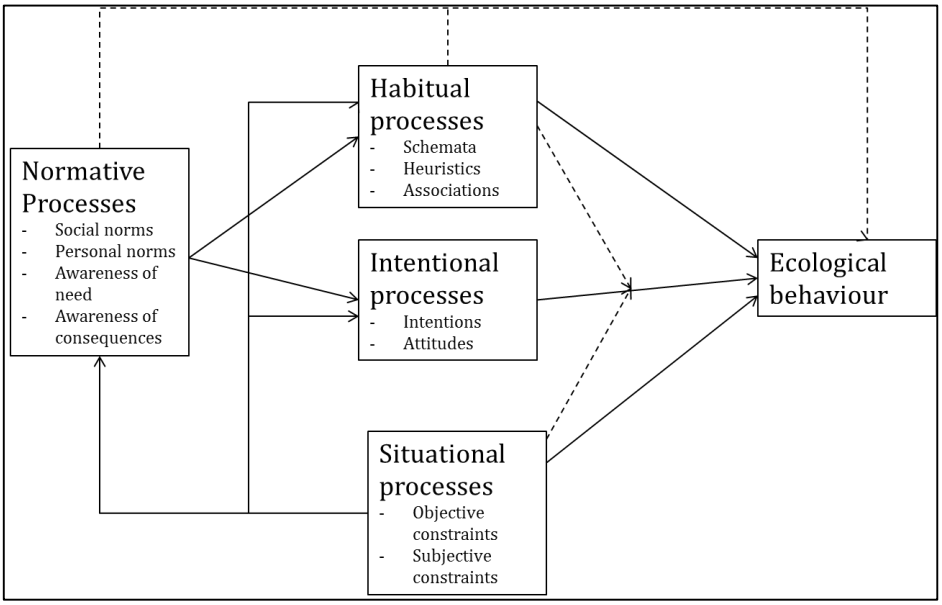


Figure 1.11. The Comprehensive Action Determination Model (CADM; Klöckner & Blöbaum, 2010)

In summary, the multi-disciplinary approaches summarised in this part of the review appear to offer greater practical application to pro-environmental behaviour change. By drawing on a range of different theoretical perspectives and including a larger range of variables, the multi-disciplinary models have gone some way towards overcoming some of the criticisms that have been levelled against other models. They might, however, be too complex to implement effectively especially without outlining sufficiently specific strategies for change.

1.4 Discussion

This review examined popular and historical models of behaviour and considered broadly their application and effectiveness to pro-environmental behaviours and behaviour change. In so doing, it has highlighted that there are many existing psychological theories and models of behaviour and behaviour change, some designed specifically for pro-environmental behaviours and others designed initially for different types of behaviour and applied latterly to this domain. Each approach has its own strengths, weaknesses, and appropriateness in relation to pro-environmental activity. Many of these factors were discussed throughout the review in relation to the influence of habits, opportunities, and thoughts. Although each perspective is relatively distinct, some crosscutting similarities are apparent, and can be used collectively to further our understanding of pro-environmental behaviours. It is hoped that these might help to improve the effectiveness of pro-environmental behaviour change interventions in the future.

The first theme relates to where the model places emphasis. Many models of behaviour and behaviour change are egoistic in the sense that they focus on individual or personal characteristics such as cognitions, values, and beliefs as determinants of behaviour and levers for behaviour change (e.g., TPB, HBM, SoC), often at the expense of social or contextual factors. In contrast, there are also other models that place greater emphasis on the social dynamics of behaviour and account for social systems and practices (e.g., SPT, DOI). These, however, tend to overlook or underestimate the role that individual characteristics and personal capabilities have in determining the social context and practices that then might influence behaviour. It is suggested that models of behaviour and interventions for behaviour change, and particularly those focused on pro-environmental activity, need to consider both the individual as a decision-maker and the wider social context in which the decisions are being made. The models that do consider both perspectives (e.g., Energy Cultures framework; Stephenson et al, 2010; CADM; Klöckner & Blöbaum, 2013) are more inclusive but they appear to lack a clear practical approach to behaviour change. In other words, there does seem to be a tension across models between a model's technical validity and its practical utility.

Two further points relate to this. First, any new model of behaviour needs to consider how, if at all, the theory can be applied in a practical way to help people change behaviour. For example, in relation to the TPB (Ajzen, 1991), researchers (see Sniehotta et al, 2013) have recently called for the retirement of the theory because of its lack of utility in helping people to change. This criticism, I believe, can be applied to many of the models presented: they lack a sufficient specification of volitional strategies for change. This makes them useful models for understanding the variables that determine behaviour rather than practical methods for behaviour change.

Second, it is suggested that when change interventions are offered, they need to empower people so that they feel confident and able to take action, regardless of the external social and physical factors that might challenge this. As mentioned previously, it is important to give consideration to an individual's personal belief that they are even capable of changing their behaviour – their self-efficacy (Bandura, 1994), as this will determine an individual's behavioural motivation. Without a sufficient level of self-efficacy, people might avoid attempting a specific behavioural change because they do not believe that they are capable of its successful implementation. For this reason, it is suggested here that a second key step in any intervention seeking to encourage pro-environmental behaviour change involves developing intrinsic beliefs relating to self-efficacy in conjunction with the development of personal

behavioural repertoires so that people feel confident, empowered, and able to take a different course of action.

It might not, however, be possible to enhance self-efficacy without taking greater consideration to why people might be resistant to change in the first place. Often this resistance is not intentional (see Reed & Page, 2010), but is linked to threats to self-identity (Murtagh, Gatersleben & Uzzell, 2012). It might also occur because of a network of habits in cognitions, affect, and behaviours. When established behaviours are characterised by habit, they are often "scripted" (Fujii & Garling, 2003) and happen automatically and unintentionally in response to environmental circumstances. Their automaticity means that people are often less cognitively alert to their behaviours, the environmental impact that these have, and the alternative opportunities and behaviours that are available. This blinkering might bias their thoughts so that they believe they have no choice or ability to change behaviour – it diminishes their self-efficacy and motivation to change (Bandura, 1994).

Most of the models presented in this review identified awareness as one of the key determinants of behaviour and driver of behaviour change, and made, to a certain extent, an assumption that individuals are actively aware. This, as discussed previously, is not always the case. It is, therefore, suggested that the models of pro-environmental behaviour and frameworks for behaviour change that are developed from now on need to address people's levels of awareness. This might involve both a significant change in their attentional set and a transfer of relevant knowledge. In the absence of a more attentive and informed stance, it is difficult to see how behaviour change options will get even a foothold, let alone be implemented successfully.

Returning to the influence of habit, most of the models have been developed from the perspective of bounded rationality, and assumed that the acquisition of new information about behaviour and/or its alternatives will lessen the intention-action gap. It could be suggested that researchers themselves are in a thinking trap (Fletcher & Pine, 2013), and have a tendency to overestimate the power of thinking and underestimate the power of actions. This cognitive overemphasis has resulted in the development of many intervention techniques that seek to change cognitions and beliefs as a lever to change behaviour. However, changes to beliefs and cognitions do not always translate to behaviour change. Similarly, even strong behavioural intentions do not always result in planned behaviours (Armitage & Conner, 2001). It seems that there is a need to approach behaviour change from a different perspective, perhaps in a way

that takes a broader and more practically oriented approach. This might encourage people to act out new behaviours rather than getting them to think about performing these.

This review has highlighted that a large majority of the theoretical models of pro-environmental behaviour are of a similar type. It has been reiterated throughout the review that more empirical research needs to be directed towards the development of novel approaches. With consideration to these points, this programme of research introduces and explores empirically a relatively novel framework of behaviour change called the FIT Framework (Fletcher & Stead, 2000). It is suggested that although FIT is more novel and less empirically validated, its eclecticism might help to challenge the thinking habits of researchers.

2 The Theoretical Relationship between the FIT Framework and Environmental Sustainability

2.1 Introduction

Following on from the review presented in Chapter 1, this chapter describes the FIT Framework (Fletcher & Stead, 2000) in detail and explores the potential relationship between FIT variables and pro-environmental behaviour. There have been some practical applications of the FIT Framework to a range of psychological and social outcomes including stress, weight loss, and family functioning (Fletcher & Stead, 2000; Fletcher, Hanson, Page & Pine, 2011; Sharma, 2011). This programme of research presents the first conceptual and empirical application of FIT to the domain of environmental sustainability. It seeks to elucidate the value of the FIT Framework in relation to pro-environmental activity, to encourage and support individuals to develop more environmentally sustainable lifestyles.

2.2 The FIT Framework

The FIT Framework (Fletcher & Stead, 2000) is a potentially interesting model of behaviour that is explicitly accompanied by an associated framework of behaviour change. By way of contrast with the models of behaviour described in Chapter 1, FIT is a model that considers the potential impact of cognitive and behavioural habits on pro-environmental behaviour and behaviour-change efforts, by explicitly measuring Behavioural Flexibility. The FIT Framework has not been tried and tested directly in relation to pro-environmental activity, in the way that many of the preceding approaches have been; it is very much a work in progress. The purpose of this programme of research is to undertake the first empirical evaluation of FIT in relation to pro-environmental activity.

The FIT Framework comprises a collection of psychometrically validated tools (principally, the FIT Profiler; Fletcher, 1999) and a variety of behavioural interventions (principally, a Do Something Different programme). At its inception FIT was proposed as a framework for understanding personal effectiveness in decision-making and behaviour. It was offered as a theoretical framework for understanding the differences between people in how they cope with the situations they encounter (Fletcher & Stead, 2000). In line with this, much of the early research on FIT was focused on personal strain levels (e.g., see Fletcher, 1991).

FIT is formulated around a framework of cognitive and behavioural competencies that, it is suggested, guide an individual's perceptions of different situations and the demands that

associate with these. In particular, the framework focuses on five cognitive competencies; also named the Constancies, and the degree of flexibility across fifteen behavioural dimensions, termed Behavioural Flexibility. These dimensions are perceived to influence an individual's decision-making processes and their execution of behavioural choices.

FIT theory acknowledges that both behaviour and thinking-style can be prone to inflexibility and habit. Unlike other models of personality and of behaviour, FIT emphasises the idea that for maximum effectiveness one would not want to be located at any given point along a particular behavioural dimension. Instead, it is suggested that individuals should be comfortable operating at widely dispersed points along the dimension, so as to display the flexibility that is required to cope effectively and efficiently in different circumstances. To give an example, using the dimension of Introversion-Extroversion, FIT emphasises that rather than seeking to locate one's "character" at a particular point along this dimension, the varying demands of the real world would recommend behavioural flexibility, that is, sometimes being introverted, sometimes extroverted, as the occasion requires. The enhancement of such flexibility is intended, therefore, to counteract habitual, unaware behaviour.

2.2.1 FIT Integrity and the Cognitive Constancies

Fletcher and Stead (2000) describe the cognitive Constancies as underpinning action. Furthermore, they suggest that if the Constancies are strong, they are more likely to guide decision-making and behaviour that is effective and accords with current circumstance and personalised goals, rather than simply being driven by force of habit. Like Behavioural Flexibility, the cognitive Constancies are described as trainable. They can be strengthened and developed. There are five Constancies in the FIT framework and it is plausible that each might have a role to play in determining pro-environmental behaviour and driving efforts towards pro-environmental behaviour change. This programme of research explores this possibility.

FIT Integrity is at the foundation or core of an individual and of FIT theory. According to Fletcher and Stead (2000), it is seen to provide a solid base for guiding decision-making and behaviour. It helps to ensure that actions are appropriate and are performed with consideration to current circumstance, and that they accord with personal and internalised goals. FIT Integrity can be conceived as an individual's level of cognitive flexibility. FIT Integrity is a composite measure of the five cognitive Constancies referred to below, which are the "behavioural and psychological templates" that individuals use for guiding decision-making and behaviour (Fletcher & Stead, 2000, p.16). The Constancies are Awareness, Balance,

Conscience, Fearlessness, and Self-responsibility. They are seen as personal characteristics or resources that are trainable and can be developed, and each will be described in turn.

2.2.1.1 Awareness

According to the FIT Framework, Awareness is the degree to which an individual monitors and attends to their internal and external worlds. Awareness can be thought of as an antidote to being a habit-machine, as it refers to being awake and monitoring internal and external states and using feedback to guide action, thoughts, and feelings. Fletcher and Stead (2000) suggest that Awareness relates to the extent that individuals are awake to their environments and the learning possibilities that these offer for personal development and improvement. According to the FIT Framework, Awareness is seen as an essential competence to support individuals to develop and change proactively. It is seen as the 'engine' for driving change as well as the on-going monitor of opportunity.

Developing and maintaining a high level of Awareness can be effortful and idealistic for many individuals because, as Wood and Neal (2007) suggest, many people are on automatic pilot and are bound by their habits most of the time. Consequently, the feedback that results from past experiences is overlooked and not considered when planning future actions. As discussed previously (Page & Page, 2011; 2014a), people are often unaware or have a lower level of awareness than is optimal. This low level of Awareness might prevent people from making full use of their personal resources, their behavioural options, and the opportunities that they have for changing deliberately for the better. In contrast, Fletcher and Stead (2000) suggest that having a high level of Awareness can be considered an antidote to being a habit-machine; it is about being awake and monitoring internal and external states and using feedback to guide actions, thoughts, feelings, and decisions.

Awareness might influence the environmental sustainability of people's lifestyles in several ways. In relation to pro-environmental behaviour and change, it is suggested that individuals who have a higher level of Awareness might also be more aware of issues relating to climate change, the degree of environmental sustainability in their personal lifestyle, the impact of their current behaviours, and the possibilities of change to become more pro-environmental. In line with this reasoning, it is predicted that personal levels of Awareness will relate to environmental sustainability such that individuals with higher levels of Awareness will be more pro-environmental in their approach.

2.2.1.2 Balance

The Balance Constancy is described as an individual's ability to ensure every aspect of their life receives due care and attention so that each part, be it work, non-work or self, are "in sync" and that no one dominates. Accordingly, a person who scores high on Balance is able to prioritise different aspects of their life and allocate cognitive and behavioural resources towards these in accordance with demand. In contrast, a low Balance score suggests there is an imbalance between the different dimensions and possibly reflects the fact that an individual is too absorbed in one aspect of their life, usually to the detriment of other aspects. An individual's level of Balance reflects their ability to manage different aspects of their life effectively. Fletcher and Stead (2000) suggest that an individual who has a high level of Balance will receive proportionately sufficient satisfaction from each aspect in return.

In relation to environmental sustainability, a person with a low level of Balance might compromise this aspect of their lifestyle, potentially resulting in aspects of pro-environmental activity being pushed aside and excluded in the cognitions or behaviours of daily life. This might be because other habits get a stronger foothold and dominate day-to-day routines. In contrast, individuals with higher levels of Balance might consider issues relating to environmental sustainability as an equal priority alongside other demands, with the consequence that pro-environmental behaviours are more prominent in their daily life. It is, therefore, predicted that individuals with higher levels of FIT will have greater Balance across different aspects of their life, and that pro-environmental behaviours will be more prominent and embedded more effectively into lifestyles.

2.2.1.3 Conscience

The third Constancy is Conscience. This is described as the moral compass for decision-making and behaviour. Conscience allows people to differentiate right from wrong and then act on doing the right thing. It follows that an individual with a high level of Conscience will endeavour to make every decision an ethically and morally correct one; they will never compromise morals in order to achieve an external goal. Although each individual will have different but personally relevant ethical and moral guidelines, Fletcher and Stead (2000) suggest that, as standard, they are likely to be guided by at least some of the following factors: an appreciation of the rights of others; respect of others' thoughts, desires and actions as well as their physical, intellectual and emotional competencies; an unprejudiced view of others; and a respectful view of oneself. By plausible extension, individuals with higher levels of Conscience might feel more

connected with issues of environmental sustainability and therefore be more engaged, both cognitively and behaviourally, with pro-environmental activity.

2.2.1.4 Fearlessness

The fourth Constancy identified in the FIT Framework is Fearlessness. This is described as acting without fear or trepidation and facing unknown situations with the same confidence and bravado as those that are known. Negative emotions such as fear and anxiety have been identified as barriers to action in several models, particularly those describing health behaviours. When fear is particularly high it can restrict many aspects of daily life and can skew rational thought and prevent intended action. Excessive levels of fear can cause phobias. Emotions, including fear, can often be the main driver of behaviour and the decisions people make. The FIT Framework conceives fear as the emotional limiter of behaviour that keeps people within their comfort zones, doing the things they have always done. It acknowledges that the influence of fear on people's actions, choices and decisions might be unconscious, or, if felt, be too powerful to overcome. As a consequence, the FIT Framework suggests that this causes people to stick to 'safe' patterns of behaviour. In essence, high levels of fear can strengthen the network of cognitive, affective, and behaviour habits and make people more resistant to change.

In contrast, Fearlessness is achieved when people, to a significant degree, disconnect emotion from decision-making. Fearlessness supports individuals to act outside of their behavioural comfort zone, in accordance with their personal wants, desires and intentions. Individuals with higher levels of FIT typically have higher Fearlessness scores, as measured by the FIT Profiler.

A sufficient level of Fearlessness might be necessary to encourage people to embed pro-environmental activities into their lifestyles, particularly if there are external barriers such as social norms that run counter to an individual's desired actions. Higher levels of Fearlessness might give people the confidence to experiment with new and different ways of behaving, without the fear of failure. Thus, individuals with higher levels of Fearlessness are also predicted to have more environmentally sustainable lifestyles.

2.2.1.5 Self-responsibility

The FIT Framework describes the Self-responsibility Constancy as the barometer for the extent to which an individual takes charge of their life and accepts responsibility for their actions and the things that happen to them, regardless of factors outside of their control. As Fletcher and Stead (2000, p.22) put it, Self-responsibility is the "motivator, self-limiter and mission-setter"

of the Constancies. It is suggested that an individual who is Self-responsible will shape his or her own world intentionally rather than relying on past habits. They will not believe in luck and chance, nor will they blame external factors for the things that happen to them. Accordingly, an individual who is Self-responsible takes an active role in shaping their world so that it suits them.

In relation to environmental sustainability, it might be that an individual's level of Self-responsibility will influence their felt level of personal responsibility to do something to reduce their environmental impact. Having a high level of Self-responsibility might strengthen the level of personal responsibility that an individual feels towards climate change and their personal contributions to it. This, in turn, might help to initiate pro-environmental action. Fletcher and Stead (2000) suggest that individuals with higher levels of FIT have higher levels of Self-responsibility. Following this reasoning, it is predicted that there will be a positive relationship between Self-responsibility and environmental sustainability meaning that those individuals with higher levels of Self-responsibility will more pro-environmental in their approach.

2.2.2 FIT Behavioural Flexibility

Whereas the five Cognitive Constancies are the 'inner' dimensions of FITness, behaviour is the 'outer' and observable dimension of the FIT Framework. Accordingly, the behaviour of individuals with a higher level of personal FITness is said to be guided by FIT Integrity and the Constancies, and is performed in accordance with intentions and as appropriate to the circumstance. The same cannot be said for individuals with lower levels of personal FITness. These individuals often behave in a habitual way and rely on past behaviours to guide future actions.

The FIT Profiler (Fletcher, 1999) measures 15 behavioural dimensions defined by the FIT Framework, and specifically measures the degree of flexibility in each. The behavioural dimensions are defined by Fletcher and Stead (2000) as providing the 'blueprint' that allows individuals to behave effectively or flexibly across different situations. The behaviours are not considered as fixed traits but as competencies that are trainable and can be developed. Each of the 15 behavioural aspects is bi-dimensional and offers the range of possible behaviours that an individual might display, depending on the situation. For example, on one of the behavioural dimensions, Assertiveness, the individual can indicate the extent to which they demonstrate the behaviour at both ends of the dimension, i.e., the extent to which they are sometimes Assertive and at other times Unassertive. The FIT Profiler measures such Behavioural

Flexibility and can direct its development through a structured programme of behaviour change.

The behavioural dimensions measured by the FIT Profiler (Fletcher, 1999) are: (1) unassertive - assertive; (2) trusting of others - cautious of others; (3) calm/relaxed - energetic/driven; (4) reactive - proactive; (5) definite - flexible; (6) predictable - unpredictable; (7) risk-taking - cautious; (8) behaving as expected - behaving as you wish; (9) spontaneous - systematic; (10) single-minded - open-minded; (11) introverted - extroverted; (12) conventional - unconventional; (13) individually centred - group centred; (14) firm - gentle; (15) lively - not lively.

Fletcher and Stead (2000, p.22) suggest that most people will have a "comfort zone" on each behavioural dimension. It is likely that this will reflect personal preferences and the way in which someone typically behaves in a given situation; in other words, it reflects their habitual tendencies. FIT theory acknowledges that as well as identifying personal preferences in each of the cognitive and behavioural dimensions, it is also important to offer a framework to encourage behaviour change and personal development. This suggestion concurs with the results of the literature review; there is a need for more models of behaviour that have both validity and utility. The purpose of the associated FIT-Do Something Different (FIT-DSD) intervention is to expand the size of personal "comfort zones" so that these exceed the "discomfort zone" (Fletcher & Stead, 2000, p.22). By extending their behavioural comfort zone, people might be better equipped to behave appropriately and flexibly in accordance with circumstance, and as guided by their conscious cognitions (Constancies). In other words, people might be less habit-bound and therefore able to align behaviours with intentions.

With regards to environmentally sustainable lifestyles, it is suggested that individuals with higher levels of Behavioural Flexibility might be more pro-environmental in their approach because they are more capable of adapting to new challenges such as climate change, and developing new behaviours in accordance with these. Behavioural Flexibility might not, however, have a direct effect on environmental sustainability but rather an effect that is indirect. Higher levels of Behavioural Flexibility might help people to be less bound by habits and behave in accordance with current circumstance. As such, those individuals with higher levels of Behavioural Flexibility might have a higher propensity to develop and embed pro-environmental behaviours in their behavioural repertoires, and be more willing and able to change behaviour as required.

2.2.3 The Relationship between FIT Integrity and Behavioural Flexibility

As described above, the strength of an individual's Constancies and their degree of Behavioural Flexibility might be separately important for determining the level of pro-environmental activity in personal lifestyles. In addition, the relationship between both dimensions might also be an important consideration. The FIT Framework emphasises a bi-directional connection between people's cognitions and their behaviour. It suggests that Constancies can guide effective and flexible decision-making and behaviour and, in return, the experiences that are encountered can, through behavioural feedback, help to develop the Constancies further. The strength of this bidirectional relationship, particularly the effect of actions on thoughts, has often been underplayed in other models of behaviour and frameworks for behaviour change (see Chapter 1).

In the FIT Framework thoughts are measured by the cognitive Constancies. These can provide the foundation for action (or inaction); they guide decision-making and behaviour. As such, they can act as a direct or indirect target for behaviour change interventions. A direct approach to change would seek to develop the strength of each Constancy in order to lever changes in behaviour. This is the approach supported by most existing psychological models of behaviour and frameworks for behaviour change that assume the position of bounded rationality. However, as discussed previously, this method does not always result in new behaviour, especially when existing patterns of behaviour are characterised by habit. Consequently, this can result in the thinking-action gap that is so often seen (see Blake, 1999; Klöckner & Blöbaum, 2010). An alternative approach would be to change cognitions indirectly by developing behaviour. According to this perspective, which subsumes an action-oriented approach, behaviour is targeted directly to leverage indirect changes in thinking. In other words, existing habits are targeted directly and by behaving differently, people have different experiences and start to think differently as a result. The behaviour change approach supported by the FIT Framework, historically called Do Something Different (DSD), uses both an indirect and direct approach to encourage behaviour change. By simultaneously targeting cognitions and behaviour (i.e., behaviour independent of cognitions), DSD might be a useful alternative approach for pro-environmental behaviour change. Chapter 7 describes in more detail the application of DSD to pro-environmental activity.

2.2.4 Thoughts and Feelings

The third dimension of the FIT Framework is affect. This relates to personal levels of free-floating anxiety and depression. It is important to determine an individual's level of anxiety

and/or depression, as emotions like these can underpin cognition and behaviour, and determine the way a person perceives their world and how they behave within it. As described in the HOT topics framework (Page & Page, 2011), it can take just a single negative environmental thought to block action entirely.

According to Fletcher and Stead (2000), high levels of anxiety and/or depression can unbalance the connection or the harmony among the Constancies and therefore leave the individual more vulnerable to less effective decision-making and behaviours. Fletcher and Stead (2000) suggest that individuals with higher levels of personal FIT will have lower levels of anxiety and depression.

2.3 The Practical Applications of the FIT Framework

Existing empirical investigations of the FIT Framework have focused on the following three assumptions:

1. Individuals who have higher levels of personal FITness are likely to function more effectively in different areas of life because they are more adaptable/flexible in the way they approach and solve problems. In other words, they might be bound less by habit. This programme of research will explore the relationship between personal FITness and measures of pro-environmental activity and environmental sustainability. In particular, Studies 1 and 2 (see Chapter 3) will explore whether people who have higher levels of FITness are: more pro-environmental in their thinking and behaviour; are more concerned for the environment; and more willing to change their behaviour for environmental protection. Any relationships would indicate an individual's adaptability to potential future challenges.

2. The FIT Framework predicts that there is likely to be a close link between the Constancies and feeling anxious and/or depressed. Indeed, individuals with higher Constancy scores are expected to report lower levels of anxiety and depression because of their likely higher Awareness and Self-responsibility levels, which will enable them to perceive the reality of situations and take responsibility for what happens in life; their lower levels of fear (higher Fearlessness) should minimise the anxiety related to the demands of different situations. Affect is of less importance for this programme of research and its relationship to pro-environmental behaviour is only reported briefly in Studies 1 and 2 (see Chapter 3).

3. Personal levels of FITness, both cognitive and behavioural, can be trained by developing Behavioural Flexibility and making people less bound by habit. The premise is that changes in behaviour can be used as a lever to change thinking, and by disrupting individuals' existing

daily habits and routines that are likely to constrain cognitions, it might be possible to help people to become more open and adaptable in both their thinking and behaviour. This programme of research will consider whether the application of a change framework designed to expand both cognitive and behavioural repertoires through habit-reversal and new habit-rehearsal, will help individuals to engage with environmental sustainability and act more pro-environmentally on a day-to-day basis. A FIT-DSD intervention approach for developing environmentally sustainable lifestyles will be proposed in Chapter 7.

2.4 Empirical Research on the FIT Framework

There have been several research studies that have explored the practical applications of the FIT Framework. All of these studies have been outside of the environmental sustainability arena. This is, as far as I am aware, the first exploration of the relationship between FIT variables and pro-environmental activity. Previous applications of FIT are based on the general assumptions outlined above. These assumptions suggest two things: firstly, that individuals with higher levels of FITness are likely to perform better in different areas of life and be less stressed because they are more flexible in the way they think and behave; and secondly, that personal FIT levels are trainable and can be developed.

Initial applications of the FIT Framework started in the area of occupational health, with a particular focus on whether stress resides in the person or the world. Theoretically, FIT Science suggests that stress is inherently within the person and is manifested by individual perceptions of the situation and the application of personal resources for coping. Fletcher (2007a) conducted a study to compare the stress scores of a sample of managers working globally in a variety of different roles for an international bank (n = 391) with a sample of supermarket checkout workers all in the same work roles (n = 47). The aim of the study was to investigate how perceptions of work differed according to levels of personal FITness. Using the FIT Profiler and the Work-FIT Profiler (Fletcher, 1999) psychometrics, the results showed that in both samples, employees with higher FIT scores, particularly FIT Constancies, reported less work-related stress in areas such as satisfaction with the company, work demands, supports and relationships, control, and strain. Employees with higher FIT Constancy levels appraised their work environment differently, and overall more positively, compared with employees with lower reported Constancy levels. For the supermarket workers who were all doing essentially the same jobs, the variation in their work demand and support scores was as great as the differences between the different jobs in the bank (Page, Michaelides & Fletcher, 2008). These results suggest that levels of personal FITness might influence how people construe their work

and the world around them, how they interact in different circumstances, and the level of success or stress subsequently experienced.

With regard to the second assumption, a cross-sectional study conducted by Fletcher (2007b) investigated the relationship between FIT variables and levels of personal stress in the general population (N = 351), as measured by depression and free-floating anxiety using the Thoughts and Feelings Scale of the FIT Profiler. This study found that individuals who had higher levels of FIT Integrity and Behavioural Flexibility reported lower levels of depression and anxiety. The negative correlations were moderate in strength, specifically -.51 and -.64 for the relationships between FIT Integrity and depression and anxiety, respectively. What these relationships show is that personal FIT characteristics have an influence on how people respond, cope and are personally affected by life events or, put differently, how they respond to the challenges they might encounter in day-to-day life.

To illustrate, one recent example of the more effective coping of individuals with higher levels of FITness relates to perceptions of family functioning and stress. In a series of studies, Sharma (2011) found that individuals with higher levels of FITness perceived their family functioning as overall more positive and less stressful than individuals with lower levels of FITness, and this relationship was apparent in the general population and specifically for mothers of typically developing children and those with Autistic Spectrum Conditions (ASCs). Furthermore, this collection of studies also showed that the FIT Framework had a practical application for helping mothers to deal with the challenges of family life, including stress, depression, and relationship satisfaction.

The third assumption of FIT Science, that cognitive and behavioural strengths should be trainable and can be developed by expanding a person's behavioural repertoire, has been explored in a series of studies using the FIT-Do Something Different methodology. For example, Fletcher (2007c) reports the results of an intervention designed to reduce the elevated stress levels of employees (N = 34) who either volunteered to participate in the study or were referred by their organisation. For 1 month, employees engaged with a FIT-Do Something Different intervention that focused on them completing a task each day to expand their general repertoire of behaviour in order to bring about changes in their Constancies. The results showed that the pre- to post-intervention FIT Profiler scores increased. Both FIT Integrity and Behavioural Flexibility scores (scale ranges 0-100) increased significantly from 58.5 to 67.3 and 14.7 to 28.9, respectively, and these increases were associated with decreases in levels of anxiety and depression. At the start of the study, 53% of employees had depression scores in

the clinical range and this reduced to 12% after completing the intervention. As there was no control group included in this study it is not possible to establish cause and effect in relation to the changes. However, the results do support a relationship between personal levels of FITness and stress. They also attest that personal levels of FITness, both cognitive and behavioural, are not fixed entities; they are trainable and can be developed.

In a different series of studies, Fletcher and colleagues explored the relationships between levels of personal FITness and an individual's engagement and success with personal projects (Little, 1983), some of which related to health outcomes. For example, Hanson (2008) reported that individuals with higher levels of FIT Integrity not only reported lower levels of anxiety and depression (as per previous studies by Fletcher, 2007a, 2007b, 2007c) but they also perceived their work and personal projects more positively. Hanson (2008) also found that Behavioural Flexibility positively related to physical wellbeing and that a FIT-DSD intervention designed to facilitate weight loss enabled individuals to develop their level of Behavioural Flexibility in a dose-relationship with BMI change; the greater the increase in Behavioural Flexibility, the greater decrease in BMI. This study compared the FIT-DSD intervention group with a wait-listed control group and found that individuals in the FIT-DSD intervention group lost more weight compared with those in the control group.

Following Hanson's work, Fletcher and colleagues conducted a series of studies to further elucidate the role of the FIT Framework and more formally develop and explore the FIT-DSD intervention in behaviour-change efforts specifically focused on weight loss. In their first pilot study, Fletcher, Page and Pine (2007) found that after a 1-month FIT-Do Something Different intervention all-bar-one participant had lost weight, with a mean weight loss of 2.61kgs. Weight loss also continued post-intervention. This suggests that the lifestyle changes adopted during the intervention were maintained beyond the short-term. Subsequently, in another small-scale study, Page and Fletcher (2008) showed that the weight losses of participants were attributable to the FIT-DSD intervention and were not simply due to the demand characteristics of the study or intervention. The observed reductions in BMI were seen only in the FIT-DSD group and not in the comparative narrative control group. More recently, Fletcher et al (2011) found a dose-relationship between FIT Behavioural Flexibility and reductions in BMI that was no more effective for people who were also dieting.

These studies lend support to the relationship between FIT variables and different lifestyle indices. They show the wide applicability of the FIT Framework for understanding how people behave in different areas of life. This programme of research seeks to investigate the FIT

Framework in a new and very timely domain, environmental sustainability. Based on the theoretical and empirical research described, it is anticipated that people who have higher levels of personal FITness (FIT Integrity and Behavioural Flexibility) might perceive the realities of anthropogenic climate change and environmental sustainability with more transparency and urgency, and use these cognitions to initiate and guide pro-environmental actions. In other words, individuals with higher levels of FITness might be more aware of the impact of their behaviour and to the opportunities that they have for mitigating this impact. Their proposed higher levels of flexibility also means that they might have a larger range of behaviours to implement change.

2.5 FITness and Environmental Sustainability

In many ways pro-environmental behaviours present a different challenge for the FIT Framework and the FIT-DSD approach. The most obvious distinction is the personal relevance of environmental sustainability as an outcome. Compared with the outcome measures used in previous research, e.g., weight loss and quitting smoking, where individuals change their behaviour for personal reward, environmental sustainability is likely to have less personal relevance and might create greater resistance, for some individuals at least. This could impact the relationship and overall commitment to engage (Lokhorst, Werner, Staats, van Dijk & Gale, 2013). Furthermore, by definition, developing levels of personal sustainability and leading an environmentally sustainable lifestyle involves multiple changes, and perseverance with actions that are performed in different contexts, at different time-points throughout the day/week/month/year, and in the presence of variable social pressures. It involves multi-level change across several behaviours, with the potential of developing whole behavioural sets that are more environmentally sustainable, rather than focusing specifically on one or two behaviours. These characteristics make change for environmentally sustainable lifestyles a particular challenge.

There is, however, reason to believe that the variables outlined in the FIT Framework might be related to pro-environmental behaviours and that the FIT-DSD approach could be an effective alternative intervention for pro-environmental lifestyle change. In fact, with consideration given to the results of the literature review, the FIT Framework offers greater potential to support the development of multiple pro-environmental behaviours, and resist the influence of existing habits in the longer-term. The fact that the FIT Framework has been applied to a broad range of different personal projects (Little, 1983) including weight loss and eating habits (Fletcher et al, 2011; Fletcher et al, 2008; Page & Fletcher, 2007), family functioning (Sharma,

2011), stress (Fletcher, 2007a), and quitting smoking (Pine & Fletcher, 2011) suggests that it too could be important for helping people to develop lifestyles that are more environmentally sustainable.

In line with this reasoning, this research will explore for the first time, the function of the FIT Framework for understanding those cognitive, behavioural and, to some extent, affective characteristics of individuals that might have a relationship with environmental sustainability and pro-environmental activity in day-to-day life.

As discussed previously, there exist several different frameworks of pro-environmental behaviour and models of behaviour change (see Chapter 1). The FIT Framework and FIT-DSD offer alternative psychological approaches. They are, however, relatively novel perspectives that have so far received a limited amount of empirical exploration. The first step, therefore, is to establish if there are any empirical relationships between FITness and pro-environmental activity and, if so, what these might comprise. What follows in Chapter 3 is a description of the first empirical research exploring the relationship between FIT variables and indices of pro-environmental activity.

3 The Empirical Relationship between the FIT Framework and Environmental Sustainability

3.1 Introduction

This Chapter presents two empirical studies that explore the relationships between FIT variables and a range of pro-environmental indices. Study 1 is an exploratory pilot study designed to explore the proposed relationships between FIT variables and a range of pro-environmental activity measures. It used a short version of the FIT Profiler (Fletcher, 1999) for two reasons: first, because this was the first empirical exploration of the relationships; and secondly, to ensure that the complete questionnaire pack was not too onerous for participants to complete. Study 2 explored the relationships between FIT variables and environmental sustainability in a different sample using the full version of the FIT Profiler. Based on the findings of Study 1, a refined set of environmental sustainability indicators was used in Study 2 and this included only three of the original scales used in Study 1. The cognitive (FIT Integrity and Constancies), behavioural (Behavioural Flexibility), and affective (Anxiety and Depression) aspects of FIT were measured using the full version of the FIT Profiler (Fletcher, 1999).

The studies explored the following research questions:

1. Are personal levels of FITness related to people's *cognitive beliefs* about environmental sustainability issues? This is important because, as discussed previously, people can become entwined in habitual thinking and might be unaware both of the problems of climate change as well as of the pro-environmental options that are available to them. They might likewise be cognitively unaware of their own behaviours and the impact that these have on their personal sustainability. Some of the existing models of pro-environmental behaviour and frameworks for behaviour change have focused on factors that are fixed or difficult to develop (e.g., values, beliefs, norms, demographic variables, and personality; Abrahamse & Steg, 2009). As such, these might lack a useful approach to change behaviour. The FIT Framework (Fletcher & Stead, 2000) focuses on personal resources that, it is believed based on the results of previous empirical research, are trainable and can be developed. Based on the relationships proposed between FIT variables and cognitive awareness (see Chapters 1 and 2), Studies 1 and 2 explore whether or not FIT variables relate to people's cognitive environmental beliefs.
2. Are personal levels of FITness related to how people *behave* in relation to environmental sustainability issues? Based on the relationships proposed between FIT variables and

behaving appropriately, flexibly, and as intended, Studies 1 and 2 explore whether or not FIT variables are related to the frequency of pro-environmental behaviour and willingness to change behaviour.

3. Do personal levels of FITness relate to how people *feel* about environmental sustainability issues? Distorted negative emotions can be a barrier to engaging with sustainability issues (De Groot & Steg, 2007; 2008). Based on the association between FIT variables and lower levels of negative affect (measured as free-floating anxiety and depression), Studies 1 and 2 explore whether or not FIT variables relate to concerns and beliefs about environmental problems.
4. Are pro-environmental beliefs/concern, cognitive beliefs, and pro-environmental behaviour related? Disengagement with environmental sustainability can occur at an affective, cognitive, or behavioural level. These dimensions are often related but they can also be separated by habit (see Page & Page, 2011). Because of their proposed interconnectedness, Studies 1 and 2 explore the strength of the relationships amongst these variables and consider whether this is related to levels of personal FITness.
5. Do people think differently about environmental sustainability issues in different contexts, and is there a difference in the performance of pro-environmental behaviours according to site of practice? Pro-environmental behaviours can be performed routinely in specific contexts, as habits that are triggered by cues in the environment (see Neal, Wood & Quinn, 2006; Aarts & Dijksterhuis, 2000). If pro-environmental behaviours are characterised by habit rather than directed by intention, there is a greater possibility that a change in context could disrupt performance significantly and result in inconsistency across different contexts. Studies 1 and 2 explore whether or not cognitive environmental beliefs and behaviour change according to a change in context, and whether any change is related to level of FITness.

3.2 Studies 1 and 2

3.2.1 The Hypotheses

The hypotheses for Study 1 are exploratory and were tested 2-tailed to $p < .05$. As Study 2 sought to confirm these relationships, the inferential analysis were conducted 1-tailed to $p < .05$, unless indicated otherwise. Six hypotheses were set:

H_{1a}: People scoring higher on FIT variables (as measured by the FIT Profiler) will be more cognitively aware of environmental sustainability issues (as measured by the cognitive environmental beliefs scales).

H_{1b}: People scoring higher on FIT variables (as measured by the FIT Profiler) will be more engaged behaviourally with environmental sustainability issues (as measured by the home and work pro-environmental behaviour scales).

H_{1c}: People scoring higher on FIT variables (as measured by the FIT Profiler) will be more willing to change their behaviour in the direction of greater environmental sustainability (as measured by the willingness to change scale).

H_{1d}: People scoring higher on FIT variables (as measured by the FIT Profiler) will be more concerned about environmental sustainability issues (as measured by the environmental concern and affective environmental belief scales).

H_{1e}: There will be a spillover in pro-environmental behaviour according to context and this will be smaller for individuals with lower levels of FITness (as measured by the FIT Profiler).

H_{1f}: The presence of an environmental policy at work will have a positive effect on pro-environmental behaviour, and the effect will be larger for individuals with higher levels of personal FITness.

3.2.2 Respondents

As these studies were the first empirical investigations of the relationships between FITness and pro-environmental activity, I explored the relationships in samples that were as diverse as possible. With this in mind, online surveys were used to capture the relationships in two cross-sectional samples. The respondents were recruited through convenience sampling. All respondents were self-selecting volunteers to the research. They were recruited in 3 ways: student respondents were recruited from a UK university via an electronic research participation system; student and non-student respondents were recruited from advertisements on two research participation websites; and non-student respondents (family and friends) known to the researcher were recruited in person via verbal or email communication.

The online surveys were live for approximately two months. In Study 1, inspection of the raw data showed that 431 respondents started the questionnaires (326 for Version A and 105 for

Version B) and 325 completed it in full (238 (73%) completers for Version A and 87 (83%) for Version B). This equated to a 75% completion rate overall. The data collected for Study 2 showed that 142 respondents started the questionnaire and 134 respondents completed it in full (94% completion rate). Incomplete entries were removed from the data file prior to analysis. The total samples were *N* = 325 and *N* = 134 for Study 1 and Study 2, respectively.

3.2.2.1 Study 1

Respondents in Study 1 were *N* = 325 individuals (*n* = 87 (27%) male; *n* = 237 (73%) female), ages ranged from 17 to 71 years (*M* = 28.36, *SD* = 11.81). Two hundred and twenty four (69%) respondents were of white-British origin; *n* = 58 (18%) were Asian; *n* = 12 (4%) were Black; *n* = 7 (2%) were Chinese; *n* = 7 (2%) were of mixed race; and *n* = 8 (4%) other ethnicities. Regarding job type, *n* = 157 (48%) respondents were studying or in education; *n* = 47 (3%) were in administrative/secretarial roles; *n* = 86 (26%) were in professional roles; *n* = 22 (7%) were in managerial roles; *n* = 7 (2%) were self-employed; and *n* = 5 (2%) were unemployed. One respondent did not report their type of work. Regarding highest educational qualification, *n* = 6 (2%) respondents had a PhD; *n* = 37 (11%) had an MSc degree; *n* = 108 (33%) had a BSc degree; *n* = 162 (50%) had A-Levels; and *n* = 11 (4%) had GCSEs. One reported no educational qualifications.

Ethical approval was sought and granted from the Psychology Ethics Committee at The University of Hertfordshire prior to data collection (ethics approval codes: Study 1: PSY/11/08/MS and Study 2: PSY/01/09/JLP).

3.2.2.2 Study 2

Respondents in this study were *N* = 134 individuals (*n* = 33 (25%) male; *n* = 101 (75%) female), aged between 18 and 80 years (*M* = 27.35, *SD* = 12.59). Eighty-seventy respondents (65%) were of white-British origin; *n* = 23 (17%) were Asian; *n* = 14 (10%) were Black; *n* = 2 (2%) were of mixed race; and *n* = 8 (6%) other ethnicities. Regarding lifestyle characteristics, *n* = 45 (34%) respondents lived in a property owned by their parent(s); *n* = 35 (26%) lived in a property they owned; *n* = 31 (23%) rented their property; *n* = 20 (15%) were in student halls; and *n* = 3 (2%) reported 'other'. Regarding job type, *n* = 81 (60%) respondents were studying or in education; *n* = 24 (18%) were in professional roles; *n* = 19 (14%) were in administrative/secretarial roles; *n* = 3 (2%) were self-employed; and *n* = 2 (1.4% were at home or not working). For those in employment, the job roles were varied and included: Safety Manager; Manual Labourer; Chemist; Assistant Manager; General Assistant; Cleaner; Secretary; and Nurse. Regarding

highest educational qualification, *n* = 1 (<1%) respondent had an MSc degree; *n* = 15 (11%) had a BSc degree; *n* = 97 (72%) had A-Levels; and *n* = 18 (13%) had GCSEs. Three (2%) respondents reported no educational qualifications.

3.2.3 Materials

The data were collected using a questionnaire pack composed of several scales. In order to include more criterion measures, three different versions of the questionnaire pack were created (A, B, & C, see Appendix A) and administered to different respondents to ensure that each questionnaire pack was not overly long or arduous to complete. There were two different versions of the questionnaire in Study 1 (A & B) and a third version in Study 2 (C). These are summarised in Table 3.1.

3.2.3.1 Questionnaire Packs A, B, and C

The following measures, along with questions assessing demographic and lifestyle information (e.g., age, gender, ethnicity), were included in all versions of the questionnaire.

3.2.3.1.1 Indicators of environmental sustainability

Both cognitive and behavioural aspects of pro-environmental activity were measured. The scales measured pro-environmental thinking and behaviour in a systematic way by assessing a similar range of activities in each scale so that direct comparisons could be made.

3.2.3.1.2 Cognitive environmental beliefs

This scale was composed of 37 items. It measured a cognitive aspect of environmental sustainability and asked respondents to rate the importance of a range of everyday pro-environmental behaviours for protecting the environment (e.g., "recycling materials") on a 7-point scale from 1 (*extremely unimportant*) to 7 (*extremely important*). Higher scores on the scale (min. = 37; max. = 259) represented stronger cognitive environmental beliefs, i.e., respondents think that the behaviours are important for protecting the environment.

3.2.3.1.3 Home pro-environmental behaviour

This scale measured how frequently respondents engaged in pro-environmental behaviours in a home context. It was composed of 27 items, which were, where possible, identical to the items in the cognitive environmental beliefs scale, measured on a 6-point scale from 0 (*never*) to 5 (*always*). Higher scores on the scale (min. = 0; max. = 135) represented greater engagement in pro-environmental behaviours in a home context.

Table 3.1. An overview of the questionnaire scales used in Studies 1 and 2

		Study 1		Study 2
Section	**Scale**	**Questionnaire A**	**Questionnaire B**	**Questionnaire C**
Indicators of sustainability	Cognitive environmental beliefs	/	/	/
	Home pro-environmental behaviour	/	/	/
	Work pro-environmental behaviour	/	/	/
	Environmental concern	/		
	Willingness to change	/		
	Past cognitive environmental beliefs	/		
	Past home pro-environmental behaviour	/		
	Past work pro-environmental behaviour	/		
	New Ecological Paradigm (affective beliefs)		/	
FIT Profiler	Behavioural Flexibility	/	/	/
	Integrity – short	/	/	
	Integrity – long			/
	Thoughts & Feelings	/	/	/
Lifestyle indicators	Demographic and lifestyle questions	/	/	/
Sample size N =		*238*	*87*	*134*

3.2.3.1.4 Work pro-environmental behaviour

This scale measured how frequently respondents engaged in pro-environmental behaviours in a work context. It was composed of 24 items, which were, where possible, matched to items in the home pro-environmental behaviour scale, measured on a 6-point scale from 0 (*never*) to 5 (*always*). Higher scores on the scale (min. = 0; max. = 120) represented greater engagement in pro-environmental behaviours in a work context.

3.2.3.1.5 The FIT Profiler – short form

A short version of the FIT Profiler (Page & Fletcher, 2006) was used in Study 1 to measure FITness. The short version was chosen to reduce the overall length of the questionnaire packs and align with the exploratory nature of the study. The items included were determined by a

psychometric report produced by Page and Fletcher (2006). It was composed of a total of 20 items that measured Behavioural Flexibility (15 items) and the Cognitive Constancies (5 items).

3.2.3.1.6 Behavioural Flexibility

This scale measured the size of an individual's behavioural repertoire. It was composed of 15 items taken from the FIT Profiler (Fletcher, 1999), which represent different bipolar dimensions of behaviour, e.g., "proactive vs. reactive", "extroverted vs. introverted" (see Table 3.2). Respondents indicated their range of behaviour or the size of their behaviour repertoire on an 11-point scale. The scale represented the two poles of the behaviour in question, with 0, the middle point, representing behaviour that is neither one nor the other. Respondents who are behaviourally flexible will indicate a large range of behaviours, i.e., their response will span from one end of the scale to the other, whereas respondents who are less flexible will indicate a narrower response that is typically situated at one end of the scale. For example, upon being asked the question:

"Do you behave in an assertive or unassertive manner?"

The respondent would indicate his/her answer on the following scale:

5	4	3	2	1	0	1	2	3	4	5
Assertive					Neither one nor the other					Unassertive

If a respondent feels that they are generally assertive, then they would indicate a narrow range and circle the 5 above 'Assertive'. However, on occasion, they might feel they are somewhere in the middle ('neither one nor the other') and assertive, in which case they would circle 0 and the 5 above 'Assertive', and join them together. Some individuals may feel they are prone to be assertive and unassertive. If this were the case, the individual would circle both 5s and join them together. This would indicate the entire range of the behaviour dimension and would result in the largest score.

Table 3.2. Study 1 and Study 2 – Behaviour dimensions in the FIT Profiler

Pole 1		**Pole 2**	**Pole 1**		**Pole 2**
Assertive	vs	Unassertive	Behave as I wish	vs	Behave as others expect
Conventional	vs	Unconventional	Systematic	vs	Spontaneous
Cautious	vs	Trusting	Open-minded	vs	Single-minded
Predictable	vs	Unpredictable	Extroverted	vs	Introverted
Energetic/Driven	vs	Calm/Relaxed	Definite	vs	Flexible
Reactive	vs	Proactive	Lively	vs	Not lively
Group orientated	vs	Individually orientated	Gentle	vs	Firm
Risk taker	vs	Cautious			

A total Behavioural Flexibility score is computed from the range scores of the 15 items and scaled to 100 for convenience (min. = 0; max. = 100). A higher score indicates a larger repertoire of behaviours, hence more Behavioural Flexibility and higher FITness.

3.2.3.1.7 Cognitive Constancies and FIT Integrity

The Cognitive Constancies of Awareness, Balance, Conscience, Fearlessness and Self-responsibility were each measured by one item (see Table 3.3). The item used for each Constancy was determined by a previous study that identified the psychometric properties of the FIT Profiler (Page & Fletcher, 2006). The strongest loading item for each Constancy scale was used in this shortened version of the scale. Each Constancy was measured on a 0-10 scale with higher scores equating to higher levels of Awareness, Balance, Conscience, Fearlessness and Self-responsibility. A total score of FIT Integrity was computed from the Constancy scores, again scaled to 100 for convenience. Higher scores (min. = 0; max. = 100) indicate higher levels of FIT Integrity.

The psychometric report produced by Page and Fletcher (2006) identified the psychometric properties of the FIT Profiler in a sample of 1325 respondents. The results demonstrated good internal consistency for the Cognitive Constancies: Cronbach's alpha values ranging from .67 (Self-responsibility) to .87 (Fearlessness); FIT Integrity = .87; Behavioural Flexibility = .91; and Overall FIT = .90. The test-re-test coefficients ranged from .40 for Balance to .89 for Overall FIT.

Table 3.3. Study 1 – Constancy items included in the short version of the FIT Profiler

Constancy	Item
Awareness	Are you always clear as to why you did something or are you often surprised?
Balance	When at work is your mind on other things?
Conscience	Do you believe you have to tell lies to succeed?
Fearlessness	Do fearful feelings stop you from doing things you want to do?
Self-responsibility	Do you feel in control?

3.2.3.1.8 Thoughts and Feelings

This section of the FIT Profiler contains 8 items to measure levels of free-floating depression and anxiety – four items for each dimension (see Table 3.4). Each item specifies a symptom and participants respond by indicating the extent to which this has applied to them over the past few weeks. Responses are indicated using a 4-point scale ranging from *'never'* to *'very frequently'* with total scores on each scale ranging from 4 to 16. Higher scores are more problematic.

Table 3.4. Study 1 – The Thoughts and Feelings scale of the FIT Profiler

Scale	Item
Anxiety	Finding it difficult to "think on the spot" and concentrate
	Feeling as if you're "falling apart at the seams" but unsure why
	Feeling uneasy and needing to "escape"
	Worrying about things which causes feelings of tension and strain
Depression	Feelings of sadness first thing in the morning
	Feeling low and wanting to give up trying
	Lack of interest and enjoyment in food
	Feeling life is difficult to cope with

In the psychometric report by Page and Fletcher (2006), the Thoughts and Feelings scales showed good internal consistency and test re-test reliability (Cronbach's alpha > .76), and convergent validity with reference to other measures of anxiety and depression (e.g., DASS, STAIT-T and BDI).

3.2.3.1.9 Demographic and lifestyle questions

Respondents were asked to indicate their age; gender; ethnicity; highest education qualification; work/education status; and work/education hours. In Version A of the questionnaire, respondents were also asked to indicate their annual income; property type; property ownership; and whether they had an environmental policy at their place of work or study.

3.2.3.2 Questionnaire Pack A

Version A of the questionnaire also included the following measures.

3.2.3.2.1 Past cognitive environmental beliefs

This scale measured respondents' past cognitive environmental beliefs. The scale items were identical to the previously described cognitive environmental beliefs scale but respondents were instructed to reflect and complete the scale for their thinking 2-years ago. The total scores were scaled to 100.

3.2.3.2.2 Past home and work pro-environmental behaviours

The items of these scales were identical to the home and work pro-environmental behaviour scales respectively, but these versions measured respondents' performance of pro-environmental behaviours 2-years ago. The total scores were scaled to 100.

3.2.3.2.3 Willingness to change behaviour

This scale measured how willingly respondents would change their behaviour in order to protect the environment. The scale was composed of 36 pro-environmental behaviours measured on a 5-point scale (1 = *strongly disagree*; 5 = *strongly agree*) with total scores scaled to 100 for convenience. Higher scores (min. = 0; max. = 100) represent greater willingness to change and the potential take more pro-environmental action.

3.2.3.2.4 Environmental concern

This scale measured respondents' strength of concern for the environment on a 10-item scale. When completing, respondents rated their agreement (1 = *strongly disagree*; 5 = *strongly agree*) to statements about the environment (e.g., "I worry about environmental problems"). The total score, scaled to 100 for convenience (min. = 0; max. = 100), indicates an individual's overall level of environmental concern with higher scores showing greater concern.

3.2.3.3 Questionnaire Pack B

Version B of the questionnaire pack also included the following measures.

3.2.3.3.1 The New Ecological Paradigm (NEP)

This scale measured respondents' feelings/attitude towards the world and their environment (Dunlap et al, 2000) – their affective environmental beliefs. The scale is composed of 15 items, which cover five facets: the reality of limits to growth, antianthropocentrism, the fragility of nature's balance, rejection of exemptionalism, and the possibility of eco-crisis. Each item is measured on a 5-point scale ranging from *strongly disagree* (1) to *strongly agree* (5). There are seven negative anthropocentric items and eight positive eco-centric items; disagreement with the former and agreement with the latter indicates a pro-NEP worldview/attitude. The negative items are reverse scored in order to calculate a total score for each participant that ranges from 15 to 75. The closer the score is to the maximum of 75, the stronger the respondents' pro–environmental worldview/attitude. An anthropocentric worldview refers to having beliefs that human beings are of central importance and have pre-eminence over all other aspects of existence, whereas eco-centrism acknowledges the importance of the environment and the fact that all organism are of equal importance for the existence of life.

3.2.3.4 Questionnaire Pack C

The cognitive environmental beliefs and behaviour scales used in Study 1 were also used in Study 2 (see descriptions above) along with questions assessing demographic and lifestyle information (e.g., age, gender, and ethnicity). The full FIT Profiler and Thoughts and Feelings scales were used to explore further the relationships between FIT variables and environmental sustainability. The environmental concern and willingness to change scales were not included in this questionnaire pack (see Appendix A).

3.2.3.4.1 The FIT Profiler

The full version of the FIT Profiler scale (Fletcher, 1999) was used in Study 2 to measure the cognitive, behavioural and emotional aspects of FITness in more detail. The scale was composed of 83 items, which measured three dimensions of FIT: Integrity (50 items), Behavioural Flexibility (15 items) and Thoughts and Feelings (8 items). There were also 10 items that measured the degree to which individuals socially shape their responses. The data for this scale were not analysed here.

3.2.3.4.2 Behavioural Flexibility

This scale was identical to the scale used in Study 1. It measured the size of respondents' behavioural repertoires using 15 bipolar dimensions of behaviour (see Table 3.2). The total Behavioural Flexibility scores were scaled to 100 for convenience.

3.2.3.4.3 Cognitive Constancies and FIT Integrity

This scale measured the FIT Cognitive Constancies of Awareness, Balance, Conscience, Fearlessness and Self-responsibility using the full FIT Integrity scale (see Table 3.5). The scale was composed of 50 items and each Constancy was measured by 10 items, which were scored on a 0-10 scale with higher scores equating to higher levels of the Constancy. An overall score for each Constancy was computed from the mean of the 10 items. Higher scores (min. = 0; max. = 10) show higher levels of the Constancy. A total score called FIT Integrity was computed from the five Constancy scores and scaled to 100 for convenience (min. = 0; max. = 100).

3.2.4 Procedure

The data for Studies 1 and 2 were collected either electronically using Survey Monkey or using a paper version of the same questionnaire. There were no differences in the content of the questionnaire between the two versions. All data were collected anonymously. The questionnaire packs contained detailed instructions, and although they were not uncomplicated, responses suggested that respondents had understood the instructions. At the close of the survey (approximately 2-months after it went live) the data were downloaded to Excel and then exported to SPSS for analysis.

Respondents who completed the questionnaire in hard copy received a paper version of the questionnaire, which was printed from Survey Monkey, and a pre-paid addressed envelope for anonymously returning it to the researcher. Data from the hard copies of the questionnaire were entered directly into the SPSS file by the researcher.

3.2.5 Data Preparation

As there were several scales in the different versions of the questionnaires, and many of these contained a different number of items, the total scores for the cognitive environmental beliefs and behaviour, willingness to change, environmental concern, FIT Integrity and Behavioural Flexibility scales were scaled to 100 for convenience, and to make the scores easier to compare in the present and subsequent analyses. This transformation was not conducted on the NEP

scale as it has already a well-established scale, or the individual Constancies or Anxiety and Depression scales, as these were much shorter scales overall.

Table 3.5. Study 2 – Constancy items in the full FIT Integrity scale of the FIT Profiler

Scale				
Awareness	**Balance**	**Conscience**	**Fearlessness**	**Self-responsibility**
Are you aware of what you are doing?	When work is over, can you relax?	Do you think that moral and ethical standards have to be compromised to achieve success?	Does the thought of failure fill you with fear?	Do you feel that you have a choice in life or no choice at all?
Do you find yourself daydreaming?	Do you believe it is important to develop a balance between work and home?	Do you believe that people are essentially trustworthy?	Do you generally feel apprehensive or confident?	Do you feel you have control over what happens to you?
Do you monitor/analyse things you have done?	Do you find yourself worrying about personal matters whilst at work?	Do you find it easy to keep a secret/confidence?	Do you feel apprehensive when you are the centre of attention?	To what extent do you believe luck contributes to your success?
Do you monitor/analyse the actions and words of others?	When you are at work, do you wish you weren't?	Do you think moral and ethical standards should be upheld?	Do you meet difficult situations head on or try to avoid them?	Do you believe you can change the way you are?
Are you always clear as to why you did something or are you often surprised with yourself?	How important do you believe it is to be alone?	Do you believe you have to tell lies to succeed?	Does putting forward an unpopular view worry you?	Do you feel in control?
Do you find it difficult to attend to more than one thing at a time?	Does your personal life adversely affect your work life?	Do you feel that adherence to moral and ethical standards will inhibit your professional development?	Does the fear of rejection stop you from doing things you want to do?	To what extent do you take charge of your life?
When told someone's name do you forget it instantly?	When you are at work, is your mind on other things?	Would you rather consider doing something immoral and unethical if you could see a successful outcome?	Is there a fearful feeling at the back of your mind?	Do you have feelings of guilt about things you have said and done?
Do you have to read something more than once to fully take it in?	When you are away from people you care about, do you miss them?	Do you think honesty is the best policy?	Do feelings of insecurity make you feel fearful?	Are you able to control any angry feelings you might have?
How often do you bump into things?	Do you feel that your home life should take precedence over your work life?	Do you think it is possible to be ethical, moral and successful?	Do fearful feelings stop you from doing things you want to do?	Do you take responsibility for what happens to you?
How often do you forget appointments?	Do you think that work should take precedence over your home life?	Do you feel there is a fuzzy line between right and wrong?	Does entering new situations and meeting new people worry you?	Do you believe that being in the right place at the right time is luck?

3.3 Results

3.3.1 Descriptive Statistics and Reliabilities

3.3.1.1 Pro-environmental indicators

The alpha coefficients, means, standard deviations, skewness, kurtosis and other descriptive statistics for the scales that measure aspects of pro-environmental activity in Study 1 and Study 2 are shown in Table 3.6 and Table 3.7, respectively. Overall, the alpha coefficients were highly satisfactory, ranging from .69 to .97 (M = .89). In particular, the alpha coefficients for the newly developed cognitive environmental beliefs, pro-environmental behaviour, and willingness to change scales were commendable. These results indicate substantial internal consistency of the scales. The scales also had acceptable levels of skewness and kurtosis, suggesting no serious deviations from a normal distribution.

Scores on the cognitive environmental beliefs scale were moderate indicating that respondents believed that many of the activities are important for protecting the environment. The empirical scores distributed well across the theoretical scale (min. = 0; max. = 100). The comparison of the current and past cognitive environmental beliefs scores shows that cognitive environmental beliefs are stronger now compared with 2-years' ago (*paired samples* $t(237) = 20.70$, $p < .01$, $d = .45$).

The home pro-environmental behaviour scores show that, on average, respondents perform some but not all of the pro-environmental activities. The mean was situated just above the halfway position on the scale. Overall, the empirical scores distributed well across the theoretical scale (min. = 0; max. = 100). Respondents performed more pro-environmental behaviours at home now compared with 2-years' ago (*paired samples* $t(237) = 19.80$, $p < .01$, $d = .43$).

The work pro-environmental behaviour scores distributed to the upper- but not lower-end of the theoretical distribution (min. = 0; max. = 100). The minimum score suggests that there were some respondents who did not act pro-environmentally at work. Respondents performed more work pro-environmental behaviours now compared with 2-years' ago (*paired samples* $t(237) = 11.49$, $p < .01$, $d = .18$).

Respondents reported a higher mean score for work behaviours compared with home behaviours in both Study 1 and 2. In line with the hypotheses, further analysis was conducted

to assess the magnitude and significance of the differences between the pro-environmental thinking and behaviour scales across contexts (see section 3.3.4).

There was a moderate level of willingness to change behaviour in order to protect the environment. The empirical data did not distribute to the upper or lower ends of the theoretical scale suggesting that respondents were neither very unwilling nor very willing to change their behaviour. It appears that there are limits to the extent that people are willing to change.

There was also a moderate level of environmental concern in the sample. The scores distributed to the lower- but not the upper-end of the scale suggesting that no respondent in the sample had a very high level of environmental concern.

Pro-environmental orientation scores, as measured by the NEP, were moderate and distributed towards the upper-end of the scale.

Table 3.6. Study 1 – Descriptive statistics for the pro-environmental scales

				95% CI							
Scale	α	*M*	*SE*	LL	UL	*Mdn*	Min.	Max.	*SD*	Skewness	Kurtosis
Cog beliefs[a]	.95	69.10	0.71	67.71	70.49	68.00	5.00	100.00	12.73	-.30	.18
Home bvr[a]	.86	58.48	0.80	56.91	60.06	58.00	9.00	96.00	14.45	-.11	-.02
Work bvr[a]	.86	65.05	0.96	63.15	66.94	65.00	13.00	99.00	17.40	-.37	-.25
P cog beliefs[b]	.95	58.57	0.83	56.94	60.20	58.00	18.00	100.00	12.74	.38	.74
P home bvr[b]	.90	47.50	1.04	45.44	49.55	46.00	9.00	91.00	16.08	.29	-.16
P work bvr[b]	.89	59.10	1.16	56.82	61.38	59.00	13.00	98.00	17.84	-.04	-.40
Willingness[b]	.95	59.44	0.69	58.08	60.80	58.00	23.00	80.00	10.63	-.17	.00
Concern[b]	.90	55.51	0.89	53.75	57.27	56.00	4.00	80.00	13.78	-.46	.33
NEP[c]	.69	51.61	0.75	50.12	53.11	51.00	35.00	69.00	7.02	.37	-.20

Note. Cog beliefs = cognitive environmental beliefs; home bvr = home pro-environmental behaviour; work bvr = work pro-environmental behaviour; P cog beliefs = past cognitive beliefs; P home bvr = past home pro-environmental behaviour; P work bvr = past work pro-environmental behaviour; Willingness = willingness to change; Concern = environmental concern; NEP = New Ecological Paradigm.

LL = lower limit for 95% Confidence Interval; UL = upper limit for 95% Confidence Interval.

[a] $N = 325$. [b] $n = 238$. [c] $n = 87$.

Table 3.7. Study 2 – Descriptive statistics for the pro-environmental scales (*N* = 134)

				95% CI							
Scale	α	*M*	*SE*	LL	UL	*Mdn*	Min.	Max.	*SD*	Skewness	Kurtosis
Cog beliefs	.97	66.10	1.50	63.13	69.08	67.50	9.00	100.00	17.43	-.73	1.12
Home bvr	.91	53.63	1.38	50.93	56.39	54.07	8.89	92.59	15.97	-.19	-.24
Work bvr	.92	57.13	1.68	53.79	60.46	59.17	9.17	91.67	19.51	-.39	-.64

Note. Cog beliefs = cognitive beliefs; Home bvr = home pro-environmental behaviour; work bvr = work pro-environmental behaviour.

LL = lower limit for 95% Confidence Interval; UL = upper limit for 95% Confidence Interval.

3.3.1.2 FIT Profiler

The alpha coefficients, means, standard deviations, skewness and kurtosis values for the FIT Profiler scales are displayed in Table 3.8 and Table 3.9, for Study 1 and Study 2, respectively. Overall, the scales had acceptable levels of skewness and kurtosis, suggesting no serious deviations from normality. In Study 2 the Behavioural Flexibility scores showed a degree of deviation from normality regarding both skewness and kurtosis. These deviations were considered in the inferential analyses.

In Study 1, alpha coefficients were calculated for scales composed of more than 2 items. The alpha coefficients for these scales were, in the main satisfactory, ranging from .42 to .89 (*M* = .75) in Study 1, and .42 to .92 (*M* = .70) in Study 2. The alpha coefficient for the shortened FIT Integrity scale used in Study 1 was low. However, this may well be expected when investigating psychological constructs (see Burch, Pavelis & Port, 2008; Zibarras, Port & Woods, 2008), especially when they are measured using a limited number of items (Rust & Golombok, 1999). As this scale was a reduced version of the full FIT Integrity scale, which usually contains 50 items, and is composed of items measuring different thinking dimensions, a lower alpha coefficient is not unexpected and should not be considered too concerning. It is noticeably better in Study 2 when the full version of the FIT Integrity scale is used.

In both studies, the Behavioural Flexibility scores were situated towards the lower end of the theoretical distribution (min = 0; max. = 100). The maximum scores were 69 and 67 in Study 1 and Study 2, respectively.

The FIT Integrity scores were moderate and distributed well across the theoretical scale (min. = 0; max. = 100). The scores did not reach the upper- or lower-ends of the scale suggesting that no individuals had very poor or very high levels of FIT Integrity. The individual Constancy scores were moderate and showed a similar pattern of results in both studies. Respondents

reported lower levels of Balance and Fearlessness compared with the other Constancies. The standard deviations for the Constancies were similar, indicating that there were equal variations for each. Overall, the Constancy scores distributed well across the theoretical scales (min. = 0; max. = 10).

The Anxiety and Depression scores were moderate and distributed to the theoretical minimum and maximum scores (4-16, respectively). The average Anxiety score was slightly higher than the Depression score; the data suggest that the sample was both mildly anxious and mildly depressed.

The alpha coefficients and descriptive statistics have, in the main, confirmed the data suitable for parametric inferential analyses. One noteworthy finding identified from the descriptive statistics, and of particular interest here, is the difference between the average pro-environmental thinking and behaviour scores. The magnitude and significance of these differences were explored (see section 3.3.4).

Table 3.8. Study 1 – Descriptive statistics for the FIT Profiler scales

				95% CI							
Scale	α	*M*	*SE*	LL	UL	*Mdn*	Min.	Max.	*SD*	Skewness	Kurtosis
Integrity[a]	.42	56.19	.82	54.56	57.82	56.00	16.00	98.00	14.92	.01	-.31
Awareness[a]	-	6.18	.14	5.90	6.47	7.00	0.00	10.00	2.57	-.37	-1.07
Balance[a]	-	4.30	.15	4.01	4.59	4.00	0.00	10.00	2.65	.26	-.95
Conscience[a]	-	6.89	.18	6.53	7.25	8.00	0.00	10.00	3.30	-.81	-.73
Fearlessness[a]	-	4.54	.15	4.24	4.84	4.00	0.00	10.00	2.71	.29	-.90
S-Responsibility[a]	-	6.09	.12	5.85	6.33	6.00	0.00	10.00	2.17	-.40	-.56
B-Flex[a]	.89	19.92	.80	18.37	21.48	17.67	1.00	69.00	14.23	.86	.47
Anxiety[b]	.85	9.83	.35	9.13	10.53	10.00	4.00	16.00	3.26	.20	-.80
Depression[b]	.85	8.75	.36	8.03	9.47	8.00	4.00	16.00	3.34	.33	-.84

Note. S-Responsibility = Self-responsibility; B-Flex = Behavioural Flexibility.

LL = lower limit for 95% Confidence Interval; UL = upper limit for 95% Confidence Interval.

[a] $N = 325$. [b] $N = 87$.

Table 3.9. Study 2 – Descriptive statistics for the FIT Profiler scales (*N* = 134)

Scale	α	*M*	*SE*	95% CI LL	95% CI UL	*Mdn*	Min.	Max.	*SD*	Skewness	Kurtosis
Integrity	.85	55.27	0.77	53.73	56.80	53.90	28.00	81.00	8.97	.43	.72
Awareness	.42	5.73	0.09	5.56	5.92	5.70	3.00	9.00	1.06	.47	.41
Balance	.48	5.09	0.09	4.91	5.27	5.00	3.00	9.00	1.06	.68	.87
Conscience	.76	6.11	0.14	5.83	6.39	6.10	1.00	10.00	1.65	-.20	.22
Fearlessness	.82	4.49	0.15	4.20	4.80	4.50	0.00	10.00	1.77	.35	.26
S-responsibility	.67	6.20	0.10	5.99	6.41	6.15	2.00	10.00	1.22	-.11	1.56
B-Flex	.92	14.94	1.34	12.28	17.59	10.33	1.00	67.00	15.54	1.28	1.07
Anxiety	.53	9.28	0.24	8.82	9.76	9.00	4.00	16.00	2.75	.24	-.43
Depression	.82	8.32	0.28	7.77	8.88	8.00	4.00	16.00	3.25	.49	-.43

Note. S-responsibility = Self-responsibility; B-Flex = Behavioural Flexibility.

LL = lower limit for 95% Confidence Interval; UL = upper limit for 95% Confidence Interval.

3.3.2 Intercorrelations

The correlation matrices for Study 1 and Study 2 are shown in Table 3.10. Pearson's and Spearman's correlations were used, the latter for Behavioural Flexibility scores in Study 2 as these showed some deviations from a normal distribution (see Table 3.9).

3.3.2.1 Pro-environmental activity

In Study 1 and Study 2, the relationships between the pro-environmental scales (cognitive environmental beliefs, home behaviour, work behaviour, concern, willingness to change and NEP) were positive, moderate-to-strong in strength, and statistically significant. However, they were not too powerful, which suggests independence between the scales. The cognitive environmental beliefs and behaviour scales also correlated with the NEP scale, which was used as a criterion measure.

The relationship between cognitive environmental beliefs and behaviour differed according to context. A larger proportion of variance was explained by cognitive environmental beliefs for home pro-environmental behaviour compared with work pro-environmental behaviour (Study 1: 52% vs. 30%; Study 2: 30% vs. 16%). A William's t-test for non-independent correlations was used to compare the difference in strength for each correlation. For Study 1, the result was statistically significant, $t_{obt}(323) = 5.83$, $p < .05$, two-tailed, and suggests that there is stronger relationship between cognitive environmental beliefs and home behaviour compared with

work behaviour. However, the same analysis for Study 2 was not statistically significant ($t_{obt}(133) = 1.29$, $p > .05$, one-tailed).

The relationship between home and work pro-environmental behaviour was also statistically significant in both Study 1 and 2 (explained variance = 52% & 18%, respectively). This suggests that there is a degree of shared variance, or spillover, in pro-environmental behaviour between contexts, but still a large proportion of variance that is unexplained and attributable to other factors.

In Study 1, the relationship between environmental concern and pro-environmental behaviour also differed according to context. A William's t-test showed that the relationship was significantly stronger between environmental concern and home pro-environmental behaviour compared with work pro-environmental behaviour, $t_{obt}(323) = 3.73$, $p < .05$. The difference in the amount of explained variance was nearly 20% (37% vs. 18%).

3.3.2.2 FITness and pro-environmental activity

In Study 1, the relationships between FIT Integrity and the cognitive environmental beliefs, home and work pro-environmental behaviour were positive, statistically significant, and weak. They explained a small proportion of the variance (4.4%; 3.2%; and 4.4% for cognitive environmental beliefs, and home and work behaviour, respectively). Overall, they suggest that individuals with higher levels of FIT Integrity are more pro-environmental in their approach both at home and work.

Further analysis of each Constancy showed that Awareness was positively related to cognitive environmental beliefs but not performance of behaviour. Balance was positively related to pro-environmental behaviours performed at home. Conscience was positively correlated with all three pro-environmental indicators. Fearlessness was positively related to performance of pro-environmental behaviour at home, and Self-responsibility was related to cognitive environmental beliefs (see Table 3.10).

The results of Study 2 confirmed these relationships using the full version of the FIT Profiler. FIT Integrity was related to cognitive environmental beliefs, and home and work pro-environmental behaviour. The correlations were moderate, positive and significant at $p < .01$ and thus suggest that respondents who have higher levels of FIT Integrity lead more environmentally sustainable lifestyles. The amount of explained variance was 6.3%; 9.6%; and 5.8%, for cognitive environmental beliefs and home and work pro-environmental behaviour, respectively.

In Study 2, it was the Conscience, Balance and Self-responsibility Constancies that had significant relationships with pro-environmental activity, although these were not always consistent across the different scales. Balance was significantly correlated with performance of pro-environmental behaviours at work whereas Self-responsibility was significantly related to performance of pro-environmental behaviours at home. These results partially oppose those found in Study 1. Again, Conscience related to all three measures of pro-environmental activity (see Table 3.10). These relationships were stronger than those found in Study 1, possibly due to the full versions of the Cognitive Constancy scales being used.

There were no relationships between Behavioural Flexibility and cognitive environmental beliefs and work behaviour indices in either Study 1 or 2. There was also no relationship between Behavioural Flexibility and home pro-environmental behaviour in Study 1 although Study 2 showed a positive, moderate, and statistically significant relationship between these variables.

Both Anxiety and Depression were related to performance of pro-environmental behaviours but not cognitive environmental beliefs. In Study 1, Anxiety and Depression both had weak negative relationships with home and work pro-environmental behaviours. In Study 2, Anxiety was related to performance of pro-environmental behaviours at home whereas Depression was related to the performance of pro-environmental behaviours at work. Both of these relationships were weak and statistically significant at $p < .05$.

In Study 1, the relationship between FIT Integrity and environmental concern was positive and weak but there was no relationship between FIT Integrity and affective environmental beliefs, as measured by the NEP. There were also no relationships between Behavioural Flexibility and environmental concern and NEP, Anxiety and Depression, and affective environmental beliefs (as measured by NEP). The individual Constancies showed some relationships; Awareness, Conscience, and Self-responsibility had weak and positive relationships with environmental concern but no relationships with affective environmental beliefs, as measured by the NEP.

As well as establishing the relationships between FIT variables and current pro-environmental activities, it is also important to establish the connection with willingness to change, as this might indicate propensity to change behaviour in the future. In Study 1, the relationships between FIT Integrity, Behavioural Flexibility, and willingness to change behaviour were not statistically significant, and this pattern was also reflected by the relationships for each

individual Constancy. Awareness was the only exception and had a weak positive relationship with willingness to change behaviour.

Table 3.10. Study 1 and 2 – Intercorrelations amongst the variables

Scale	Study	1.	2.	3.	4.	5.	6.
1. Cog. beliefs	1 [a]	-					
	2						
2. Home behaviour	1 [a]	.72**	-				
	2	.55**					
3. Work behaviour	1 [a]	.55**	.72**	-			
	2	.40**	.42**				
4. Willingness to change	1 [b]	.79**	.76**	.61**	-		
	2						
5. Environmental concern	1 [b]	.64**	.61**	.42**	.63**	-	-
	2						
6. NEP	1 [c]	.36**	.32**	.30**	-	-	-
	2						
7. Integrity	1 [a]	.21**	.18*	.21**	.10	.21**	-.04
	2	.25**	.31**	.24**	-	-	-
8. Awareness	1 [a]	.16**	.09	.07	.16*	.13*	-.02
	2	.12	.12	.10	-	-	-
9. Balance	1 [a]	.08	.11*	.09	-.06	.02	.05
	2	.09	.13	.26**	-	-	-
10. Conscience	1 [a]	.20**	.14*	.19**	.10	.20**	.01
	2	.38**	.44**	.24**	-	-	-
11. Fearlessness	1 [a]	.03	.12*	.10	.05	.07	-.09
	2	.10	.12	.09	-	-	-
12. Self-responsibility	1 [a]	.11*	.06	.08	.02	.13*	-.07
	2	.08	.17*	.11	-	-	-
13. B-Flex	1 [a]	.05	.01	.01	.01	-.02	.16
	2	.05†	.24**†	-.06†	-	-	-
14. Anxiety	1 [a]	-.14	-.23*	-.23*	-	-	.10
	2	-.05	.17*	-.12	-	-	-
15. Depression	1 [a]	-.16	-.25*	-.29**	-	-	.07
	2	-.15	.09	-.16*	-	-	-

Note. Cog. Beliefs = cognitive beliefs. † = Spearman's correlation. Study 2, *N*=134.

[a] *N* = 325. [b] *N* = 238. [c] *N* = 87.

*$p < .05$. **$p < .01$.

There was a positive and strong relationship between environmental concern and willingness to change behaviour and this explained 40% of the variance (see Table 3.10). Individuals with stronger environmental concern were more willing to change their behaviour, or vice versa.

3.3.3 Mediating Effects

3.3.3.1 Cognitive environmental beliefs

In Study 1 and Study 2, the relationships between FIT Integrity and pro-environmental behaviour performed at home and work were positive, weak-to-moderate and statistically significant. The relationships between cognitive environmental beliefs and behaviour were strong and positive. Regression analysis following the four-stage process of Baron and Kenny (1986) was used to investigate the hypothesis that the relationship between FIT Integrity and pro-environmental behaviour was mediated by cognitive environmental beliefs. This analysis was conducted separately for pro-environmental behaviour performed at home and work.

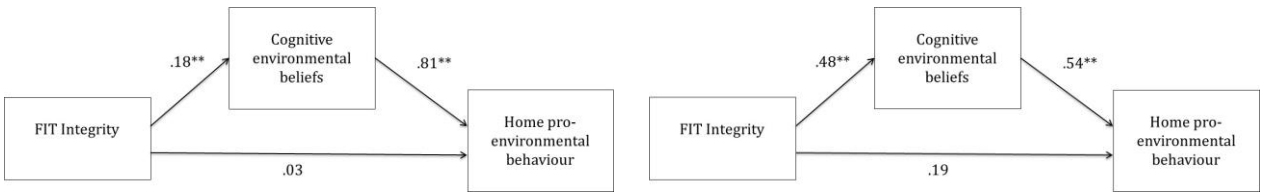
For pro-environmental behaviour performed at home, the results indicated that cognitive pro-environmental beliefs fully mediated the relationship between FIT Integrity and home pro-environmental behaviour. This result was evident in both Study 1 and Study 2. In Study 1, the results indicated that FIT Integrity was a significant predictor of cognitive pro-environmental beliefs, b = 0.18, SE = 0.05, p < .01, and that cognitive environmental beliefs was a significant predictor of home pro-environmental behaviour, b = 0.81, SE = 0.04, p <. 01. These results support the meditational hypothesis. FIT Integrity was no longer a significant predictor of home pro-environmental behaviour after controlling for the mediator, cognitive environmental beliefs, b = 0.03, SE = 0.04, p = .37, Sobel = 3.54, SE = 0.04, p < .01, consistent with full mediation.

A similar pattern of results was evident in Study 2. Again, FIT Integrity was a significant predictor of cognitive environmental beliefs, b = 0.44, SE = 0.15, p < .01, and cognitive environmental beliefs was a significant predictor of home pro-environmental behaviour, b = 0.54, SE = 0.06, p < .01. FIT Integrity was no longer a significant predictor of home pro-environmental behaviour after controlling for the mediator, cognitive environmental beliefs, b = 0.19, SE = 0.13, p = .14, Sobel = 2.77, SE = 0.09, p < .01, consistent with full mediation (see Figure 3.1).

For pro-environmental behaviour performed at work, the results indicated that cognitive environmental beliefs partially (Study 1) and fully (Study 2) mediate the relationship between FIT Integrity and work pro-environmental behaviour. In Study 1, the results indicated that FIT Integrity was a significant predictor of cognitive environmental beliefs, b = 0.18, SE = 0.05, p <

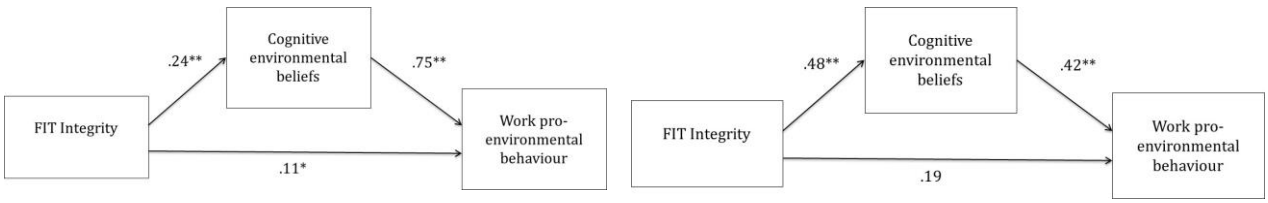
.01, and that cognitive environmental beliefs was a significant predictor of work pro-environmental behaviour, b = 0.75, SE = 0.06, p <. 01. These results support the meditational hypothesis. FIT Integrity was a weaker predictor of work pro-environmental behaviour after controlling for the mediator, cognitive environmental beliefs, b = 0.11, SE = 0.05, p = .04, Sobel = 4.46, SE = 0.04, p < .01, consistent with partial mediation.

A similar pattern of results was evident in Study 2 but this time, cognitive environmental beliefs fully mediated the relationship. FIT Integrity was a significant predictor of cognitive environmental beliefs, b = 0.48, SE = 0.16, p = .004, and cognitive environmental beliefs was a significant predictor of work pro-environmental behaviour, b = 0.42, SE = 0.09, p < .01. FIT Integrity was no longer a significant predictor of work pro-environmental behaviour after controlling for the mediator, cognitive environmental beliefs, b = 0.19, SE = 0.18, p = .31, Sobel = 2.47, SE = 0.07, p = .01, consistent with full mediation (see Figure 3.2).



*p < .05. **p < .01

Figure 3.1. Study 1 and Study 2 - Path diagrams showing the relationship between FIT Integrity, cognitive environmental beliefs, and home pro-environmental behaviour for Study 1 (left panel) and Study 2 (right panel)



*p < .05. **p < .01

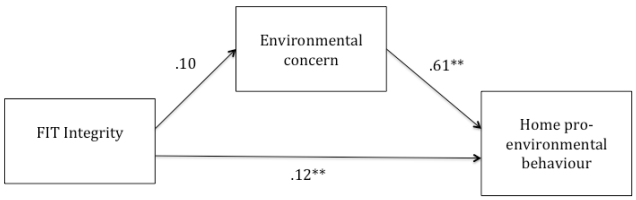
Figure 3.2. Study 1 and Study 2 - Path diagrams showing the relationship between FIT Integrity, cognitive environmental beliefs and work pro-environmental behaviour for Study 1 (left panel) and Study 2 (right panel)

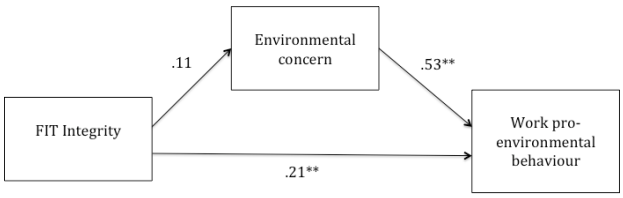
These results suggest that the relationships between FIT Integrity and pro-environmental behaviour are, to a large extent, dependent on strength of cognitive environmental beliefs. They also suggest that to leverage change in behaviour it might also be necessary to change the way

a person thinks about environmental sustainability. These results support the previous discussion and suggest that pro-environmental activity is both a psychological and behavioural problem.

3.3.3.2 Environmental concern

Regression analysis following the four-stage process of Baron and Kenny (1986) was also used to investigate the hypothesis that the relationship between FIT Integrity and pro-environmental behaviour was mediated by environmental concern. For pro-environmental behaviour performed at home, the results indicated that environmental concern did not mediate the relationship between FIT Integrity and home pro-environmental behaviour. FIT Integrity was not a significant predictor of environmental concern, b = 0.10, SE = 0.06, p = .11, and therefore remained a significant predictor of home pro-environmental behaviour after controlling for environmental concern, b = 0.12, SE = 0.05, p = .01. A similar pattern of results was also evident for work pro-environmental behaviour. FIT Integrity remained a significant predictor of work pro-environmental behaviour after controlling for environmental concern, b = 0.21, SE = 0.07, p = .002 (see Figure 3.3 and Figure 3.4, respectively).





*p < .05. **p < .01

Figure 3.3. Study 1 - A path diagram showing the relationship between FIT Integrity, environmental concern and home pro-environmental behaviour

Figure 3.4. Study 1 - A path diagram showing the relationship between FIT Integrity, environmental concern and work pro-environmental behaviour

In summary, it seems that what a person believes generally about environmental activity has a greater bearing on their behaviour compared with their specific affective beliefs.

3.3.4 Variability in Pro-environmental Activity

3.3.4.1 Differences between cognitive environmental beliefs and behaviour

The descriptive statistics displayed in Table 3.6 and Table 3.7 show noticeable differences between the cognitive environmental beliefs, and home and work pro-environmental

behaviour scores. Likewise, the intercorrelations presented in Table 3.10 show the strength of the relationships between FIT and pro-environmental behaviour differs according to context. In combination, they suggest that there are differences in pro-environmental activity levels according to context. Further analysis of these differences follows.

The aforementioned results are based on the total scores for the cognitive environmental beliefs, and home and work pro-environmental behaviour scales. The fact that these results are based on the total scores for each scale, with each scale containing a different number of items, offers the possibility that the differences observed are attributable to the content differences of the scales rather than true differences in beliefs and behaviour.

There are two potential problems with these comparisons that should be considered, even though the total scores have been transformed to percentage scales for convenience. The cognitive environmental beliefs scale contains ten items that measure very general beliefs about pro-environmental activity. These are not tied to specific actions and cannot be measured directly in the home and work pro-environmental behaviour scales (e.g., "reducing CO_2 emissions"). Consequently, the total score for the cognitive environmental beliefs scale could be distorted by the inclusion of more general thoughts, and this limits the scale's direct comparability to the pro-environmental behaviour scales, which measure specific actionable behaviours. Secondly, the items included in the home and work pro-environmental behaviour scales were tailored according to context. This means that the item content of the scales differ and the total scores will also be affected by the content differences rather than the change in context *per se*. In order to minimise these design problems, further analysis was conducted on the scales using a reduced and identical item pool for each scale, i.e., pro-environmental behaviours/actions that are the same across all three scales.

Following a content analysis of each scale, nine items were found to be identical across all three scales (see Table 3.11). A new total score was computed for each scale based on these identical items. The total scores were transformed to percentage scales (0-100) to make them directly comparable. The descriptive statistics and alpha coefficients for each scale are presented in Table 3.12 and Table 3.13 for Study 1 and Study 2, respectively.

Table 3.11. Scale items matched across the cognitive environmental beliefs and home and work pro-environmental behaviour scales

1.	Recycling cardboard	2.	Recycling glass	3.	Turning lights off
4.	Recycling plastic	5.	Not littering	6.	Turning taps off
7.	Recycling paper	8.	Flying less	9.	Using scrap paper

The alpha coefficients of the reduced scales were satisfactory in both Study 1 and 2. They were lower than the values reported for the full scales, not surprisingly considering their reduced item pool, and in Study 1 the values for the pro-environmental behaviour scales were below the recommended benchmark of .70, although this was not the case in Study 2. However, considering the reduced number of items that these scales contain, they can be deemed acceptable and not too concerning for further analysis. The descriptive statistics show that the empirical data distributed well across the theoretical scales and indicated no grave concerns regarding the normality of the distributions.

Table 3.12. Study 1 – Descriptive statistics for the matched pro-environmental scales (*N* = 325)

				95% CI							
Scale	α	*M*	*SE*	LL	UL	*Mdn*	Min.	Max.	*SD*	Skewness	Kurtosis
Cog. beliefs	.86	76.96	.67	75.64	78.30	77.77	15.87	100.00	12.11	-.68	1.95
Home bvr	.63	69.02	.89	67.31	70.72	73.33	17.78	100.00	15.64	-.75	.39
Work bvr	.66	64.51	.99	62.56	66.46	66.66	0.00	100.00	17.83	-.67	.46

Note. Cog. beliefs = cognitive environmental beliefs; home bvr = home pro-environmental behaviour; work bvr = work pro-environmental behaviour.

LL = lower limit for 95% Confidence Interval; UL = upper limit for 95% Confidence Interval.

The descriptive statistics show that respondents reported stronger cognitive environmental beliefs compared with both home and work pro-environmental behaviour in both Study 1 and Study 2. The difference between beliefs and behaviour was larger for the comparison with a work context compared with a home context. Moreover, respondents reported performing more pro-environmental behaviours at home compared with at work. These results suggest there is a limited degree of spillover in pro-environmental activity. The larger distribution of

scores for the work pro-environmental behaviour scale is noteworthy and shows that in Study 1, at least one participant did not perform any pro-environmental behaviours at work.

Table 3.13. Study 2 – Descriptive statistics for the matched pro-environmental scales (*N* = 134)

				95% CI							
Scale	α	*M*	*SE*	LL	UL	*Mdn*	Min.	Max.	*SD*	Skewness	Kurtosis
Cog. beliefs	.89	74.07	1.39	71.32	76.82	74.60	26.98	100.00	16.12	-.69	.50
Home bvr	.84	62.62	1.59	59.47	65.77	66.66	8.89	91.11	18.45	-.60	-.24
Work bvr	.87	59.22	1.68	55.88	62.55	64.44	8.89	93.33	19.54	-.71	-.38

Note. Cog. beliefs = cognitive environmental beliefs; home bvr = home pro-environmental behaviour; work bvr = work pro-environmental behaviour.

LL = lower limit for 95% Confidence Interval; UL = upper limit for 95% Confidence Interval.

Inferential analyses by one-way repeated-measures ANOVA were used to establish the magnitude of the differences between the means separately for Study 1 and 2. These proved significant for both studies. For Study 1, $F(2, 266) = 46.19$, $p < .01$, $\eta^2_{partial} = .26$, *Power* = 1.00. Follow-up pairwise comparisons, Bonferroni adjusted for multiple testing (Bonferroni $p < .02$), suggest that the differences between the cognitive environmental beliefs and home and work behaviour scales were all statistically significant (see Table 3.14). The pattern of means suggest that belief scores were the highest and work pro-environmental behaviour scores were the lowest.

In Study 2 there was a degree of violation of the sphericity assumption as indicated by the Greenhouse-Geisser epsilon value (0.86), therefore the correct degrees of freedom were used for this analysis. The differences between the cognitive environmental beliefs and home and work pro-environmental behaviour scores (see Table 3.14) were statistically significant, $F(1.72, 560.12) = 118.38$, $p < .01$, $\eta^2_{partial} = .27$, *Power* = 1.00. Follow-up pairwise comparisons, Bonferroni adjusted for multiple testing ($p < .02$), suggest that the differences in cognitive environmental beliefs and home pro-environmental behaviour and work pro-environmental behaviour were all statistically significant, but the difference between home and work pro-environmental behaviour did not reach statistical significance.

These results suggest that there is a stronger alignment between an individual's beliefs and behaviour in a home context compared with a work context. The difference between home and work is more novel and will be explored further in this programme of research.

Table 3.14. Study 1 and Study 2 – Pairwise comparisons for pro-environmental thinking and behaviour for the matched scales

					95% CI	
Scale comparison	Study	*M* difference	*SE*	*p*	LL	UL
Cog. belief vs home behaviour	1	7.95	.66	< .01*	6.36	9.54
	2	11.45	1.42	< .01*	8.01	14.89
Cog. belief vs work behaviour	1	12.45	.94	< .01*	10.18	14.73
	2	14.85	1.78	< .01*	10.53	19.16
Cog. belief vs work behaviour	1	4.51	.83	< .01*	2.52	6.50
	2	3.40	1.64	.12	-0.57	7.37

Note. Cog. belief = cognitive environmental beliefs; home bvr = home pro-environmental behaviour; work bvr = work pro-environmental behaviour.

*p < .02 Bonferroni adjusted p-value to account for multiple comparisons.

3.3.4.2 Differences between home and work pro-environmental behaviours

The home vs. work difference in pro-environmental behaviour was explored further by decomposing each scale into its constituent behaviours that were comparable between contexts, i.e., they could be performed both at home and work. Table 3.15 and Table 3.16 present the corresponding descriptive statistics and paired samples t-tests for Study 1 and 2, respectively.

The pattern of means for Study 1 shows that respondents performed all-bar-one of the pro-environmental behaviours more frequently at home compared with at work. The exception was 'turning taps off'. The home vs. work differences were statistically significant for seven out of the nine behaviours (Bonferroni adjusted p < .005). The magnitudes of the differences varied according to the behaviour but in most cases they were moderate-to-large according to Cohen's d conventions.

Table 3.15. Study 1 – Paired-samples t-tests comparing performance of pro-environmental behaviours in home and work contexts (*N* = 325)

Scale item	Home *M* (*SD*)	Work *M* (*SD*)	*t* (*df* = 324)	*p*	*d*
Recycle plastic	3.78 (1.51)	3.51 (1.66)	2.87	.004*	.17
Recycle cardboard	3.80 (1.54)	3.61 (1.70)	2.22	.03	.12
Recycle paper	4.06 (1.34)	3.64 (1.70)	4.91	< .01*	.28
Recycle glass	3.98 (1.49)	3.33 (1.90)	7.10	< .01*	.39
Littering	1.38 (2.07)	1.30 (2.06)	1.88	.06	.04
Use scrap paper	3.52 (1.44)	3.20 (1.56)	3.11	.002*	.23
Turn taps off	3.62 (1.75)	4.80 (0.77)	11.91	< .01*	1.05
Turn lights off	4.20 (1.16)	3.65 (1.67)	5.89	< .01*	.39
Fly less	2.96 (1.50)	1.66 (2.10)	8.91	< .01*	.76

*$p < .005$ Bonferroni adjusted to account for multiple comparisons.

In Study 2 there were significant differences between home and work contexts for four out of the nine behaviours, and three of these differences remained significant when the Bonferroni adjusted p-value ($p < .005$) was used (see Table 3.16). The mean scores indicated that three out of the four behaviours were performed more frequently at home. The behaviour 'turning taps off' was the exception. This might be because work taps are automated and turn themselves off without the need for intentional action.

A comparison between the items also showed that respondents performed different pro-environmental behaviours to different extents. The noticeably lower mean scores reported for 'littering' could suggest that it is socially unacceptable generally. Overall, these results suggest that context does affect performance of pro-environmental behaviour with engagement lower at work compared with at home.

Table 3.16. Study 2 – Paired-samples t-tests comparing performance of pro-environmental behaviours in home and work contexts (*N* = 134)

Scale item	Home *M* (*SD*)	Work *M* (*SD*)	*t* (*df* = 133)	*p*	*d*
Recycle plastic	3.43 (1.50)	3.44 (1.74)	.05	.96	-
Recycle cardboard	3.56 (1.47)	3.65 (1.63)	.72	.47	-
Recycle paper	3.58 (1.46)	3.49 (1.63)	.72	.48	-
Recycle glass	3.69 (1.46)	3.39 (1.79)	2.25	.03*	0.18
Littering	0.81 (1.22)	0.66 (1.10)	1.36	.17	-
Use scrap paper	3.14 (1.61)	3.46 (1.50)	1.96	.05	-
Turn taps off	3.31 (1.70)	4.29 (1.14)	6.53	< .01**	0.67
Turn lights off	3.92 (1.29)	3.46 (1.63)	2.99	.003**	0.31
Fly less	2.73 (1.62)	0.81 (1.33)	9.31	< .01**	1.29

*p < .05, **p < .005. Bonferroni adjusted to account for multiple comparisons.

3.3.5 The Influence of FITness and Context Factors on Pro-environmental Behaviour

As shown in Table 3.10, the strength of the relationship between FIT variables and pro-environmental behaviour changed according to context (home or work). This pattern was evident for relationships with FIT Integrity and Conscience. The amount of explained variance was larger for pro-environmental actions performed at home compared with at work. This analysis explores the effect of FIT Integrity and the context factor of an environmental policy at work on pro-environmental behaviours performed at home and in the workplace. The analysis was conducted separately for Study 1 and 2 by a 2-way factorial MANOVA with 2 between-subjects factors (environmental policy and FIT Integrity group) and the home and work pro-environmental behaviour scales included as correlated dependent measures. The FIT Integrity variable was split into two groups according to the mean.

The results for Study 1 are based on a sample of 237 participants who reported on the presence of an environmental policy at work. Group descriptive statistics are presented in Table 3.17. In Study 1, preliminary assumption testing indicated that within group covariances were unequal, *Box's M* = 44.19, p < .01, indicating a violation of this assumption. The Levene's test also indicated a violation of the homogeneity of variance for the work pro-environmental behaviour scale (Levene's results were p = .45 and p = .004 for home and work scales, respectively). The MANOVA results indicated no overall interaction effect (F(1, 233) = 0.69, p = .79) but there were statistically significant main effects for both FIT Integrity and work policy (F(1, 233) = 11.67, p = .001; F(1, 233) = 11.01, p = .01, respectively). Follow-up univariate ANOVAs showed

statistically significant main effects of FIT Integrity and work policy for pro-environmental behaviours performed at home ($F(1, 233) = 5.22$, $p = .02$; $F(1, 233) = 4.45$, $p = .04$, respectively) and in the workplace ($F(1, 233) = 12.69$, $p < .01$; $F(1, 233) = 12.67$, $p < .01$, respectively). The pattern of results suggests that individuals with higher levels of FIT Integrity were more pro-environmental. The results also indicate that having an environmental policy at work has a positive effect on behaviour (see Table 3.17).

The means for FIT Integrity and work policy combined are displayed in Figure 3.5 and Figure 3.6 for home and work pro-environmental behaviour, respectively. These suggest that an environmental policy at work has the potential to further improve home and work pro-environmental behaviours regardless of levels of personal FITness.

In terms of consistency, the pattern of means shows a smaller difference between home and work contexts for individuals with higher levels of FIT Integrity compared with individuals with lower levels of FIT Integrity. The result of an independent samples t-test conducted on the mean differences between home and work pro-environmental behaviours for higher and lower FIT Integrity groups was not statistically significant, $t(236) = 1.58$, $p = .11$.

Table 3.17. Study 1 – Descriptive statistics (*M, SD*) for home and work pro-environmental behaviours (matched scales) for FIT Integrity and work policy groups (*N* = 237)

	FIT Integrity		Environmental policy	
	Low (*n* = 120)	High (*n* = 117)	Yes (*n* = 113)	No (*n* = 124)
Home behaviour	66.59 (1.26)	70.71 (1.28)	70.55 (1.30)	66.75 (1.24)
Work behaviour	58.79 (1.43)	66.04 (1.45)	66.04 (1.47)	58.80 (1.40)

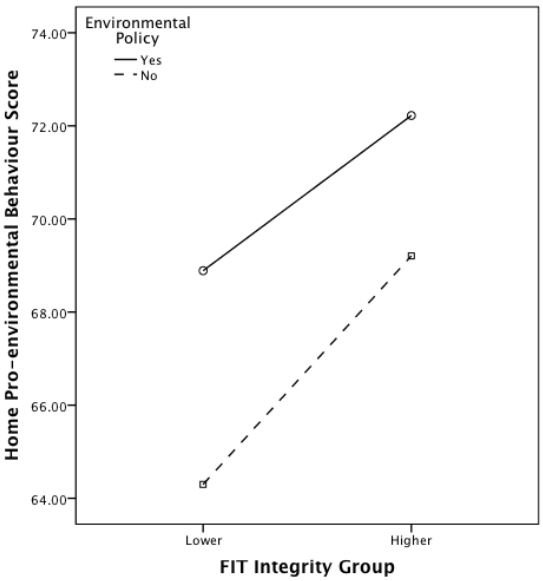


Figure 3.5. Study 1 – Mean home pro-environmental behaviour scores for FIT Integrity and work policy groups (*N* = 237)

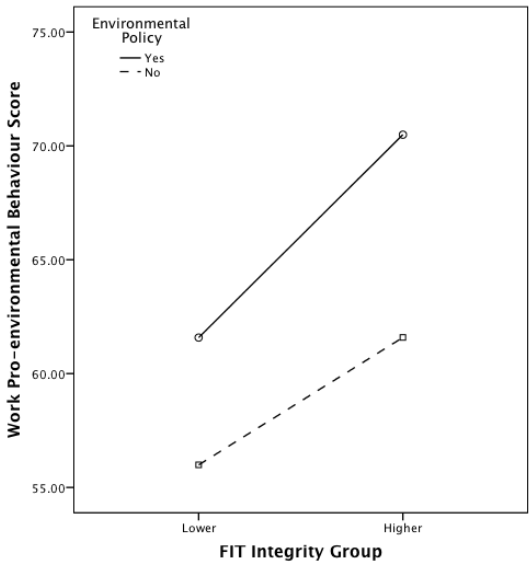


Figure 3.6. Study 1 – Mean work pro-environmental behaviour scores for FIT Integrity and work policy groups (N = 237)

The results of Study 2 are based on a sample 110 participants who reported that an environmental policy was relevant to their work situation. Group statistics are presented in Table 3.18. Preliminary assumption testing indicated that the within group covariances were unequal, *Box's M* = 24.72, $p = .005$. The Levene's tests also indicated violations of homogeneity of variance for the home and work pro-environmental behaviour scales (Levene's results were $p = .003$; $p = .01$ for home and work scales, respectively). The MANOVA results indicated an interaction effect ($F(1, 106) = 5.92$, $p = .02$) and a main effect for environmental policy ($F(1, 106) = 19.98$, $p < .01$) but no significant main effect of FIT Integrity ($F(1, 106) = 2.14$, $p = .15$). Follow-up univariate ANOVAs showed that a main effect of environmental policy was evident for both pro-environmental behaviours performed at home and work ($F(1, 50) = 10.69$, $p = .002$; $F(1, 50) = 11.33$, $p = .001$, respectively). The descriptive statistics presented in Table 3.18 show the pattern of means. They suggest that individuals with higher levels of FIT Integrity were more responsive to environmental policies in the workplace (see Figure 3.7. and Figure 3.8). This suggests that factors relating both to the individual and context are important for supporting pro-environmental behaviours.

Table 3.18. Study 2 – Descriptive statistics (*M, SD*) for home and work pro-environmental behaviours (matched scales) for FIT Integrity and work policy groups (*N* = 110)

	FIT Integrity	Environmental policy	
		Yes (*n* = 54)	No (*n* = 56)
Home behaviour	Low (*n* = 58)	60.89 (3.19)	57.17 (2.78)
	High (*n* = 52)	74.79 (2.96)	58.26 (3.33)
Work behaviour	Low (*n* =58)	64.09 (3.25)	57.10 (2.82)
	High (*n* =52)	70.65 (3.01)	50.92 (3.38)

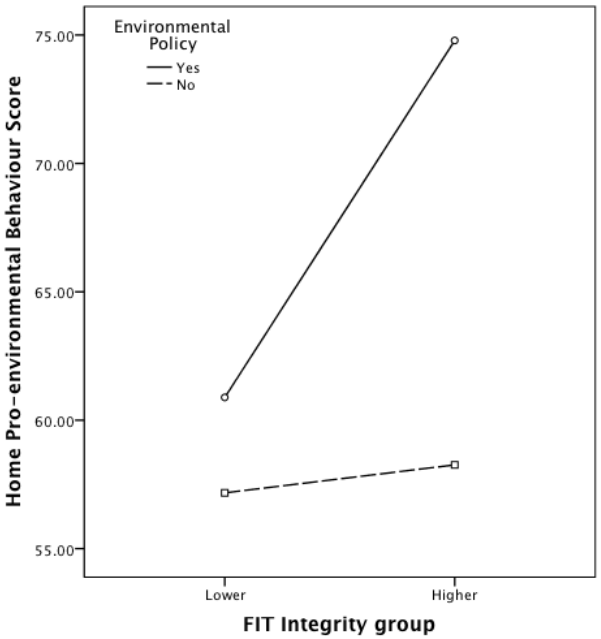


Figure 3.7. Study 2 - Mean home pro-environmental behaviour scores for FIT Integrity and work policy groups (N = 110)

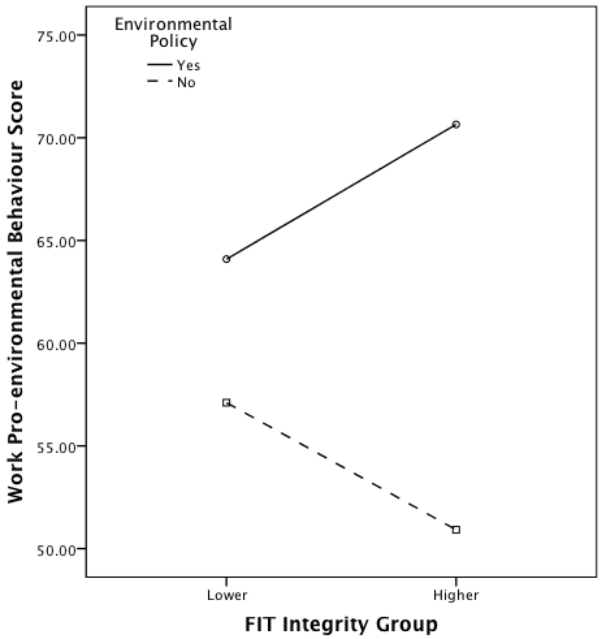


Figure 3.8. Study 2 – Mean work pro-environmental behaviour scores for FIT Integrity and work policy groups (*N* = 110)

3.4 Discussion

These studies were the first to explore empirically the relationships between FIT variables and pro-environmental activity. The FIT Framework was chosen in order to develop a better understanding of the personal characteristics that might support individuals in engaging with environmental sustainability issues both cognitively and behaviourally. The majority of empirical research that exists already has explored the FIT Framework in relation to health-related outcomes, specifically weight loss, stress, and family functioning (see Fletcher et al, 2011; Sharma, 2011). The research presented in these studies has begun to elucidate the value

of the FIT Framework in a very different and timely domain – in relation to engagement with pro-environmental activity.

3.4.1 Reviewing the Hypotheses

Study 1 and Study 2 explored six hypotheses, which will now be reviewed.

It was expected that FIT variables would relate to pro-environmental activity such that people with higher levels of FITness would be more pro-environmental in their approach overall, and specifically in relation to their pro-environmental beliefs, pro-environmental behaviour, level of environmental concern, and willingness to change. Four specific hypotheses were proposed:

> H_{1a}: People scoring higher on FIT variables (as measured by the FIT Profiler) will be more cognitively aware of environmental sustainability issues (as measured by the cognitive environmental beliefs scales).
>
> H_{1b}: People scoring higher on FIT variables (as measured by the FIT Profiler) will be more behaviourally engaged with environmental sustainability issues (as measured by the home and work pro-environmental behaviour scales).
>
> H_{1c}: People scoring higher on FIT variables (as measured by the FIT Profiler) will be more willing to change their behaviour in the direction of greater environmental sustainability (as measured by the willingness to change scale).
>
> H_{1d}: People scoring higher on FIT variables (as measured by the FIT Profiler) will be more concerned about environmental sustainability issues (as measured by the environmental concern and affective environmental belief scales).

The patterns of results in Study 1 and Study 2 suggested that personal levels of FITness (in particular, FIT Integrity) were positively related to pro-environmental activity. Specifically, there were statistically reliable relationships between the FIT Constancies and the different measures of pro-environmental beliefs, behaviour, and concern. The Conscience Constancy had the strongest and most consistent relationship with pro-environmental activity. The relationships between FIT variables and pro-environmental behaviour were mediated by an individual's beliefs about pro-environmental activity. In contrast with the cognitive dimensions of FIT, Behavioural Flexibility showed a weaker relationship and was only related to home pro-environmental behaviour. It is, however, noteworthy that the Behavioural Flexibility scores were low generally and did not extend beyond the mid-point of the scale. In addition, there was a weak relationship between FIT Integrity and environmental concern but no relationship

between FIT variables and affective environmental beliefs or willingness to change behaviour. These results partially confirm hypotheses 1_a, 1_b, and 1_d but overall, they do not support hypothesis 1_c.

It was expected that levels of pro-environmental activity would differ according to context in accordance with levels of FITness. The presence of an environmental policy at work was also expected to have a different effect on levels of pro-environmental activity according to personal FITness. Two specific hypotheses were explored:

> H_{1e}: There will be a difference in pro-environmental behaviour according to context and this will be larger for individuals with lower levels of personal FITness (as measured by the FIT Profiler).
>
> H_{1f}: The presence of an environmental policy at work will have a positive effect on pro-environmental behaviour and this will be larger for individuals with higher levels of personal FITness.

The results showed there was a degree of heterogeneity between pro-environmental thinking and behaviour, and between pro-environmental behaviour performed in home and work contexts. Participants reported stronger pro-environmental beliefs compared with pro-environmental behaviour, and performed more pro-environmental behaviours at home compared with at work. Individuals with higher levels of personal FITness were no more consistent in their performance of pro-environmental behaviours across contexts compared with individuals with lower levels of FITness. This result does not support hypothesis 1_e. Overall, it suggests that there is a limited degree of spillover across pro-environmental activity.

The presence of an environmental policy at work had a positive effect on behaviour both in the workplace and at home. In Study 2 there was also an interactive effect of environmental policy and level of personal FITness, which suggests that work policy had a larger positive effect on behaviour for those individuals with higher levels of FIT Integrity. This result supports hypothesis 1_f. Perhaps individuals with higher FITness were more aware of the work policy and how this could be used to guide behaviour or, perhaps, it gave them a licence to act in accordance with their intrinsic values. Overall, these results suggest that both intrinsic and extrinsic variables can have a significant influence on levels of pro-environmental activity.

3.4.2 FITness and Environmental Sustainability

The pattern of results suggests that personal levels of FITness relate to an individual's cognitive and behavioural engagement with environmental sustainability such that individuals with higher levels of FITness are overall more pro-environmental in their approach. The fact that the relationships between FIT Integrity and pro-environmental behaviour were, at least, partially dependent on pro-environmental beliefs, but not level of environmental concern, suggests that individuals need to be cognitively engaged and have a sufficient level of general awareness about climate change, rather than necessarily being emotionally concerned about the problem. Moreover, they need to use this awareness to identify opportunities to behave pro-environmentally. Without a sufficient level of awareness, people might be unaware both of the problems of climate change as well as of the pro-environmental options that are available to them. They might likewise be cognitively unaware of their own behaviours and the impact that these have on their personal sustainability and, therefore, do not see the ways that they could change to be more pro-environmental.

These results support the proposition that those models that seek to explain pro-environmental behaviour, and those that seek to encourage pro-environmental behaviour change, should consider both the cognitive and behavioural dimensions of environmental sustainability simultaneously and equally, rather than placing significant emphasis on one dimension at the detriment of the other. The FIT Framework does allow us to look simultaneously at the cognitive and the behavioural characteristics that might relate to pro-environmental activity, and through the proposition of the Do Something Different (DSD) intervention, also offers an approach to help people to change.

The relationships found in these preliminary studies suggest that an individual's cognitive Constancies are more influential than their degree of Behavioural Flexibility in determining current pro-environmental behaviour. Individually, all of the cognitive Constancies relate, in some way, to pro-environmental activity. This does not mean, though, that being behaviourally flexible is unimportant or that behaviour change approaches should only focus on developing people's cognitive engagement towards environmental sustainability. As well as being aware of the opportunities for change, it is also important that individuals have an adequate behavioural repertoire or range of behaviours in order to behave in accordance with perceived opportunities. These studies have only shown that Behavioural Flexibility does not correlate with established patterns of pro-environmental beliefs or behaviour. In retrospect, perhaps this

is not too surprising. It may just indicate that people behave fairly habitually, whether or not their habits are pro-environmental. Indeed, the low distribution of Behavioural Flexibility scores suggests general patterns of behaviour are fairly fixed; people are habit-bound. If this is the case more generally, then it will be important to focus interventions on enhancing the Behavioural Flexibility of the habitually "non-green", leaving the habitually "green" to continue in their largely sustainable behavioural routines.

It seems counterintuitive to disrupt the behaviour patterns of those individuals who are habitually sustainable in their approach, simply to make them more flexible. They have, after all, established patterns of behaviour that are pro-environmental. What these results are suggesting, therefore, is that a sufficient level of Behavioural Flexibility might be more important for supporting individuals to *change* behaviour to become more pro-environmental, than it is for them to be pro-environmental *per se*. This would suggest that enhancing Behavioural Flexibility will make it easier to turn non-green behaviours to green, a hypothesis that deserves further investigation. The purposeful development of Behavioural Flexibility might be a necessary pre-cursor to support individuals who are habitually non-green towards a more pro-environmental disposition and more environmentally sustainable behaviours.

Whether, in the pursuit of more environmentally sustainable behaviours, it will be necessary to target interventions at enhancing the cognitive Constancies, is an open question. Although enhanced cognitive Constancies were associated here with stronger pro-environmental beliefs and behaviour, it is just as possible that a change in behaviour can prompt a change in beliefs, and vice versa. The FIT Framework (Fletcher & Stead, 2000) emphasises the bi-directional relationship between people's cognitions/beliefs and their behaviour, and the DSD behaviour change approach associated with FIT directs development in both areas.

Based on the results of these initial studies, there is reason to believe that the FIT Framework and associated DSD approach might usefully be applied in the pro-environmental domain. The approach is, by nature, generic, and has applicability to many different behaviour types. It offers a different perspective on the personal characteristics that relate to pro-environmental activity and deliberately steers clear of some of the habits that researchers are starting themselves to develop in their efforts to come to a better understanding of pro-environmental behaviour.

3.4.3 The Heterogeneity of Pro-environmental Activity

There was a degree of heterogeneity between pro-environmental beliefs and behaviour, and between pro-environmental behaviour performed in home and work contexts. Participants reported stronger pro-environmental beliefs compared with pro-environmental behaviour, and performed more pro-environmental behaviours at home compared with at work. Put differently, there was a limited level of spillover across pro-environmental activity.

The differences observed are in line with previous research (e.g., Blake, 1999; McDonald, 2011). Indeed, the pro-environmental belief-to-behaviour differences show that beliefs do not always translate into action, and the home-to-work behaviour comparisons show that actions can be constrained significantly by the context. The former result concurs with the value-action gap (Blake, 1999) and suggests that people do not always act in the way they think, wish or believe. This 'gap' might occur because the automaticity of existing habits disconnects behaviours from intentions.

The differences shown between contexts also suggest that factors external to the individual can have a large influence on behaviour. This might be particularly evident when behaviours have become characterised by habit and are guided by cues in the context rather than intentional processes. A change in context can disrupt significantly the factors that support behaviour and prevent positive spillover. The direction of the differences between contexts found in Study 1 and Study 2 aligns with previous research (Barr, Shaw, Coles & Prillwitz, 2010; Dolnicar & Grün, 2009; Lee, De Young & Marans, 1995), and suggests that even when individuals have established good environmental practices at home, these are not always transferred into the workplace. Finding out why private behaviours are not being reproduced in a work context is an important next step for this programme of research. Following on from these results, Study 3 and Study 4 will explore the potential barriers to environmentally sustainable actions in home and work contexts, and Study 5 will elucidate specifically the role of habit for a range of pro-environmental behaviours.

The presence of an environmental policy at work had a positive effect on behaviour both in the workplace and at home. In Study 2 there was also an interactive effect of environmental policy and level of personal FITness, which suggested that work policy had a larger positive effect on behaviour for those individuals with higher levels of FIT Integrity. Perhaps a work policy provided a clear framework to guide behaviour, or gave these individuals 'permission' to act in

an environmentally sustainable way. Overall, these results suggest that both intrinsic and extrinsic variables can have a significant influence on pro-environmental activity.

Study 1 and Study 2 also explored the effect of environmental policy on home and work pro-environmental behaviour. Combined, the results showed that environmental policy can have an influence on behaviour both in the workplace and a potential spillover effect to home. These are interesting findings as they suggest that an organisational/structural characteristic, which is external to the individual, can have a strong effect on behaviour. The interaction effects with FIT Integrity also suggest that combining an environmental policy or the right structural framework with the development of FITness might be doubly effective.

This research did not focus on specific work environments (e.g., offices, university) or organisational characteristics, thus there is, undoubtedly, a large degree of uncontrolled variance in type, format, presence, and adherence of the environmental policies across workplaces. No inferences are made about any of these factors. What is noteworthy is the significance of the findings for encouraging the spillover and transference of pro-environmental behaviours across contexts, so that individuals can be encouraged to adopt and lead lifestyles that are overall more environmentally sustainable, regardless of context and extrinsic characteristics. Indeed, the role of the organisation in developing the environmental sustainability capabilities of its employees, and the compatibility between organisational and personal characteristics should also be elucidated further (see Zibarras & Coan, 2015).

3.4.4 Strengths and Limitations

These studies, as far as I am aware, are the first to elucidate the role of FIT variables in environmentally sustainable lifestyles. Indeed, other studies have suggested FIT variables might be relevant for outcomes related to other social domains such as weight loss and family functioning (Hanson, 2008; Sharma, 2011) but none have investigated how FIT variables might be relevant for outcomes that have less personal relevance for the individual. This research, therefore, expands understanding of the outcomes that relate to personal levels of FITness and more specifically, advances knowledge of how personal FIT characteristics might support individuals to develop lifestyles that are overall more environmentally sustainable.

The research reported here has highlighted several areas for further investigation, including an exploration of the factors constraining and facilitating the performance of pro-environmental behaviour in different sites of practice, specifically at home and in the workplace, and the influence of FITness and the role of habit in these different locations. The pro-environmental

scales that were developed for these empirical studies showed acceptable levels of internal reliability. This finding lends support to their wider use in future research.

These preliminary studies are, however, not without their limitations. As noted previously, the data were self-reported and included only individuals' perceptions of their environmental activities rather than objective measures. This raises potential limitations with regards to the accuracy of self-report data, particularly in relation to the performance of environmentally sustainable actions in home and work contexts. An objective measure would, of course, offer a more reliable outcome (Huffman, Van Der Werff, Henning & Watrous-Rodriguez, 2014). It is acknowledged that subjective reports of pro-environmental activity may distort the results of the study in some way (Schwarz, 1999). However, the replication of the results in two separate empirical studies, and across a total sample size of more than 450 respondents, suggests that they have at least some, if not a large, degree of validity and reliability. They justify sufficiently further explorations of the relationships between FIT variables and pro-environmental activity.

A second potential limitation relates to the sampling, in particular, the inclusion of student respondents in the sample. It was decided to include data from this participant group in the sample despite these individuals not necessarily working on a full-time basis. The reason for doing so was based on a prior assessment of their responses on the items of this scale. The scores did not indicate a systematic pattern of responding at the lower end of the scale, which if present, would indicate never performing pro-environmental behaviours in this context, and therefore present the possibility that these individuals were not employed. The self-selecting nature of completing this scale suggests that even student respondents had enough work experiences to report on pro-environmental behaviours performed in this context, even if they worked on a part-time or casual basis. The extent of employment was not of specific interest here, and there was no intention to relate pro-environmental activities to level of employment. Instead, this study was interested in the comparison between home and work contexts regardless of residential and employment positions within each of these. In this regard, these results are informative for this programme of research but their wider application to specific organisations with known characteristics may be more limited.

3.5 Conclusions

The purpose of this Chapter was to explore empirically the relationships between FIT variables and pro-environmental activity. The results of these studies suggest that in many ways, the FIT Framework might offer a useful alternative approach for understanding pro-environmental

activity. The empirical relationships between FITness and environmental sustainability suggest that developing personal FITness could help individuals become more pro-environmental in their approach both cognitively and behaviourally.

The empirical studies presented in this Chapter have started to establish the value of the FIT Framework with reference to pro-environmental activity. The results of the empirical studies will be used to adapt the generic FIT-DSD intervention towards pro-environmental activity, and to enhance the utility of the intervention for pro-environmental behaviour change. The immediate next step in this programme of research was, however, to explore further pro-environmental behaviours in home and work contexts and elucidate why a work environment is less supportive of environmentally sustainable actions, even for those individuals with higher levels of personal FITness. In relation to this, the empirical studies that follow are focused on the spillover of pro-environmental activity.

4 Exploring the Effect of Context on Pro-environmental Activity

4.1 Introduction

Following on from Chapters 1-3, the following empirical studies explored pro-environmental behaviours in home and work contexts, in order to compare the levels of pro-environmental activity in each site of practice, and identify the factors that influence behaviour. The performance of pro-environmental behaviours in household contexts has been extensively and systematically researched (Abrahamse, Steg, Vlek & Rothengatter, 2005). There has, however, been far less empirical research on pro-environmental activity in non-domestic settings, such as offices and other workplaces, particularly from the perspective of employee behaviours. To quote Ones and Dilchert (2012, p.452), "pro-environmental behaviours have been studied in both the public and private sphere, but rarely in work settings". An individual's cognitive, affective, and behavioural habits might be very different in one context compared with another. Therefore, it is necessary to conduct further research focused specially on pro-environmental behaviours performed in the workplace.

This bias in research towards a home setting might also have implications for the validity of models of pro-environmental behaviour and the utility of frameworks of behaviour change, particularly when the intent is to explain behaviours in a non-domestic setting. As the literature review in Chapter 1 highlighted, models of behaviour and behaviour change differ in their focus and emphasis on the determinants of behaviour. Many of the models are egoistic in the sense that they focus on individual and personal characteristics such as cognitions, values, and beliefs (e.g., TPB, HBM, SoC), often at the expense of social and contextual factors. These models often also assume the position of bounded-rationality and define a direct relationship between intentions and behaviour. As discussed previously, behaviour is not always guided by intention; practiced behaviours are often characterised by habit and controlled by cues in the context.

The latter of these points has not, to date, been fully accounted for in the established models of pro-environmental behaviour. This is evident by the lower presence of social and physical environment factors and of habit. Moreover, these extrinsic variables might have a stronger influence on behaviours in non-domestic settings. For example, Siero, Boon, Kok and Siero (1989) suggested that the financial cost of consumption and environmental factors such as organisational size, structure, and culture could influence an employee's motivation to conserve or consume resources. With consideration of these points, a second goal of the empirical studies that follow was to elucidate further the influence of intrinsic and extrinsic

variables (internal and external factors) on pro-environmental behaviours performed in both home and work contexts. Extrinsic variables encompass variables/factors that are external to the individual and are present in the social context (e.g., the needs, expectations or norms of other people), the physical context of the environment (e.g., the presence of controls over building systems or equipment), and the organisational context (the policies and expectations of the organisation that employs them).

In order to understand how behaviour changes according to context, the third and fourth goals of these empirical studies were to make a cross-context comparison of pro-environmental behaviour between home and work contexts, and explore how the influence of intrinsic and extrinsic factors differs between these settings. Very few studies have systematically compared pro-environmental activity across sites of practice or explored how the determinants of pro-environmental behaviour might change accordingly. This is despite there being a general growing interest in energy use in organisational settings (Zibarras & Coan, 2015; Scherbaum, Popovich & Finlinson, 2008; Matthies, Kastner, Klesse & Wagner, 2011; Lo, Peters & Kok, 2012; Murtagh, Gatersleben, Uzzell, Nati, Headley, Gluhak & Imran, 2013) and spillover of pro-environmental behaviour (Truelove, Carrico, Weber, Raimi & Vandenbergh, 2014).

The research aims of this Chapter were as follows:

- to review the literature on the determinants of pro-environmental behaviours performed in organisational settings,
- to review the empirical studies that have made a cross-context comparison of pro-environmental behaviours,
- to explore empirically levels of pro-environmental activity in home and organisational contexts and,
- to explore empirically the intrinsic and extrinsic variables that influence energy saving in home and organisational contexts and compare the strength of their influence.

4.2 Literature Review

4.2.1 The Factors that Influence Pro-environmental Behaviours Performed at Home

The literature review presented in Chapter 1 highlighted the fact that there are many existing psychological theories and models of pro-environmental behaviour and behaviour change. It also identified that many models of behaviour are egoistic in the sense that they focus on individual or personal characteristics such as cognitions, values, and beliefs, as determinants of behaviour and levers for behaviour change (e.g., TPB, HBM, SoC). Their focus on personal

characteristics is often at the expense of social or contextual factors. The intrinsic variables identified in these models have typically been defined as 'motivational' and categorised into three channels of influence: costs and benefits, morals and normative concerns, and affect (Steg & Vlek, 2009). Amongst these models there is a general underlying assumption that action results from a process of reasoned decision-making, whereby the individual is consciously aware of the need to act. This, as discussed previously, is not always the case. Due to a network of habits in thinking, behaving, and affect, individuals can be unaware of their current behaviours, of the impact that these have, of the need to change, and of the options that are available for mitigating this impact. In other words, they are unaware generally of the opportunities for change.

The established models of pro-environmental behaviour have tended to focus on private sphere behaviours: those behaviours that are performed in a personal home environment. Their validity has been tested in relation to: household recycling (Kaiser & Gutscher, 2003), waste composting (Mannetti, Pierro & Livi, 2004), purchasing behaviours (Harland, Staats & Wilke, 1999), and more predominately, travel mode choice (Bamberg & Schmidt, 2003). There has been far less research on pro-environmental behaviours performed outside of the home, in a workplace setting, for example, and none, as far as I am aware, that intentionally compares the spillover effects across contexts. For the reasons described above, established models might have much lower levels of validity for behaviour performed in non-domestic settings.

4.2.2 The Factors that Influence Pro-environmental Behaviours Performed at Work

Pro-environmental behaviours performed in an organisational setting are likely to be motivated by different factors compared with behaviours performed in and around the home. It is likely that behaviour at work will be influenced by both intrinsic motivational and personal characteristics as well as extrinsic factors in the structure of the social, physical, and organisational context (Stern, 2000). The strength of influence of these factors in an organisational setting might be different to a home environment. For example, extrinsic factors might have a larger influence on behaviour, and differ according to the pro-environmental behaviour under investigation (see Lo, van Breukelen, Peters & Kok, 2014).

In a review on the determinants of pro-environmental behaviours in organisations, Lo et al (2012) identified a range of determinant variables that had been explored in an organisational setting. These included intrinsic variables such as personal beliefs, attitudes, self-efficacy, and past behaviour, and extrinsic variables such as social norms, the involvement of superiors, the

physical context, and innovation. Across the 21 studies that were included, the largest effect sizes were found for behavioural intentions, personal norms, and past behaviour – all intrinsic variables. The only extrinsic variable to have a large effect size was the compatibility dimension of innovation. Compatibility is one of the attributes identified in the Diffusion of Innovation theory (DOI; Rogers, 2003) and is defined as the extent to which an innovation is perceived to be consistent with the pre-existing culture and infrastructure. In conclusion, Lo et al (2012) suggested that there was a large degree of heterogeneity in the determinants of pro-environmental behaviours in organisations, and this made it difficult to generalise and make firm conclusions. They also suggested that further research is needed to explore how individual characteristics interact with organisational determinants, and also how this interaction might be different in an organisational setting compared with a home setting.

Many of the variables identified in Lo et al's (2012) study were derived from the popular theoretical frameworks that have been used to conceptualise pro-environmental behaviour (see Chapter 1). Although these frameworks were originally designed to describe pro-environmental behaviours performed in personal lifestyles (e.g., a home setting), they have, erroneously perhaps, also been used to explain pro-environmental behaviour in the workplace (see Andersson, Shivarajan & Blau, 2005; Scherbaum et al, 2008; Greaves et al, 2013; Zibarras & Coan, 2015). Similarly to the previous discussion, Andersson et al (2005) suggested that these theories failed to demonstrate relevance to pro-environmental behaviours in a work setting. They concluded that pro-environmental behaviours performed at work are determined by different determinants than are pro-environmental behaviours performed at home. Furthermore, these models tend to emphasise the stable differences between people, such as their attitudes and personal norms. They do not consider within-person variability, such as fluctuations in daily affect (see Bissing-Olson, Iyer, Fielding & Zacher, 2013), and how pro-environmental behaviour might change over time, depending on the particular circumstances that an individual experiences.

In light of these findings, Paillé and Boiral (2013) explored the value of social exchange theory (see Emerson, 1976) for understanding pro-environmental activity at work. Social exchange theory has often been used to understand voluntary workplace behaviour (see Cropanzano & Mitchell, 2005). The theory suggests that "voluntary actions are motivated by the returns they are expected to bring and typically do in fact bring from others" (Blau, 1964, p.91). In other words, this perspective suggests that behaviours are consciously motivated and appraised from the perspective of rational choice. Empirical research has supported this decision framework

and found that when employees feel supported by their organisation, they become more committed and satisfied, and this encourages them to be more willing to engage in pro-environmental activity (see Paillé & Boiral, 2013; Ones, Dichert & Biga, 2010). In contrast, a psychological breach of contract can impede significantly pro-environmental activity in the workplace (see Paillé & Mejía-Morelos, 2014).

As expected, the results of these studies suggest that the popular models of pro-environmental behaviour might have lower levels of validity when explaining behaviour in an organisational context. Extrinsic factors in the social and physical environment, which are often not accounted for in established models, can have a substantial influence on employee pro-environmental behaviour. It seems that work pro-environmental behaviours are, to a certain degree, motivated by an expected reciprocal relationship between employee and employer. The strength of this relationship is likely to vary because of structural factors outside of personal control. Such changes could disrupt directly the performance of pro-environmental behaviours. Preceding this, however, it is first necessary for employees to be sufficiently aware of their employer's goals, so as to behave appropriately in accordance with these. Individuals are often not sufficiently aware of their own behaviour so it is also likely that they might lack awareness of their employer's environmental commitments and intents too, particularly if these are not exemplified explicitly by middle management (Andersson et al, 2005; Daily, Bishop & Govindarajulu, 2009; Ramus & Steger, 2000). The strength of existing habits can disconnect an individual's behaviours from both their own and their employer's pro-environmental intentions.

Overall, this section of the review has suggested that existing models of pro-environmental behaviour are likely to be less valid in an organisational setting because of the greater variability in structural factors. Future research should consider further the complex interplay of extrinsic and intrinsic variables in the workplace, paying particular attention to personal levels of awareness and existing habits, and how these differ from a domestic setting.

The next section of this review presents the empirical research that has compared the performance of pro-environmental behaviour in different contexts and considers the spillover of pro-environmental behaviour across contexts. The results of this review will help to define, in conjunction with the results of Studies 1 and 2, the hypotheses for Study 3 and Study 4. It is important to mention that none of the studies reviewed so far have explored *why* pro-environmental behaviour performed in one context might not spillover into another.

4.2.3 Comparing Pro-environmental Behaviours in Different Contexts

4.2.3.1 Home-to-holiday comparison

The majority of research that has explored performance of pro-environmental behaviours in different contexts has focused on a comparison between home and holiday environments. For example, Dolnicar and Grün (2009) found, like Study 1 and Study 2, that performance of pro-environmental behaviour shifts systematically according to context. In their comparison of a home versus holiday context, they found that pro-environmental actions are, to a certain extent, and for the majority of people, dependent on the context/environment. They initially identified six clusters of individuals within the sample as defined by their performance of pro-environmental behaviours at home. Cluster membership was then reassigned a second time based on performance of pro-environmental actions on holiday/vacation, and a comparison was made between the two.

The results revealed that regardless of original cluster membership, in most cases, respondents moved from their original cluster for the home environment to a less pro-environmental cluster for the vacation/holiday context – a negative spillover effect. This pattern of results was not true for individuals who were the most pro-environmental – these individuals had already established strong pro-environmental habits that were resistant to a change in context – nor was it true for the individuals who were the least pro-environmental. The cluster membership for the majority of these individuals (97%) remained the same across contexts, which suggests that they were consistently disengaged.

In a similar study, Barr et al (2010) also found a broadly similar pattern of results. They initially identified three clusters of participants based on their performance of pro-environmental behaviours at home. Cluster 1 represented participants who were "committed to the environmental cause at home and away" (Barr et al, 2010, p.477). These individuals had a wide repertoire of pro-environmental behaviours and were knowledgeable about carbon reduction measures (e.g., carbon offsetting), and were in favour of green taxes on air travel. They were the most pro-environmental group in the sample. Cluster 2 was the largest group with 105 members. The participants in this group showed the largest discrepancy between home and holiday behaviours. They reported to be environmentally conscious at home but they rarely transferred these behaviours on vacation. Participants in Cluster 3 performed a limited range of pro-environmental behaviours at home and only some of these transferred to a holiday

context. These individuals were the least knowledgeable and supportive of green taxes and carbon off-setting overall.

These findings, and others from similar studies (see Barr & Gilg, 2006), suggest, again, that individuals with the strongest and weakest pro-environmental habits are the most consistent across contexts. For the majority of individuals who were moderately pro-environmental, their behaviours were affected significantly by a change in context (see also Barr, Gilg and Shaw, 2011).

In summary, the research studies that have compared pro-environmental activity in home and holiday contexts suggest that physical or locational differences between the sites of practice are likely to lead to differences in the performance of pro-environmental behaviour. Individuals are overall more pro-environmental in a home context compared with on vacation, and this might be because they are able to 'design' a home environment that supports their pro-environmental activity, regardless of the strength of pro-environmental values, beliefs, and intentions. For individuals who have moderate levels of pro-environmental activity (they are not strongly engaged or disengaged), a change in context away from the home has a significant negative effect on pro-environmental activity levels.

In light of these results, it could be suggested that individuals go on holiday to intentionally take a break from daily routines. For example, Currie (1997) identified a range of 'behavioural reversals' or inversions between practices at home and those on holiday (Shaw & Williams, 2004). With this in mind, the next section explores whether a similar pattern of behaviour is found when comparing actions performed at home with those performed at work.

4.2.3.2 Home-to-work comparison

A comparison of pro-environmental activity in a home context with behaviours performed in an organisational setting might give a more informed perspective on the factors that support and constrain pro-environmental activity in day-to-day life. The greater environmental stability of these sites of practice might help to support the development of stronger habits, which have been shown to be important for behavioural spillover across contexts. Research suggests that prior experience of performing the behaviour at home is important for facilitating the same pro-environmental behaviour at work (e.g., recycling paper; Lee et al, 1995, and recycling textiles; Daneshvary, Daneshvary & Schwer, 1998).

The research that has compared performance of pro-environmental behaviours in home and work settings has provided a less consistent pattern about the direction of the differences. Both

positive and negative spillover has been observed. For example, Tudor, Barr and Gilg (2007) found that individuals were more pro-environmental at home in comparison to at work, and there was a moderate relationship across contexts (r = .40), which explained 16% of the variance. McDonald (2011) also found a home-setting bias for a range of recycling behaviours (e.g., recycling paper, card, glass, etc.). In McDonald's study, 90% of the sample recycled more materials at home compared with at work. Respondents suggested that one of the reasons why home-based recycling behaviours did not spillover to the workplace was because there were no facilities to support the behaviour in a work context. However, in Lee et al's research (1995), there were many recycling behaviours that were reported to be performed more frequently at work than at home (e.g., recycling of cardboard, newspapers/magazines). When there was a relationship between contexts, this was largely determined by environmental attitudes and beliefs.

In relation to energy consumption, Littleford, Ryley and Firth (2014) also found a mixed pattern of results in their study comparing energy-use behaviours between office and home settings. In one office-to-home comparison, they found no overall difference in pro-environmental activity between the sites of practices, and in a second comparison, they found a slight advantage for the office setting, as indicated by 60% of the behaviours being performed more frequently in this context. Moreover, there were stronger relationships between behaviours performed within the same setting compared with behaviours performed across different settings. Clusters of pro-environmental behaviours emerged according to the site of practice, the type of equipment used (e.g., lighting), and the triggers for the behaviour (leaving a room).

Overall, the results of these studies do suggest that a change from a home to work context, or vice versa, can disrupt significantly pro-environmental behaviour and prevent spillover across contexts. However, often the direction of the associated change is unclear.

4.2.4 Explaining the Differences between Home and Work Contexts

Due to changes in the physical and social structure, it seems that a change in context can have a significant impact on the performance of pro-environmental behaviour and its determinants. The established models of behaviour have not accounted sufficiently for the range of relevant variables and, therefore, they tend to have substantially lower levels of validity when explaining behaviour in a non-domestic setting (see Trumbo & O'Keefe, 2005; Lam, 2006). Research has shown that the TPB framework (Ajzen, 1991; 2014), for example, accounts for 19% of the variance in workplace pro-environmental behaviours and 48% of the variance in intentions

(Blok et al, 2014). This might be because historically, the models of behaviour have focused primarily on person-based variables such as norms, beliefs, and intentions, with their measurements derived in a home context.

To develop a better understanding of environmentally sustainable lifestyles, which assume the demonstration and commitment of pro-environmental actions *across* lifestyle practices rather than individual pro-environmental actions or behaviour sets, it is necessary to explore pro-environmental activity on a broader stage, in different contexts, and in the presence or absence of different facilitating and constraining factors. The notion of spillover from one pro-environmental behaviour to another, and from context-to-context, has often been assumed, erroneously, it seems, by researchers and policy makers alike (see Thørgersen, 1999; Thørgersen & Ölander, 2003; Daneshvary et al, 1998). There has been very little empirical research that has explored and supported behavioural fluidity across pro-environmental behaviours and between contexts. This is an opportunity for conducting further research that is addressed here. After a pilot study (Study 3) to test the basic experimental method, the second empirical study presented in this Chapter (Study 4) explored the determinants of energy saving, as one example of pro-environmental activity in home and work settings, and made a comparison of the factors that influence behaviour in each site of practice.

4.2.5 Summary of the Literature Review

Overall, the studies presented in this review suggest that a change in context can disrupt significantly patterns of pro-environmental behaviour, especially for the large majority of individuals who are moderately engaged with pro-environmental issues (see Dolniar & Grün, 2009; Barr et al, 2010). Both physical and social factors in the extrinsic environment can prevent spillover and keep home and work pro-environmental behaviours distinct (see McDonald, 2011), whereas stronger habits can increase cross-context consistency (Barr et al, 2010).

As discussed previously, many of the pro-environmental actions that are performed in a domestic setting are likely to be embedded in the relatively automatised routine of daily living (Thøgersen, 1999; Thøgersen & Örlander, 2003; Barr & Gilg, 2006; Barr, Shaw & Coles, 2011). In other words, they are likely to be established habits that are supported by the environmental context (that has been designed by the individual). In other sites of practice, such as the workplace, pro-environmental behaviours are likely to be competing with many other

priorities, and this potential conflict could prevent their frequent performance and development as habits (Unsworth, Dmitrieva & Adriasola, 2013).

4.3 Studies 3 and 4

4.3.1 Rationale

In light of the findings of the literature review, the empirical studies presented in this Chapter investigated: the performance of pro-environmental behaviours in the workplace, the spillover in environmental practices between home and work contexts, and the intrinsic and extrinsic factors that influence pro-environmental behaviours in each site of practice.

Study 3 explored the factors in the social and physical environment that influence energy saving at home both currently and as expected in the future. Study 3 was designed as a pilot study to test the methodology and respondents' understanding of the ranking task. However, due to the higher than anticipated response rate, and the results showing no grave problems with the methodology, it was included as an independent empirical study.

Study 4 elucidated further the role of intrinsic and extrinsic factors on energy saving for both a home and work environment. It sought to identify the factors that influence behaviour and their strength of influence in both sites of practice. Study 4 also examined whether the influence of intrinsic and extrinsic factors changed according to levels of personal FITness.

The inclusion of FIT was somewhat exploratory and followed on from the findings of Study 1 and Study 2. It was hoped that further exploration of the relationships between levels of personal FITness and pro-environmental activity would help to elucidate further the relationship between FIT variables and pro-environmental behaviours performed in different sites of practice, and thereby help the adaption of the generic DSD intervention to pro-environmental behaviour change.

4.4 Study 3

4.4.1 Method

Study 3 explored the social and physical context factors that influence saving energy at home. This study was designed initially as a pilot study to check respondents' understanding of the ranking task. However, given the large number of respondents who participated, it was decided that the data from this study were valuable and should be included in the main part of this programme of research. Inclusion of these data offered an opportunity to re-test the relationships and explore their validity in Study 4.

4.4.2 Objectives and Hypotheses

The objective of Study 3 was to explore the following research questions and hypotheses:

Q1. Do respondents understand the ranking task methodology?

Q2. What intrinsic and extrinsic factors influence respondents' current ability to save energy at home?

> H_{3a}: Both social and physical aspects of the context will influence respondents' energy saving at home.

Q3. What are the intrinsic and extrinsic factors that are expected to influence respondents' future ability to save energy at home? Do the factors that influence energy saving remain stable over time?

> H_{3b}: Both social and physical context factors will influence respondents' future energy saving at home.
>
> H_{3c}: The social and physical context factors that influence respondents' energy saving at home will change over time.

4.4.3 Respondents

For a pilot study, the sample size was somewhat larger than anticipated. There were N = 75 respondents, of whom n = 46 (61%) were female and n = 22 (30%) were male (7 unknown). The age distribution of respondents was skewed to the lower end with n = 43 (57%) respondents aged 18-30 years; n = 20 (27%) aged 31-50 years; and n = 5 (7%) aged 51-65 years. No respondents reported being older than 65 years. Regarding living accommodation, n = 22 (29%) respondents lived in a property they owned; n = 22 (29%) lived in a property owned by their family; n = 21 (28) lived in rented accommodation; and n = 1 (1%) respondent lived in university halls. Eleven (15%) respondents worked at a University and n = 4 (5%) respondents were students there. No other respondents were associated with this university. When asked about their awareness of an environmental policy at their place of work or study, n = 25 (33%) respondents reported they had an environmental policy; n = 15 (20%) reported that they didn't; n = 23 (31%) were unsure; and n = 5 (7%) reported 'not applicable'. Seven respondents did not report any demographic or lifestyle characteristics.

Respondents were recruited in three ways; all methods presented a brief summary of the study in a standardised form alongside the survey link. The first method recruited participants through a research participation system available to students at the University of Hertfordshire.

Respondents recruited through this method participated in partial fulfilment of the research requirements of their course. The second method recruited participants through an electronic staff newsletter at the same university. The third method recruited participants using an external research participation website hosted by an external university. This website lists online psychological research studies. The study was advertised once in the newsletter and on the research participation sites. Using these recruitment methods ensured anonymity, and minimised any influence the researcher could have on responses. All respondents were volunteers to the research and formed an opportunity sample.

Ethical approval was sought and granted from the Psychology Ethics Committee at the University of Hertfordshire prior to data collection (ethics approval code: PSY/09/09/NP/NR).

4.4.4 Materials

The data were collected using an online questionnaire composed of two sections. A detailed description of each section follows (see Appendix B).

4.4.4.1 Home energy scales

The home energy scale used in this questionnaire was a ranking scale that listed 15 items. Respondents were instructed to rank order the items according to how much it influenced their ability to save energy in a home context. Specifically, respondents were instructed to rank the item that was the most influential/important as 1, the next most important item was ranked as 2, and so on until all 15 items had been placed in order. The item perceived to be the least influential/important for saving energy was ranked lowest at rank 15. The scale was designed so that respondents could use each ranking position only once and could not have equal rankings.

The items for these scales were developed in an idiographic fashion from respondents taking part in another study (Reed & Page, 2010; Reed & Page, in press), and were elicited during personal semi-structured construct interviews, guided by Personal Construct Psychology (PCP; Bannister & Fransella, 1986) methodology. The interviews were conducted to explore the general themes around climate change and energy consumption. The interview data (or constructs, in PCP terminology) were coded and categorised into themes according to similarity, independently by two researchers. This resulted in the 15 themes that were used as the items in the home energy scale in this study. The 15 themes were each represented by one item in the home energy scale. The themes included, amongst others: feedback; belief in climate

change; belief in the need to save energy; social influence; and the price of energy (see Appendix B for a full list of items).

Respondents were presented with two versions of the home energy scale. The first scale instructed respondents to rank order the items according to how much each item influenced their ability to save energy *currently*. The second scale, which, apart from presenting the items in reverse order, was identical in content to the first, asked respondents to rank the items according to how much they anticipated the same factors would influence their ability to save energy in 2-years' time – *future* energy savings.

There were two reasons for including the second scale. Firstly, to check that respondents had understood the ranking procedure, and secondly, to get an insight about whether the social and physical context factors that influence energy saving are perceived to remain stable over time. Whilst longitudinal research is required to explore reliably the stability of contextual factors over time, this study did not employ this methodology since it was designed as a pilot study to explore the presence of relationships rather than examining the true nature of any such relationships. It was designed to give some insight into the factors that might change.

In retrospect, the scale items should have been presented in a new random order for each respondent in both versions of the scale. This, unfortunately, was not factored into the design of these scales and any problems arising from this will be addressed at the stage of data analysis.

4.4.4.2 Demographic and lifestyle questions

Demographic and lifestyle data were collected to inform the characteristics of the sample. Respondents indicated their gender, age, current accommodation, whether they were a member of staff or student at the university, and whether they were aware of an environmental policy at this institution. The latter questions were included for the purposes of another research study and were not analysed here. They have, however, been described for completeness. All of the questions were categorical and were scored numerically according to the number of categories in an ordinal or nominal way.

4.4.5 Procedure

All data were collected electronically using an online survey platform using the methods outlined above. The questionnaire contained detailed instructions, and although they were not uncomplicated, responses suggested that respondents had understood the instructions. At the

close of the survey the data were downloaded to Excel and then exported to SPSS for data preparation and analysis.

4.4.6 Data Preparation

Initial inspection of the raw data showed that 133 respondents started the questionnaire and 75 had complete entries. This equates to a 56% completion rate overall. Due to the free availability of the questionnaire on the internet, and the possibility that non-completers returned to complete the questionnaire at a later date, incomplete data sets were removed. The final sample size for this pilot study contained $N = 75$ respondents.

4.4.6.1 Exploring the presence of a response bias

Because the scale items were not presented in a new random order for each participant, a correlation analysis was conducted separately on both scales to explore the possibility of a response bias according to the order of item presentation. For scale 1 (current energy saving), the results showed that there was a positive relationship between item position and its mean item rank that was verging on statistical significance, $r(15) = .48$, $p = .07$. This pattern of response was less evident for the second scale (future energy saving), $r(15) = -.28$, $p = .31$. These patterns of responding were considered in the interpretation of the following results, and were addressed directly in the design of Study 4.

Due to the exploratory nature of this research, the analyses were conducted 2-tailed to $p < .05$, unless specified otherwise.

4.5 Results

The data collected were in the form of numerical ranks and analysed with non-parametric statistical tests. To explore respondents' understanding of the ranking task, and identify the factors that influence energy saving, a frequency analysis and median comparisons were conducted.

4.5.1 Frequency Analysis

A frequency analysis that investigated how often respondents ranked each factor at each point on the scale was conducted for two reasons: firstly, to check respondents' understanding of the task, and secondly, to identify how much influence each factor had on respondents' ability to save energy in a home context. To coincide with the third objective of this study, the frequency analysis was run on both the current and future (2-years' time) scales to enable a comparison of how the factors were perceived to change over time.

The results from the frequency analysis for the scales assessing current and future rankings are presented in Table 4.1 and Table 4.2, respectively. The data presented in these tables show, similarly to the correlation analysis, that there might be a systematic pattern in respondents' responses. However, this was not deemed strong enough to suggest that respondents had not understood the instructions of the task, which was the primary purpose of this study. If there were a total lack of understanding, the highest frequency for each item would always correspond to the same position in the scale. For example, the highest frequency for item 1 would be observed at rank 1, the highest frequency for item 2 would be observed at rank 2 and so on until all 15 items had been ranked. The data presented in both tables do show some higher frequencies across each of the diagonals but there are also some deviations to this pattern at a few points in the matrix. As pilot research, this problem was not addressed directly in Study 3, although the results are interpreted with caution, but it was addressed directly in Study 4 by randomising the item order. Overall, the pattern of data suggests that although not uncomplicated, generally respondents understood the instructions of the ranking task.

The second objective of this study was to explore the strength of influence of each item on respondents' energy saving currently and as anticipated in the future. Table 4.1 shows the rankings for current energy saving with the most frequent rank for each item shown in italics. A few key findings are evident here. First, having 'financial penalties for excessive energy consumption' was ranked as the least influential factor with 23% of respondents ranking this in the lowest position, rank 15. Second, 'Government and local authorities leading by example' was also ranked in a low position (rank 12) by 17% of the sample. At the other end of the scale, the factor with the strongest influence was 'the attitudes and behaviour of family and friends' followed by 'my sense of social responsibility'. The rankings for the factor 'feedback from my energy company showing the amount of energy used by each of my electrical appliances' were split at the upper- and lower-ends of the ranking scale.

Table 4.1. Study 3 – Frequency analysis of the ranks for each factor's perceived influence on current energy saving. The data displayed show the number of respondents who ranked each factor at each point on the scale. The highest frequency for each factor is shown in italics (*N* = 75)

	Most influential														Least influential
Scale Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Feedback from my energy company showing energy used	11	6	1	5	5	2	3	6	1	4	5	5	3	6	*12*
The attitudes and behaviour of friends and family	1	*15*	1	4	2	6	9	4	2	4	1	5	10	5	6
My sense of social responsibility	7	7	*13*	5	5	4	2	3	12	2	5	2	3	4	1
Believing that climate change is man made	7	2	6	*10*	6	3	3	4	5	6	3	7	5	2	6
Financial rewards for reducing energy consumption	4	2	6	11	*12*	5	3	5	8	3	6	3	5	0	2
My willingness to change my lifestyle	1	8	3	2	8	*12*	10	4	4	6	4	4	2	6	1
Clear and practical information on how to save energy	0	2	5	6	6	*11*	*11*	5	5	3	6	5	0	6	4
My belief that there is a need to save energy	7	4	11	6	3	5	7	*14*	4	5	1	5	2	0	1
My financial resources	*9*	5	5	5	*9*	4	3	4	*9*	5	5	4	5	1	2
Availability of grants to make property more energy efficient	3	1	1	7	4	3	2	6	8	*9*	7	3	*9*	7	5
Belief in the reality of climate change	7	6	2	2	4	7	4	6	3	7	11	*12*	6	5	3
Government and local authorities leading by example	0	1	5	3	2	0	6	2	4	4	7	*13*	10	10	8
The price of electricity and gas	7	*8*	6	3	2	2	5	6	4	5	4	6	7	7	3
Believing my actions will make a difference	7	4	5	4	5	5	5	4	3	6	6	5	4	*8*	4
Financial penalties for excessive consumption of energy	4	4	5	2	2	6	2	2	3	6	4	6	4	8	*17*

There were some similarities in the rankings for the scale measuring future energy saving (see Table 4.2). This showed that the rankings for 'financial penalties for excessive energy consumption' were bimodal: 23% of respondents ranked this factor in the lowest position, rank 15, whereas, 16% of the sample ranked it as the strongest factor. Respondents appear to be divided on how important they perceive this factor to be on future energy saving. The factor 'feedback from my energy company showing the amount of energy used by each of my electrical appliances' had its highest frequency (20%) at rank 15. 'Believing my actions will make a difference' and 'the price of electricity and gas' were ranked joint second by 21% and 16% of the sample, respectively. The distribution of ranks was less distinct for the other factors.

In summary, these results show that for energy saving at home, both intrinsic factors (e.g., motivational/attitudinal) and extrinsic factors in the context (e.g., social and physical) are considered important. In particular, the social influence from friends and family, a personal sense of social responsibility, belief in the importance of action, and the cost of energy were

identified as some of the most influential factors. The frequency analysis does suggest some difference between current and future rankings. The next step, therefore, was to consider the median and mean ranks for each factor and investigate whether these change significantly between the scales.

Table 4.2. Study 3 – Frequency analysis of the ranks for each factor's perceived influence on saving energy in 2-years' time. The data displayed show the number of respondents who ranked each factor at each point on the scale. The highest frequency for each factor is shown in italics (*N* = 75).

	Most influential														Least influential
Scale item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Feedback from my energy company showing energy used	7	5	2	2	5	3	6	3	2	3	5	4	6	7	*15*
The attitudes and behaviour of friends and family	1	7	3	6	1	7	3	5	6	6	1	4	4	*13*	8
My sense of social responsibility	7	3	11	3	5	4	5	5	5	2	2	1	*16*	4	2
Believing that climate change is man made	4	2	3	8	6	5	6	3	4	4	6	*11*	3	2	8
Financial rewards for reducing energy consumption	4	3	6	8	9	6	4	2	6	2	*12*	5	2	3	3
My willingness to change my lifestyle	2	2	6	7	5	6	4	2	5	*12*	8	5	6	5	0
Clear and practical information on how to save energy	0	1	1	9	7	7	6	*6*	*15*	11	6	1	2	2	1
My belief that there is a need to save energy	4	7	7	5	4	3	6	*21*	4	6	0	2	2	4	0
My financial resources	9	5	6	6	*7*	3	*13*	4	8	2	1	5	3	0	3
Availability of grants to make property more energy efficient	1	2	4	2	1	*16*	4	4	3	10	10	6	4	6	2
Belief in the reality of climate change	10	5	1	1	*14*	2	4	2	3	3	10	10	8	2	0
Government and local authorities leading by example	0	1	4	11	2	2	4	6	4	4	2	*12*	3	9	11
The price of electricity and gas	8	*12*	11	4	2	4	3	1	5	4	2	2	10	4	3
Believing my actions will make a difference	6	*16*	6	1	2	3	2	6	4	3	4	5	5	10	2
Financial penalties for excessive consumption of energy	12	4	4	2	5	4	5	5	1	3	6	2	1	4	*17*

4.5.2 Median and Mean Ranks

The median and mean ranks for each factor, like the frequency analysis, give an indication of the perceived strength of influence of each factor on energy saving. Numerically lower mean

and median ranks show that the factor was ranked as more important. For example, if a factor had a mean or median rank of 2 it was positioned 2nd out of 15 factors and therefore of relatively high importance and had a strong influence on energy saving. The results show that for current energy saving, 'a personal sense of social responsibility', 'belief in the need to save energy', and 'financial rewards' were believed to have the strongest influence. In contrast 'good leadership by Government and local authorities' and 'financial penalties' were ranked as the least influential. For future energy saving, 'the price of energy', and 'personal financial resources' were ranked as the most influential, and 'good leadership by Government and local authorities' plus 'feedback on energy use' were ranked as the least influential (see Table 4.3).

To coincide with the third objective of this study, inferential analyses of these differences were conducted using a Wilcoxon's signed rank test (see Table 4.3). There were three differences in the rankings that were statistically significant and one difference that was close to significance at $p < .05$ (see Table 4.3). The factors 'my sense of social responsibility' and 'believing that climate change is man-made' were ranked as having a larger influence on energy saving now compared with 2-years' time. In contrast, the factors 'the price of electricity and gas' and 'financial penalties for excessive consumption of energy' were ranked as having a larger influence in the future compared with now.

Although independently each of these differences were significant at $p < .05$, the application of a more stringent (and very conservative) p-value to account for multiple comparisons consequently makes all of these differences statistically non-significant (Bonferroni adjusted to $p < .003$). In these instances, the direction of the difference between means is of interest.

Overall, these results suggest generally that factors intrinsic to the individual are perceived to be more influential on energy saving now whereas extrinsic factors are expected to be more influential in future years.

Table 4.3. Study 3 – Descriptive and inferential statistics for each factor's perceived influence on saving energy (*N* = 75)

Scale item	Current rankings			Future rankings			*Z*	*p*
	Mdn	*M*	Overall rank	*Mdn*	*M*	Overall rank		
Feedback from my energy company showing energy used	8	8.25	12	10	9.23	14	-1.32	.18
The attitudes and behaviour of friends and family	7	8.13	11	9	9.11	13	-1.84	.07
My sense of social responsibility	6	6.45	2	7	7.67	7	-2.56	.01*
Believing that climate change is man made	8	7.67	6	9	8.48	11	-2.02	.04*
Financial rewards for reducing energy consumption	6	6.93	4	7	7.52	5	-1.20	.23
My willingness to change my lifestyle	7	7.48	5	9	8.24	10	-1.65	.10
Clear and practical information on how to save energy	7	8.01	8	9	8.00	8	-0.31	.76
My belief that there is a need to save energy	7	6.35	1	8	6.79	3	-0.94	.35
My financial resources	7	6.92	3	7	6.45	1	-1.31	.26
Availability of grants to make property more energy efficient	10	9.35	13	10	8.81	12	-1.21	.23
Belief in the reality of climate change	8	8.08	10	8	7.63	6	-1.34	.18
Government and local authorities leading by example	12	10.61	15	10	9.71	15	-1.86	.06
The price of electricity and gas	8	7.92	7	6	6.75	2	-1.94	.05
Believing my actions will make a difference	8	8.07	9	8	7.40	4	-0.98	.32
Financial penalties for excessive consumption of energy	11	9.77	14	8	8.23	9	-2.49	.01*

*$p < .05$. †$p < .003$ (Bonferroni adjusted alpha level).

4.6 Discussion

The primary aim of Study 3 was to test respondents' understanding of the ranking task used to measure the influence of intrinsic and extrinsic factors on energy saving in a home context.

However, as a result of the larger than expected sample size, two further objectives were set post data collection. The first objective was to consider the perceived extent of influence of intrinsic and extrinsic factors on current energy saving at home. The second objective was to consider the perceived anticipated influence of each factor on future energy saving at home. A comparison was made between the two sets of rankings.

It was found that although there was a degree of bias in the way respondents completed the scales, this was not deemed too strong to suggest that they had not understood the instructions of the task. However, in order to minimise this bias in future studies, Study 4 presented the scale items in a randomised order.

Study 3 identified the factors that are perceived to have the strongest influence on energy saving and compared the influence of these factors between the current and future scales. The results showed that there were some differences in the rankings between the two scales. For current energy saving, the factors believed to be most influential related to the intrinsic characteristics of the individual such as 'my belief there is a need to save energy' and 'my sense of social responsibility'. These were followed by factors relating to personal finance and financial incentives including 'my financial resources' and 'financial rewards for reducing energy consumption'.

At the opposite end of the spectrum, the factors perceived to have the least influence on current energy saving were generally related to external characteristics of the context rather than intrinsic characteristics of the individual. Specifically, these included the factors 'Government and local authorities leading by example', 'financial penalties for excess energy consumption', and 'availability of grants to make property more efficient'. The same three factors were perceived as having a weak influence in the future although 'Government and local authorities leading by example' became slightly more important. The factor 'feedback from my energy supplier' was ranked as less influential in the future. This is an interesting finding and has implications for the design and focus of pro-environmental behaviour change interventions. Feedback is a popular and well-supported approach for pro-environmental behaviour change (see Abrahamse et al, 2005).

4.7 Study 4

4.7.1 Method

Study 4 sought to elucidate further the internal and external factors believed to be important in influencing energy saving in home and work contexts. The study compared the perceived

relative importance of each factor to see whether its strength of influence differed according to context. Using the methodology established in Study 3, respondents ranked in order of importance the factors that they believed influence energy saving in home and work contexts. This study also explored how levels of personal FITness altered the strength of influence of the factors on energy saving. The study used both descriptive and inferential analyses to explore the following research objectives and hypotheses.

4.7.2 Objectives and Hypotheses

The objectives and hypotheses for Study 4 were as follows:

Q1. To explore and identify the strength of influence of the factors that are believed to influence respondents' energy saving at home.

Q2. To explore and identify the strength of influence of the factors that are perceived to influence respondents' energy saving at work.

Q3. To compare the strength of influence of the factors that are perceived to influence respondents' energy saving at home and in the workplace.

> H_{4a}: There will be a difference in the strength of influence of the factors that are perceived to influence respondents' energy saving at home and in the workplace.

Q4. To explore whether the strength of influence of the factors that are perceived to influence energy saving at home and in the workplace varies according to level of FITness.

> H_{4b}: It is expected that external factors will be perceived to have a stronger influence on energy saving in a home environment for individuals with lower levels of FITness.
>
> H_{4c}: It is expected that external factors will be perceived to have a stronger influence on energy saving in a work environment for individuals with lower levels of FITness.

Q5. To explore whether levels of FITness influence performance of pro-environmental behaviour in home and work contexts.

> H_{4d}: It is expected that individuals with higher levels of FIT Integrity will perform more pro-environmental behaviours in home and work contexts (see Studies 1 and 2).
>
> H_{4e}: It is expected that levels of Behavioural Flexibility will have no effect on performance of pro-environmental behaviours in home and work contexts (see Studies 1 and 2).

4.7.3 Respondents

Respondents in this study were *N* = 100 individuals (*n* = 28 (28%) males; *n* = 72 (72%) females). The frequency of each age category was skewed to the lower end of the distribution with *n* = 85 (85%) respondents aged 16-30 years; *n* = 5 (5%) respondents aged 31-50 years; and *n* = 10 (10%) respondents aged 51-65 years. Regarding work status, *n* = 24 (24%) were employed full-time; *n* = 25 (25%) worked part-time; *n* = 14 (14%) had temporary contracts; and *n* = 1 (1%) had a zero-contract (on-call). The remaining respondents (*n* = 35; 35%) reported that they were students. One respondent reported their work status as 'other'. When asked how long they had been working for their current employer, *n* = 31 (31%) respondents reported less than 1-year; *n* = 43 (43%) respondents reported 1-5-years; *n* = 4 (4%) respondents reported 6-10-years; *n* = 2 (2%) respondents reported 11-20-years; *n* = 2 (2%) respondents reported 21-30-years; and *n* = 18 (25%) respondents reported 'n/a'. The type of organisation that respondents worked for included: national corporate organisations (*n* = 14; 14%); public sector organisations (*n* = 25; 25%); independent businesses (*n* = 19; 19%); and Small to Medium sized Enterprises (SMEs; *n* = 13; 13%). Twenty-nine respondents (29%) reported 'n/a'. Of those respondents in employment, *n* = 21 (21%) worked in unskilled roles; *n* = 38 (38%) worked in partially skilled roles; *n* = 21 (21%) worked in a skilled role; and *n* = 20 (20%) respondents reported not applicable. By definition, an unskilled role required minimal training; a partially skilled role required a moderate amount of training; and a skilled role required highly specialised training. In line with this, *n* = 54 respondents (54%) were basic level employees; *n* = 8 (8%) were middle managers; *n* = 8 (8%) were supervisors; *n* = 5 (5%) were higher managers; and *n* = 22 (22%) respondents reported 'n/a'. Forty (40%) respondents reported that they worked individually at work; *n* = 41 (41%) worked in a team; and *n* = 19 (19%) respondents reported 'n/a'.

All respondents were volunteers for the research and formed an opportunity sample. They were recruited in three ways. Firstly, student respondents were recruited from a UK university via an electronic research participation system. These respondents completed the study in partial fulfilment of the research requirement of their course. Secondly, potential respondents known to the researcher (e.g., friends and family) were personally recruited via email or personal communication. Thirdly, respondents were recruited through online research forums on the web. All respondents completed the study online. The number of respondents obtained from each recruitment method is unknown.

Ethical approval was sought and granted from the Psychology Ethics Committee at The University of Hertfordshire prior to data collection (ethics approval code: PSY/01/11/SA).

4.7.4 Materials

The data were collected using an online questionnaire composed of several scales. A detailed description of each scale follows (see Appendix C).

4.7.4.1 Home and work energy scales

These scales were similar to those used in Study 3 but this time the items were presented in a random order. The home and work energy scales were both ranking scales that listed 15 items that related to factors in the social and physical context (extrinsic factors) as well as factors intrinsic to the individual. Respondents were instructed to rank order the items according to how much they think each factor influences their energy saving at home and in the workplace. Respondents ranked the factor that was most influential/important as 1, the next most influential factor was ranked as 2, and so on until all 15 items had been placed in order. Both scales were designed so that respondents could use each ranking position only once and could not have equal rankings.

The 15 items for the home scale were identical to those used in Study 3. The factors for the work scale required some adaptation to their wording in order to suit the work environment. The items in both scales were matched as closely as possible in order to ensure consistency and thereby maximise the possibility of comparison. For example, the item measuring the influence of other people was worded as "the attitudes and behaviour of my friends and family" for the home energy scale and was reworded as "the attitudes and behaviour of fellow colleagues" for the work energy scale. The items were matched as closely as possible between the scales. The final scales contained 12 matching items and 3 non-matching items.

4.7.4.2 The FIT Profiler – short form

The shortened version of the FIT Profiler (Fletcher & Stead, 2000), as developed by Page and Fletcher (2006), was used to measure the cognitive and behaviour dimensions of respondents' personal FITness. This scale was identical to the measure used in Study 1. To recap, it was composed of 20 items, 15 measuring the 'outer' dimension of FIT—Behavioural Flexibility—and 5 items measuring inner FIT or FIT Integrity—the Cognitive Constancies of Awareness, Balance, Conscience, Fearlessness, and Self-responsibility. When scored, higher scores equate to higher levels of personal FITness. The scores on the Behavioural Flexibility and FIT Integrity scales are scaled to 100 for convenience (min. = 0; max. = 100) and scores for each Cognitive

Constancy range from 0 to 10. For further information please refer to Study 1 presented in Chapter 3 (see also Appendix A).

4.7.4.3 Home and work pro-environmental behaviour scales

These scales measured how frequently respondents perform pro-environmental behaviours in home and work contexts. Both the home and work scales contained seven identical items (e.g., 'turn the lights off'), which were measured on a 4-point Likert scale scored from 1 (*never*) to 4 (*always*). There was also a fifth option for respondents to respond with 'n/a', and this was coded as -9. Total scores on the scale ranged from min. = 7 to max. = 28 with higher scores indicating greater performance of pro-environmental behaviours at home and work based on those pro-environmental behaviours that respondents performed.

4.7.4.4 Demographic and lifestyle questions

Demographic and lifestyle data were collected to inform the characteristics of the sample. These questions gathered information about respondents' home and work environments. The demographic questions asked respondents about their age, gender, and accommodation situation, e.g., whether the accommodation they lived in was rented, mortgaged etc. The lifestyle questions collected data on respondents' work environments. These included questions on: employment type; employment term; employment position; work type; team vs. individual working; and company type. Three further questions also assessed the presence of an environmental policy at work, and the degree of personal responsibility felt towards the environment when at home and work. All questions were categorical and scored according to the number of categories in a nominal or ordinal way, as appropriate.

4.7.5 Procedure

All data were collected electronically using an online survey data collection tool. Three methods of data collection were used. The study was advertised on an internal research participation system at the University of Hertfordshire and also externally on an online psychology research participation website. Both of these adverts included a summary of the study alongside a link to access the online questionnaire. Potential respondents known to the researcher were also contacted via email and asked to participate. The email included a summary of the study alongside a link to the questionnaire. All respondents volunteered to participate in the research and the data were collected anonymously. The questionnaire contained detailed instructions on how to complete each scale, and although they were not uncomplicated, responses suggest

that respondents had understood the instructions. At the close of the survey the data were downloaded to Excel and then exported to SPSS for descriptive and inferential analyses.

4.7.6 Data Preparation

Inspection of the raw data showed that 113 respondents started the questionnaire and 100 completed the majority of the scales. This equates to a very high completion rate of 88%. Due to the possibility that non-completing respondents later returned to the questionnaire and completed it a second time, data for the non-completers were removed. The results of this study are based on a total sample of $N = 100$ respondents although the exact number of responses included for each scale analysis varies according to respondent completion rates. Missing data were not included in the analyses.

The majority of missing data were reported for pro-environmental behaviours performed in a work environment. Upon inspection of the data it became apparent that those respondents who reported that they were students/not employed had often used the 'n/a' response option and only completed the work energy scale for those behaviours that were applicable. In order to not lose the data from these respondents, as they had completed many of the items on the work pro-environmental behaviour scale, it was decided to include it in these analyses. There were two logical reasons for its inclusion. Firstly, respondents had personally chosen to complete the work scale for those behaviours that were relevant. This suggests that they felt comfortable and knowledgeable enough to do so. This relates to the second point regarding the transience of the current job market. These respondents may have been in work previous to or whilst undertaking their studies. They were, therefore, completing the work energy scale in retrospect of their experiences. It is for these reasons that the data from respondents not currently employed were valued and included in these analyses.

All inferential analyses were conducted 2-tailed to $p < .05$, unless indicated otherwise.

4.8 Results

The data collected from the home and work energy scales were in the form of numerical ranks and analysed descriptively. The FIT Profiler and home and work pro-environmental behaviour data were analysed with parametric statistical tests where appropriate.

4.8.1 Frequency Analysis

A frequency analysis that investigated how often respondents ranked each factor at each point of the scale was conducted on the home and work energy scales. This was to identify whether

the factors that were perceived to influence energy saving differ between home and work contexts. The results from the frequency analysis for the home and work energy scales are presented in Table 4.4 and Table 4.5, respectively. The most frequently occurring rank is shown in italics in the respective tables.

The distribution of scores in Table 4.4 and Table 4.5 suggest that respondents understood the ranking task and were able to distinguish between the different factors in order to differentiate their influence on energy saving in home and work contexts. The pattern of results is different for home and work contexts.

The factor perceived to have the largest influence on saving energy at home was 'my financial resources' (14%), followed jointly by 'the price of electricity and gas' (12%), 'the attitudes and behaviour of friends and family' (12%), and 'my belief that there is a need to save energy' (12%). These factors represent both intrinsic and extrinsic variables. Another factor perceived to have a strong influence on home behaviour was 'my sense of social responsibility' (13%). At the other end of the scale, 'feedback from my energy company showing the amount of energy used' was ranked as the least influential factor by 15% of the sample. Similarly, 'Government and local authorities leading by example' (16%) was ranked at the lower end of the scale. The perceived influence of the remaining factors was distributed more evenly across the scale.

The frequency analysis for saving energy at work showed that 'respect of environmental policies at work' was perceived as the most influential factor with 21% of the sample ranking it as the most important factor. An individual's level of social responsibility was also perceived to have a strong influence and 14% of the sample ranked 'My sense of social responsibility' as the most important factor for energy saving at work. At the opposite end of the scale, 'reward schemes in the workplace for correctly following environmental policies' was ranked as the least important factor for 15% of the sample. 'Believing that climate change is man-made' was also ranked as less important by 19% of the sample, however, 18% of the sample also ranked this as one of the most important factors.

Table 4.4. Study 4 – Frequency analysis of the ranks for each factor's perceived influence on saving energy at home. The data displayed show the number of respondents who ranked each factor at each point on the scale. The highest frequency for each factor is shown in italics (*N* = 100)

	Most influential														Least influential
Scale item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Feedback from my energy company showing energy used	7	8	7	9	9	6	2	5	6	4	8	6	4	4	*15*
The attitudes and behaviour of friends and family	*12*	9	10	9	8	3	8	4	5	7	5	6	6	3	5
My sense of social responsibility	6	*13*	6	*13*	9	9	7	7	7	6	5	5	*2*	5	0
Believing that climate change is man made	4	3	6	8	11	5	8	6	11	3	2	7	8	3	*15*
Financial rewards for reducing energy consumption	9	5	4	*13*	3	7	7	5	9	7	*9*	4	6	6	6
My willingness to change my lifestyle	5	5	6	2	6	*14*	8	8	4	12	7	8	5	9	1
Clear and practical information on how to save energy	3	3	5	7	5	11	*12*	11	7	5	8	*12*	7	1	3
My belief that there is a need to save energy	*12*	*12*	9	7	5	4	6	10	7	6	4	7	3	4	4
My financial resources	*14*	8	10	3	10	5	5	10	3	8	8	1	6	7	2
Availability of grants to make property more energy efficient	1	5	4	4	6	*6*	4	5	9	*15*	10	9	3	12	7
Belief in the reality of climate change	2	10	4	2	8	5	7	4	7	11	5	8	6	*15*	6
Government and local authorities leading by example	1	5	3	3	7	3	7	8	4	6	11	11	11	*16*	14
The price of electricity and gas	12	*13*	12	3	5	9	8	2	7	3	9	2	*13*	1	1
Believing my actions will make a difference	9	3	7	4	9	7	6	*11*	8	0	5	8	7	6	10
Financial penalties for excessive consumption of energy	4	3	9	11	3	6	5	4	6	7	4	6	*13*	8	11

Table 4.5. Study 4 – Frequency analysis of the ranks for each factor's perceived influence on saving energy in the workplace. The data displayed show the number of respondents who ranked each factor at each point on the scale. The highest frequency for each factor is shown in italics (*N* = 100)

	Most influential														Least influential
Scale item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Feedback from my energy employer on the amount of energy saved annually	0	6	3	4	9	8	4	13	7	5	*14*	7	4	11	5
The attitudes and behaviour of fellow colleagues	6	*15*	8	7	7	4	7	6	9	10	7	4	6	2	2
My sense of social responsibility	14	7	*15*	10	5	7	1	6	7	6	4	5	*4*	3	6
Believing that climate change is man made	3	2	6	18	6	5	6	3	4	6	2	*6*	6	8	*19*
My belief there is a need to save energy commercially	9	8	11	*5*	9	1	12	*13*	6	2	*3*	5	8	4	4
My willingness to participate in workplace environmental actions	5	4	4	6	8	10	11	3	*13*	7	7	8	7	4	3
Avoidance of disciplinary action from my employer for not following environmental policies	4	4	2	6	5	*6*	6	5	*2*	*15*	*7*	8	*15*	7	8
Belief in the reality of climate change	3	7	9	2	4	8	5	7	4	3	11	13	5	*15*	4
Training to give clear and practical information in order to carry out environmental policies	*2*	3	8	4	5	5	*6*	10	6	4	12	8	*15*	7	5
Reward scheme in the workplace for correctly following environmental policies	4	7	5	4	5	3	7	5	5	*6*	8	8	7	11	*15*
Believing my actions will make a difference	8	*12*	6	3	9	8	7	9	4	8	3	2	7	8	6
Management and superiors leading by example	9	6	6	*7*	3	8	9	1	*13*	6	4	11	5	3	9
Respect of environmental policies at work	*21*	10	6	5	11	8	3	4	8	6	4	5	2	5	2
The attitudes and behaviours of superiors	3	4	9	11	11	*12*	8	6	6	11	5	3	4	4	3
My sense of responsibility to my employer	9	5	2	8	3	7	8	9	6	5	9	7	*5*	8	9

This frequency analysis has identified some differences in the factors that are perceived to impact energy saving at home and in the workplace. The next step was to explore these differences further and elucidate the magnitude and significance of their impact by analysing the mean and median ranks for each factor in home and work contexts.

4.8.2 Median and Mean Ranks Analysis

The purpose of this analysis was to identify the factors that are perceived to influence respondents' energy saving at home and in the workplace and explore if, and to what extent, the influence of intrinsic and extrinsic factors is perceived to change according to context. Descriptive analysis was conducted separately on the home and work energy behaviour scales. Rank positions were calculated with consideration to the mean and median scores. Lower mean and median scores show that the factor was ranked as more important and thus was perceived to have a stronger influence on behaviour (see Table 4.6 and Table 4.7).

When both the mean and median ranks were considered, the factor 'my sense of social responsibility', which was categorised as an intrinsic factor, was ranked as the most influential factor on energy saving at home. This factor was also the second most important factor on energy saving at work. The factor perceived most influential for work behaviour was also an intrinsic factor, 'respect of environmental policies at work'. The 'price of electricity and gas' was ranked as the second most influential factor for the home followed by 'the attitudes and behaviour of friends/family/colleagues', both extrinsic factors. The latter of these items was also ranked as the third most important for work behaviour. It appears that there is a large degree of similarity in the factors that are perceived to have the strongest influence on energy behaviour in home and work contexts. Taking the top five factors for each context shows three identical items, although not in the same order, ('my sense of social responsibility', 'the attitudes and behaviour of others (friends and family, or colleagues and superiors), and 'my belief that there is a need to save energy'). These are a mix of both intrinsic and extrinsic factors.

There were also some noticeable differences in the rankings across contexts. It seems that information and incentives was perceived to have a greater influence on behaviour at home compared with in the workplace. For example, the factors 'feedback on energy use', 'rewards for saving energy' and 'training and information on how to save energy' had substantially higher rankings for the home energy scale compared with the equivalent work scale. In contrast, having 'good role models and leadership' was perceived as more important in the workplace. This latter finding, coupled with the high rank of 'respect of environmental policies at work' and 'the attitudes and behaviours of superiors' suggests that organisational factors in the workplace such as management training, support, and organisational culture are perceived to have a strong influence on the degree to which employees engage with pro-environmental behaviour.

Table 4.6. Study 4 - Descriptive analysis for each item's perceived influence on saving energy at home (*N* = 100)

Rank position	Scale item	Categorisation	*Mdn*	*M*	*SD*
1	My sense of social responsibility	I	6.00	6.40	3.72
2	The price of electricity and gas	E	6.00	6.51	4.28
3	The attitudes and behaviour of friends and family	E	6.00	6.79	4.41
4	My financial resources	E	6.50	6.80	4.34
5	My belief that there is a need to save energy	I	7.00	6.68	4.32
6	Rewards for saving energy	E	8.00	7.79	4.30
7	Feedback on energy use	E	8.00	8.02	4,74
=9	My willingness to change my lifestyle	I	8.00	8.10	3.85
=9	Training and information on how to save energy/follow policies	E	8.00	8.10	3.54
10	Believing my actions will make a difference	I	8.00	8.17	4.45
11	Believing that climate change is man-made	I	8.00	8.55	4.35
12	Penalties/disciplinary action for excessive consumption/not following policies	E	9.00	8.85	4.50
13	Belief in the reality of climate change	I	10.00	8.95	4.27
14	Availability of grants to make property more energy efficient	E	10.00	9.34	3.83
15	Good role models and leadership	E	12.00	10.95	3.36

Note. E = extrinsic factor. I = intrinsic factor.

Table 4.7. Study 4 – Descriptive analysis for each item's perceive influence on saving energy in the workplace (*N* = 100)

Rank position	Scale item	Categorisation	*Mdn*	*M*	*SD*
1	Respect of environmental policies at work	I	5.00	5.97	4.28
2	My sense of social responsibility	I	5.00	6.46	4.44
3	The attitudes and behaviours of colleagues	E	7.00	6.86	4.02
4	My belief that there is a need to save energy	I	7.00	7.04	4.20
5	The attitudes and behaviours of superiors	E	6.50	7.21	3.65
6	Believing my actions will make a difference	I	7.00	7.42	4.45
7	Good role models and leadership	E	9.00	7.96	4.39
8	My willingness to participate at work	I	8.00	8.02	3.77
9	My sense of responsibility to my employer	I	8.00	8.41	4.40
10	Believing that climate change is man-made	I	9.00	8.88	4.68
11	Belief in the reality of climate change	I	10.00	8.89	4.30
12	Feedback on energy use	E	9.00	8.94	3.74
13	Training and information on how to save energy/follow policies	E	10.00	9.15	3.94
=15	Rewards for following work policies	E	10.00	9.40	4.53
=15	Penalties/disciplinary action for excessive consumption/not following policies	E	10.00	9.40	4.08

Note. E = extrinsic factor. I = intrinsic factor.

4.8.3 The Influence of FITness and Intrinsic and Extrinsic Factors on Energy Saving at Home and Work

These analyses explore whether the factors that are perceived to influence energy saving at home and in the workplace are different for individuals with higher and lower levels of personal FITness. Respondents were split into higher and lower FIT groups according to the median score on the FIT Integrity and Behavioural Flexibility scales. Respondents with scores equal to and below the median were allocated to the 'lower' FITness groups on these scales and respondents with scores above the median were allocated to the 'higher' FITness groups. Descriptive statistics for the FIT Integrity and Behavioural Flexibility variables and respective groups are presented in Table 4.8.

The descriptive statistics show, once again, that levels of personal FITness are generally low, particularly for the Behavioural Flexibility dimension. The maximum Behavioural Flexibility score in this sample is much lower than the maximum possible score of 100.

Table 4.8. Study 4 – Descriptive statistics for FIT variables and lower and higher FIT groups (*N* = 100)

				95% CI					
FIT dimension	*N*	*M*	*SE*	LL	UL	*Mdn*	Min.	Max.	*SD*
FIT Integrity	100	55.56	1.53	52.57	58.66	57.00	14.00	80.00	15.27
Lower	50	42.88	1.40	40.08	45.67	44.00	14.00	56.00	9.82
Higher	50	68.24	0.92	66.39	70.09	68.00	58.00	80.00	6.49
Behavioural Flexibility	100	18.44	1.52	15.42	21.46	17.00	1.00	69.67	15.13
Lower	50	6.57	0.72	5.12	8.02	6.67	1.00	17.00	5.10
Higher	50	30.56	1.72	27.11	34.05	27.00	17.67	69.67	12.01

Note. LL = lower limit for 95% Confidence Interval; UL = upper limit for 95% Confidence Interval.

Mann Whitney-U tests were used to explore whether the context surrounding saving energy behaviours at home and work differed according to personal level of FITness. The analyses were conducted for FIT Integrity and Behavioural Flexibility groups separately in order to investigate the effect of cognitive and behavioural FITness, respectively. The results for a home context are presented in Table 4.9 and Table 4.11, and Table 4.10 and Table 4.12 present the results for a work context. The mean and median ranks are shown for both energy scales with lower scores showing the factor was ranked as more important/influential. The inferential analyses were conducted one-tailed in accordance with the hypotheses.

4.8.3.1 The influence of Behavioural Flexibility

The results comparing energy saving at home for higher and lower Behavioural Flexibility groups revealed two significant differences when $p < .05$ (one-tailed), however, none of these differences remained significant when the Bonferroni corrected alpha level was used ($p < .003$). Although not statistically significant, there were some noticeable differences in the rankings for the lower and higher Behavioural Flexibility groups. Firstly, 'belief in the reality of climate change', a factor intrinsic to the individual, was ranked 14th by individuals with lower levels of Behavioural Flexibility and 7th by individuals with higher levels of Behavioural Flexibility. Secondly, respondents with lower levels of Behavioural Flexibility ranked the extrinsic factor

of ‘the price of electricity and gas’ as the most important factor whereas this factor was ranked 5th for individuals with higher levels of Behavioural Flexibility (see Table 4.9).

These results show some clear differences in the factors that are perceived to influence energy saving behaviours at home for individuals with higher and lower levels of Behavioural Flexibility. The external factors of cost and finances were ranked as more important for individuals with lower levels of Behavioural Flexibility, whereas intrinsic factors such as personal beliefs had a stronger influence on behaviour for individuals with higher FITness levels.

A similar comparison between higher and lower Behavioural Flexibility groups for energy saving behaviours performed at work showed two significant differences (at $p < .05$) and one difference that was verging on statistical significance. However, none of these remained statistically significant when the Bonferroni corrected alpha level was used ($p < .003$). Despite not being statistically significant, the directions of these differences were supported expectations and suggest that intrinsic variables are perceived to have a stronger influence on behaviour for individuals with higher levels of Behavioural Flexibility. The first noticeable difference showed that ‘belief there is a need to save energy commercially’ was ranked as more influential for individuals with higher levels of Behavioural Flexibility compared with individuals with lower levels of Behavioural Flexibility. The second noticeable difference was for ‘avoidance of disciplinary action from my employer for not following environmental policies’. The direction of this difference suggests that this factor was perceived as more important for individuals with lower levels of Behavioural Flexibility. The third noticeable difference was for ‘respect of environmental policies at work’. This factor was perceived as more important for individuals with lower levels of Behavioural Flexibility (see Table 4.10).

Table 4.9. Study 4 – Descriptive and inferential statistics for each factor's perceived influence on energy saving at home for 'lower' and 'higher' Behavioural Flexibility groups (*N* = 100)

	Lower FIT group				Higher FIT group					
Scale item	*Mdn*	*M*	*SD*	Overall rank	*Mdn*	*M*	*SD*	Overall rank	*Z*	*p*
Feedback from my energy company showing energy used	8.00	7.79	4.70	8	8.00	8.47	4.79	11	-0.83	.21
The attitudes and behaviour of friends and family	7.00	7.07	4.62	4	5.00	6.35	4.17	3	-0.59	.28
My sense of social responsibility	6.50	6.68	3.70	2	5.00	6.09	3.80	2	-0.84	.20
Believing that climate change is man made	9.00	8.96	4.41	12	7.00	8.09	4.30	8	-0.92	.18
Financial rewards for reducing energy consumption	7.00	7.39	4.32	6	9.00	8.30	4.31	10	-0.97	.17
My willingness to change my lifestyle	8.00	7.82	3.62	9	9.00	8.51	4.16	12	-0.96	.17
Clear and practical information on how to save energy	8.00	8.14	3.51	11	8.00	7.91	3.54	7	-0.40	.35
My belief that there is a need to save energy	7.50	7.18	4.60	5	5.00	6.02	3.92	1	-1.12	.13
My financial resources	6.50	6.89	4.40	3	7.00	6.81	4.30	4	-0.07	.47
Availability of grants to make property more energy efficient	10.00	9.59	3.65	13	10.00	9.02	4.11	13	-0.55	.29
Belief in the reality of climate change	10.00	9.68	4.16	14	8.00	7.91	4.26	7	-2.04	.02*
Government and local authorities leading by example	12.00	11.25	3.21	15	11.00	10.47	3.53	15	-1.13	.13
The price of electricity and gas	6.00	5.75	3.91	1	7.00	7.58	4.57	5	-1.96	.02*
Believing my actions will make a difference	7.00	8.14	4.40	11	8.00	8.12	4.58	9	-0.12	.45

*$p < .05$.

Table 4.10. Study 4 – Descriptive and inferential statistics for each factor's perceived influence on energy saving at work for 'lower' and 'higher' Behavioural Flexibility groups (*N* = 100)

Scale item	Lower FIT group				Higher FIT group				*Z*	*p*
	Mdn	*M*	*SD*	Overall rank	*Mdn*	*M*	*SD*	Overall rank		
Feedback from my employer on the amount of energy saved annually	8.50	9.00	4.13	11	9.00	8.80	3.33	10	-19	.42
The attitudes and behaviour of fellow colleagues	7.50	7.14	4.12	4	6.00	6.53	3.93	4	-0.49	.31
My sense of social responsibility	6.00	6.84	4.31	2	4.00	6.05	4.65	1	-0.29	.38
Believing that climate change is man made	9.00	8.76	4.74	15	8.00	8.94	4.69	12	-0.23	.41
My belief that there is a need to save energy commercially	8.00	7.62	3.77	5	5.00	6.43	4.60	2	-1.69	.04*
My willingness to participate in workplace environmental actions	9.00	8.36	3.91	8	7.00	7.65	3.66	7	-0.96	.17
Avoidance of disciplinary action from my employer for not following environmental policies	10.00	8.74	4.16	9	11.00	10.12	3.96	15	-1.65	.04*
Belief in the reality of climate change	10.50	9.10	4.39	12	8.00	8.63	4.28	9	-0.63	.26
Training to give clear and practical information in order to carry out environmental policies	10.00	8.84	4.12	10	9.00	9.63	3.58	13	-0.94	.17
Reward scheme in the workplace for correctly following environmental policies	9.50	9.62	4.39	13	11.00	9.08	4.72	14	-0.59	.27
Believing my actions will make a difference	7.00	7.70	4.42	6	7.00	7.08	4.54	5	-0.76	.22
Management and superiors leading by example	9.00	8.32	4.13	14	9.00	7.67	4.67	8	-0.66	.25
Respect of environmental policies at work	4.50	5.50	4.52	1	6.00	6.53	4.02	4	-1.51	.06
The attitudes and behaviours of superiors	6.00	6.96	3.92	3	7.00	7.49	3.40	6	-0.49	.31
My sense of responsibility to my employer	8.00	7.76	4.37	7	8.00	8.94	4.34	12	-0.29	.38

*$p < .05$.

4.8.3.2 The influence of FIT Integrity

The results comparing ranks on the home energy scale for higher and lower FIT Integrity groups showed two statistically significant differences between the groups (p <.05), and one difference that was verging on statistical significance (see Table 4.11). However, none of these differences remained statistically significant when the Bonferroni correct alpha level was used (p <.003). Although not statistically significant, there were some noticeable differences in the rankings for the lower and higher FIT Integrity groups. Respondents with higher levels of FIT Integrity ranked the factor 'my belief that there is a need to save energy' as less important compared with respondents with lower levels of FIT Integrity. The factor 'clear and practical information on how to save energy' was ranked as more important for respondents with higher levels of FIT Integrity as was the factor 'Government and local authorities leading by example'. These small but noticeable differences in their rank position contradict prior expectations.

There was one statistically significant difference (p <.003) between higher and lower FIT Integrity groups for the work energy saving scale. The results show that respondents with lower levels of FIT Integrity ranked 'avoidance of disciplinary action from my employer for not following environmental policies' as significantly more important compared with respondents with higher levels of FIT Integrity. The second noticeable difference was between respondents' ranking of 'willingness to participate in workplace environmental actions'. Respondents with lower levels of FIT Integrity ranked this item as more important/influential compared with respondents with higher levels of FIT Integrity (see Table 4.12).

Overall, there was a large degree of similarity in the factors that are perceived to influence energy saving at work for higher and lower FIT Integrity groups. The items 'respect for environmental policies at work' and 'my sense of social responsibility' had the strongest influence on behaviour for both FIT groups.

Table 4.11. Study 4 – Descriptive and inferential statistics for each factor's perceived influence on energy saving at home for 'lower' and 'higher' FIT Integrity groups (*N* = 100)

Scale item	Lower FIT group				Higher FIT group				*Z*	*p*
	Mdn	*M*	*SD*	Overall rank	*Mdn*	*M*	*SD*	Overall rank		
Feedback from my energy company showing energy used	9.00	8.22	4.92	8	7.50	7.82	4.60	10	-0.32	.35
The attitudes and behaviour of friends and family	5.50	6.40	4.05	3	7.00	7.18	4.76	3	-0.66	.25
My sense of social responsibility	6.00	6.50	3.73	4	5.00	6.30	3.75	1	-0.33	.37
Believing that climate change is man made	8.50	8.32	4.02	9	8.00	8.78	4.69	11	-0.50	.31
Financial rewards for reducing energy consumption	8.50	7.90	4.32	7	6.50	7.68	4.30	8	-0.22	.41
My willingness to change my lifestyle	9.00	8.60	3.80	11	7.50	7.60	3.86	7	-1.23	.11
Clear and practical information on how to save energy	9.00	8.82	3.47	13	7.50	7.38	3.50	4	-1.74	.04*
My belief that there is a need to save energy	5.00	5.80	4.15	1	8.00	7.56	4.34	6	-2.03	.02*
My financial resources	5.00	6.14	4.06	2	8.00	7.46	4.55	5	-1.40	.08
Availability of grants to make property more energy efficient	10.00	9.58	3.65	14	10.00	9.10	4.00	12	-0.38	.36
Belief in the reality of climate change	9.50	8.64	4.69	12	10.00	9.26	3.83	13	-.51	.30
Government and local authorities leading by example	12.50	11.42	3.28	15	11.00	10.48	3.42	15	-1.47	.07
The price of electricity and gas	6.00	6.70	4.18	5	6.00	6.32	4.41	2	-0.65	.25
Believing my actions will make a difference	8.00	7.26	4.79	6	7.50	7.72	4.08	9	-1.03	.15
Financial penalties for excessive consumption of energy	8.50	8.34	4.24	10	10.50	9.36	4.73	14	-1.12	.13

*$p < .05$.

Table 4.12. Study 4 – Descriptive and inferential statistics for each factor's perceived influence on saving energy at work for 'lower' and 'higher' FIT Integrity groups (*N* = 100)

Scale item	Lower FIT group				Higher FIT group				*Z*	*p*
	Mdn	*M*	*SD*	Overall rank	*Mdn*	*M*	*SD*	Overall rank		
Feedback from my employer on the amount of energy saved annually	10.50	9.48	3.75	14	8.00	8.44	3.71	8	-1.04	.15
The attitudes and behaviour of fellow colleagues	7.50	7.27	3.64	5	6.00	6.48	4.34	3	-0.98	.16
My sense of social responsibility	6.00	6.69	4.21	2	4.00	6.25	4.69	2	-1.16	.12
Believing that climate change is man made	9.00	8.94	4.54	12	9.00	8.90	4.32	13	-0.71	.24
My belief that there is a need to save energy commercially	6.50	6.81	4.31	3	7.00	7.25	4.14	6	-0.10	.47
My willingness to participate in workplace environmental actions	7.00	7.38	3.70	5	9.00	8.62	3.78	9	-1.72	.04*
Avoidance of disciplinary action from my employer for not following environmental policies	8.00	8.10	4.05	8	11.50	10.60	3.77	15	-3.24	.0005*†
Belief in the reality of climate change	11.00	8.88	4.33	11	9.00	8.90	4.32	13	-0.14	.44
Training to give clear and practical information in order to carry out environmental policies	11.00	9.62	4.00	15	9.00	8.71	3.87	11	-0.60	.27
Reward scheme in the workplace for correctly following environmental policies	10.00	9.25	4.63	13	10.50	9.54	4.49	14	-0.75	.22
Believing my actions will make a difference	8.00	7.69	4.87	7	6.50	7.17	4.06	4	-0.67	.25
Management and superiors leading by example	8.00	8.19	4.51	10	9.00	7.75	4.31	7	-0.11	.45
Respect of environmental policies at work	6.00	6.38	4.63	1	5.00	5.60	3.95	1	-0.70	.24
The attitudes and behaviours of superiors	7.00	7.17	3.63	4	6.00	7.25	3.70	6	-0.42	.33
My sense of responsibility to my employer	8.00	8.17	4.55	9	8.50	8.63	4.29	10	-0.40	.34

*$p < .05$. †$p < .003$ (Bonferroni adjusted alpha level).

4.8.4 The Effect of Context on Pro-environmental Behaviours

Following on from Study 1 and Study 2, this analysis explores the spillover in the performance of pro-environmental behaviours at home and in the workplace. The seven pro-environmental

behaviours contained in each scale were identical and the cross-context relationship were explored by correlation analyses. The results are presented in Table 4.13.

Six out of the seven item relationships were statistically significant, and all were positive relationships and at least moderate in strength. The pattern of means suggest that respondents performed all of the pro-environmental behaviours more frequently in a home context compared with the workplace. Put differently, there was a negative spillover from a home context to a work context. This result repeats the findings of Study 1 and Study 2 (see Chapter 3), and concurs with some of the studies presented in the literature review. There was no context relationships for 'switching off IT equipment overnight'.

Table 4.13. Study 4 – Pearson's correlations and descriptive statistics for home and workplace pro-environmental behaviours

			Home		Work	
Scale item	*n*	*r*	*M*	*SD*	*M*	*SD*
Think before printing	93	.46**†	3.06	1.11	2.91	1.07
Print/photocopy double-sided	89	.65**†	2.24	1.14	2.28	1.01
Use scrap paper (for notes/internal document printing)	96	.59**†	2.80	1.02	2.55	1.00
Turn the monitor off when not in use	91	.32**†	3.04	1.07	2.36	1.14
Switch off IT equipment overnight	95	.13	3.60	0.67	3.42	0.91
Turn the lights off	96	.27**	2.72	1.05	2.25	1.00
Reuse packaging or stationery	92	.48**†	2.60	1.15	2.01	1.16
Total	74	.43**†	20.89	4.19	19.22	4.02

*$p < .05$. **$p < .001$.

4.8.5 The Influence of FITness on Home and Work Pro-environmental Behaviour

The effect of FIT variables on pro-environmental behaviours performed in home and work contexts was explored by a 2-way factorial MANOVA with 2 between-subjects factors (FIT Integrity and Behavioural Flexibility groups) and the total home and work pro-environmental behaviour scores as correlated dependent variables. Descriptive statistics are presented in Table 4.14.

Preliminary assumption testing indicated no problem with group covariances, *Box's M* = 10.55, $p = .35$, indicating no violation to this assumption. The Levene's test also indicated no violations

to the homogeneity of variances for the home and work pro-environmental behaviour scales (Levene's p = .63 and p = .11 for home and work scales, respectively). The MANOVA result indicated two significant multivariate main effects for FIT Integrity and Behavioural Flexibility ($F(2, 69) = 6.23$, $p = .001$; $F(2, 69) = 8.46$, $p = .0005$, respectively). Follow-up univariate ANOVAs showed three significant main effects, these were for FIT Integrity on home and work pro-environmental behaviours ($F(1, 70) = 6.25$, $p = .005$; $F(1, 70) = 0.63$, $p = .001$), and a main effect of Behavioural Flexibility on work pro-environmental behaviour ($F(1, 70) = 17.00$, $p < .01$). The pattern of means shows that individuals with higher levels of personal FITness perform more pro-environmental behaviours in each of these contexts.

Table 4.14. Study 4 – Descriptive statistics (*M*; *SD*) for home and work pro-environmental behaviours (matched scales) for FIT Integrity and Behavioural Flexibility groups

	FIT Integrity		Behavioural Flexibility	
	Low (n = 50)	High (n = 50)	Low (n = 38)	High (n = 36)
Home behaviour	19.73 (4.37)	22.05 (3.71)	20.45 (4.23)	21.36 (4.15)
Work behaviour	17.97 (3.91)	20.46 (3.79)	17.66 (4.34)	20.86 (2.91)

4.9 Discussion

Study 4 sought to identify the factors that are perceived to influence energy saving in home and work contexts. It also sought to explore whether the factors that are perceived to influence energy saving differ according to levels of FITness, and whether levels of personal FITness influence pro-environmental behaviours performed at home and in the workplace. In line with expectations, the results confirm that pro-environmental activity does change according to site of practice. These results follow-on and support the findings from Study 1 and Study 2 and suggest, once again, that pro-environmental behaviours are performed more frequently in and around the home compared with in the workplace. Put differently, there was a negative spillover from a home context to the workplace. Also in line with the results of Study 1 and Study 2 is the finding that individuals with higher levels of personal FITness perform more pro-environmental behaviours in home and work contexts. The effect of FIT Integrity was expected but the positive effect of Behavioural Flexibility for pro-environmental behaviours performed at work was not predicted based on the results of previous studies.

Concerning the factors that are perceived to influence pro-environmental action in home and work contexts, the results show that there was a large degree of similarity in the factors that influenced energy saving at home and work. Intrinsic variables, such as a personal belief in the need to save energy and a strong sense of personal responsibility were perceived to have the strongest influence on behaviour in each context. The differences that emerged showed that having good role models and leadership is perceived to be particularly important for guiding behaviours performed in the workplace. Cost and personal finances were perceived to have a stronger influence on behaviours performed at home. The differences between the contexts suggest that extrinsic factors such as social and physical features of the environment are believed to have a large influence on whether employees act pro-environmentally.

The results also suggest that the factors that influence pro-environmental action also differ according to level of FITness. Overall, intrinsic variables were perceived to have a stronger influence on behaviour for individuals with higher levels of personal FITness. For individuals with lower levels of personal FITness, behaviour was believed to be more susceptible to the effect of extrinsic factors in the social and physical context.

4.10 General Discussion

The purpose of Study 3 and Study 4 was to explore the perceived influence of intrinsic and extrinsic factors on pro-environmental activity. The empirical studies investigated the perceived impact of intrinsic and extrinsic factors on energy saving in two sites of practice: in and around the home and in the workplace. In addition, Study 3 explored separately whether the factors that influence pro-environmental behaviours are perceived to remain stable over time. Study 4 explored the spillover in pro-environmental activity across home and work contexts, and whether the factors that influence energy saving were different for individuals with higher and lower levels of personal FITness. This, as far as I know, is one of the first studies to systematically explore the perceived influence of intrinsic and extrinsic factors on pro-environmental behaviour, and make a context comparison between home and work environments.

There have been a few studies that have explored the spillover in pro-environmental behaviour (see Truelove et al, 2014 for a review) but only a few of these have made a cross-context comparison (e.g., Littleford et al, 2014; McDonald, 2011; Tudor et al, 2007). None, as far as I am aware, have systematically explored the perceived influence of intrinsic and extrinsic determinants on behaviour, even though this has been requested by researchers (Stern, 2000;

Ones & Dilchert, 2012). Previous studies have shown an inconsistent pattern in the direction of the spillover in pro-environmental activity between the home and work contexts (see Littleford et al, 2014; McDonald, 2011). Some have suggested a positive spillover whereas others have suggested a negative one (see Barr et al, 2010). The previous studies in this programme of research suggest that generally, pro-environmental actions are performed more frequently at home compared with in an organisational setting. To further this research, these studies explored the differences between contexts, explored why these differences might occur, and considered how they might differ according to levels of personal FITness. This, it is hoped, will help to improve the validity of models of pro-environmental behaviour to contexts outside of the home, and also support the design of behaviour change interventions.

The inclusion of FITness in the current studies was novel and justified by the findings of Study 1 and Study 2. These studies were the first to undertake an empirical investigation of the influence of FIT variables on pro-environmental activity in the workplace. These results, coupled with the findings of previous research that indicates individuals with higher levels of personal FITness are more successful at achieving personal projects (for example, see Hanson, 2008), suggest that developing personal FITness levels might be a successful way to encourage individuals to engage with pro-environmental behaviours in different sites of practice, and also to support individuals to develop lifestyles that are overall more environmentally sustainable.

4.10.1 Reviewing the Hypotheses

With consideration to the literature review and the results of previous studies (Study 1 and Study 2), the following hypotheses were set, and will now be reviewed:

Study 3 was designed to test the research methodology but based on the larger than anticipated sample size, three hypotheses were set, post-hoc:

> H_{3a}: Both social and physical aspects of the context will be perceived to influence respondents' energy saving at home.
>
> H_{3b}: Both social and physical context factors will be perceived to influence respondents' future energy saving at home.
>
> H_{3c}: The social and physical context factors that are perceived to influence respondents' energy saving at home will change over time.

There was a large degree of stability in the factors that are perceived to influence energy saving currently and in the future. A comparison of the current and future energy saving scales showed

that the influence of 60% of the factors was perceived to remain stable over time. There were some differences between scales, and these showed that personal beliefs were believed to have the strongest influence on current behaviour whereas extrinsic factors related to finance (e.g., such as 'the cost of energy' and 'significant others such as Government and local authorities leading by example') were perceived to be more important in the future. The latter factors are extrinsic variables upon which individuals have a limited amount of direct control, but they also define the macro-environment in which individuals are able to structure their behaviours. Overall, these results partially support the Hypotheses 3_a, 3_b and 3_c.

Study 4 explored the following hypotheses:

> H_{4a}: There will be a difference in the strength of influence of the factors perceived to influence respondents' energy saving at home and in the workplace.
>
> H_{4b}: It is expected that external factors will be perceived to have a stronger influence on energy saving in a home environment for individuals with lower levels of personal FITness.
>
> H_{4c}: It is expected that external factors will be perceived to have a stronger influence on energy saving in a work environment for individuals with lower levels of personal FITness.
>
> H_{4d}: It is expected that individuals with higher levels of FIT Integrity will perform more pro-environmental behaviours in home and work contexts (see Study 1 and Study 2).
>
> H_{4e}: It is expected that levels of Behavioural Flexibility will have no effect on performance of pro-environmental behaviours in home and work contexts (see Study 1 and Study 2).

Some differences between home and work environments emerged. The factors perceived to have the strongest influence on energy saving at home were: personal financial resources; the price of energy; the attitudes and behaviours of friends and family; and an individual's personal sense of social responsibility. The last two of these factors were also perceived to have a strong influence on energy saving at work. The factors perceived to have the largest influence for a work context were an individual's respect for environmental policies in the workplace, followed by a sense of personal responsibility. The cross-context comparison indicated that the factor relating to respect for environmental policies was perceived as more important in a work setting compared with at home. This comparison also revealed that good role models were perceived as more important at work compared with at home whereas feedback, rewards, and

training to encourage energy saving were perceived as more important at home. Overall, the results support Hypothesis 4_a and suggest that the factors that are perceived to influence energy saving in and around the home are somewhat different from those that are perceived influential in the workplace.

The influence of FITness was apparent on overall levels of pro-environmental activity in home and work settings as well as on the factors that are perceived to influence energy saving. In general, extrinsic factors were perceived to have a stronger influence on behaviour for individuals with lower levels of FITness. This pattern of results was evident for both a home and work environment, and for FIT Integrity and Behavioural Flexibility groups. These results support Hypotheses 4_b, 4_c, 4_d and partially support Hypothesis 4_e. Unexpectedly, levels of Behavioural Flexibility had an influence on performance of pro-environmental activity in the workplace.

4.10.2 The Factors Perceived to Influence Energy Saving at Home and in the Workplace

The results of Study 3 suggest that not only is an individual's micro social context in and around the home perceived important for encouraging energy saving, but external factors in the macro context, including the culture of saving energy in society, are also important and are perceived to have a stronger influence on future behaviour. Individuals have greater control over the former factors compared with the latter, and if motivated to do so, are able to 'design' a home environment that supports their pro-environmental beliefs and behavioural intentions. This might help to facilitate pro-environmental action. The lower level of personal control over the macro external context could mean that future efforts are counteracted by changes in the political, societal, and economic system, and this might make individuals feel helpless or as though they are lacking the skills and abilities to behave appropriately. Having a sufficient level of flexibility, rather than being too bound by habit, might help individuals to adapt appropriately to a changing future environment.

Of particular interest in Study 4 was the workplace. The results from Study 4 (and Study 1 and Study 2), and others alike (e.g., McDonald, 2011; Tudor et al, 2007; Littleford et al, 2014), show that the energy saving practices performed at home are not transferred to a work environment, or vice versa. In other words, there is a negative spillover from home to the workplace. It seems that factors in the workplace can constrain behaviours and prevent pro-environmental action being carried forward from home (see Giddens, 1984). For whatever reasons, individuals do not take their whole self to work. There are several pro-environmental behaviours that people

perform at home but they perform less consistently in the workplace, and it is this transition from one site of practice to another that warrants further elucidation.

In recent years there has been significant activity surrounding the establishment of policy frameworks for encouraging and embedding environmental practices into the workplace and this has included, for example, the ISO internationally recognised standards. However, research exploring the impact of environmental infrastructure and work systems changes on an organisation's environmental impact suggests the effects are limited (Ucci, 2010; Hertin, Berkhout, Wagner & Tyteca, 2008). It seems that employees' responses and engagement with the changes are critical for tipping the balance from inaction to action (Davis, Leach & Clegg, 2011).

To enable effective responses, employees need to be sufficiently aware of their employer's goals, so as to behave appropriately in accordance with these. As discussed previously, established practices might be constrained significantly by existing habits. Individuals often do not have a sufficient level of awareness of their own behaviours so it is also likely that they might not be sufficiently aware of their employer's environmental commitments and intents too, particularly if these are not exemplified explicitly by middle management (Andersson et al, 2005; Daily et al, 2009; Ramus & Steger, 2000). The strength of existing habits can disconnect an individual's behaviours from both their own and their employer's pro-environmental intentions.

In line with this reasoning, the results of Study 4 also suggest that workplace policies and procedures alone may not be sufficient to encourage pro-environmental activity at work, and what might be needed instead is development at an individual level so that an overall more supportive work culture can be developed throughout the organisation. This might include a culture of understanding and respect for the need to embed environmental sustainability issues throughout the whole organisation, and also development of personal abilities to enable this to happen. This development should include both employees and also management teams; the latter to provide good leadership and positive role models to employees. This proposal also concurs with other researchers who suggest that the effectiveness of environmental management depends on leadership (Ramus & Steger, 2000; Egri & Herman, 2000). The environmental leadership shown by top and middle management can have a critical impact on employees' attitudes and behaviour (Banerjee, Iyer & Kashyap, 2003; Andersson et al, 2005; Daily et al, 2008). Individuals are often influenced by what they think is expected from them, as

per regulations and policies, but also by their expectations that others will behave in a similar fashion (Georg, 1999).

In relation to this, the results of Study 4 also suggest that the organisational factors of culture, leadership and management, are particularly important for encouraging individuals to engage with environmental sustainability issues in the workplace. These results concur with Robertson and Barling (2012) who found that the environmental descriptive norms and pro-environmental behaviours of leaders had a significant effect on the greening of organisations. According to Benton and Redclift (1994), the culture of an organisation can 'lock' employees into behavioural routines that are environmentally unsound. As a consequence of this, individuals can perform behaviours that contradict those performed in personal sites of practice such as at home. There is, therefore, a need to include culture in an organisation's environmental sustainability framework, to encourage environmentally sustainable practices at work (Shove, 2003).

It is likely that each organisation will need a different framework to encourage pro-environmental activity at work. However, the results of these studies identify the crosscutting theme of the influence of other people, as well as the skills and abilities of individuals themselves. Addressing the former point first, pro-environmental behaviours and energy-saving actions are social acts that can be reinforced by others in the community both locally (e.g., family, friends and colleagues) and in the wider context (e.g., Government). In particular, the results of the ranking tasks in Study 3 and Study 4 suggested that social influence in the form of 'the attitudes and behaviours of friends and family' was consistently perceived as one of the most influential factors on energy saving. Social norms are often used as a reference point for guiding one's own behaviour (Clapp & McDonnell, 2000) and have been shown to influence the amount of energy people consume in both domestic and non-domestic settings (see Norton, Zacher & Ashkanasy, 2014; Palm, 2009). The results of these studies support this assertion and concur with Nye and Hargreaves (2010) of the need to consider factors pertaining to the social context in models of pro-environmental behaviour and frameworks for pro-environmental behaviour change. It is, however, also important for individuals to have sufficient cognitive and behavioural abilities in order to perceive these social norms and be able to respond appropriately to them.

The results of these studies suggest that there is a degree of spillover in pro-environmental behaviour between home and work contexts but also marked differences across these sites of practice. This finding challenges the validity of established models of behaviour that have often

been developed within a domestic setting. Many established models of behaviour have been developed from the perspective of bounded rationality and define a direct relationship between intentions and behaviour. As the results of these empirical studies show, physical and social factors present in the structural design of the environment can have a substantial influence on pro-environmental activity in the workplace. These might weaken the intention-behaviour relationship significantly. The impact of these extrinsic factors needs to be considered in future models of behaviour that are designed for a non-domestic setting, and also in the development of behaviour change interventions that are intended to have an impact across different sites of practice. As the results to Study 4 show, individuals are capable of acting pro-environmentally at home, they might just need further encouragement to spillover this behaviour to the workplace.

4.10.3 The Influence of Personal FITness

The results of Study 4 not only identified the intrinsic and extrinsic factors that are perceived to influence energy saving at home and in the workplace, they also showed how the perceived extent of influence of each factor varied according to levels of personal FITness. The overall pattern of results suggests that individuals with lower levels of personal FITness have a higher tendency to be influenced by factors in the external environment (e.g., environmental policies) rather than their own intrinsic beliefs and behavioural competencies. The results of Study 4 indicated that respect of environmental policies at work, and avoidance of disciplinary action for not following environmental policies, were perceived to have a stronger influence on behaviour for individuals with lower levels of FITness. This might indicate that individuals with lower levels of FITness think they are more responsive to factors in the external environment and behave in accordance with these factors rather than being directed by their own intentions. The influence of these factors is good when the external environment is supportive of pro-environmental activity; it might just help these individuals to develop behaviours that are more pro-environmental. However, when the external environment is less supportive of pro-environmental activity, these individuals are unlikely to consider the environmental impact of their actions and continue with their largely unsustainable ways.

In contrast, individuals with higher levels of personal FITness perceived themselves to behave in accordance with intrinsic factors such as personal beliefs and levels of personal responsibility. It appears that when these characteristics are perceived to be sufficiently strong, they help to guide pro-environmental behaviours more consistently across contexts, regardless of the potential disruption of external factors. This might be because individuals with higher

levels of personal FITness are more flexible in their approach and have a wider repertoire of behaviour (as measured by Behavioural Flexibility). In other words, they are likely to be less habit bound and able to adapt: as Fletcher and Stead (2000, p.13) suggest "… FIT themselves to the demands of the situation. They will be … more able to cope with all situations …" Following this reasoning suggests that individuals with higher levels of personal FITness might, through the strength of the personal beliefs and intentions and greater behavioural flexibility, perform pro-environmental behaviours more consistently across different contexts. In other words, changes to external factors are less likely to disrupt the pro-environmental behaviour patterns of individuals with higher levels of personal FITness. In light of the findings of Studies 1-4, developing levels of personal FITness might help individuals to engage effectively in pro-environmental activity with a higher level of consistency.

4.10.4 Strengths and Limitations

These studies, as far as I am aware, were the first to undertake empirical examinations of the intrinsic and extrinsic factors that are perceived to influence energy saving in different sites of practice. They were the first to consider both the perceived influence of intrinsic and extrinsic factors in one study and make a comparison to explore the spillover across two sites of practice. Study 4 was also the first study to explore how the perceived determinants of energy saving differ according to levels of personal FITness. This research, therefore, advances knowledge of both the spillover and determinants of energy saving in two sites of practice and how FIT variables relate to this. The research reported here has also highlighted several areas for further investigation, including the role of FITness for helping individuals to develop the personal strengths needed to implement and maintain environmentally sustainable lifestyles.

These studies do have a number of limitations that must be acknowledged. First, the data collected were self-reported and included only the perceptions of individuals within different households and workplaces, rather than more objective observer reports (e.g., researcher or peer ratings of pro-environmental behaviour). This raises two potential limitations. Firstly, the accuracy of self-report data about energy consumption has been shown to vary, although not distorted in a systematic way to reflect lower levels of consumption, as might be expected (Warriner, McDougall, & Claxton, 1984). This does, however, suggest some potential inaccuracies with the data. However, using other methodologies such as peer ratings may not improve the accuracy because peers might not have the opportunity to observe employees' behaviour over long periods (Spector, 2006).

Second, routine energy-saving actions are often embedded as habits within a site of practice, be it at home or in the workplace. Measuring individuals from different households and workplaces with unknown contextual characteristics gives a large degree of unknown variance that could systematically influence the results. Whilst this approach has been useful for providing an insight into the factors that influence energy saving in each context, it does not give a comprehensive understanding of each context in particular, including the social dynamics and interactions between people. For future research it would be useful to run a case analysis of one or two households or organisations to explore in detail pro-environmental activity in a specific context with known characteristics, and from the perspective of more than one individual. This, too, would help to identify how the perceived effect of internal and external factors on energy saving actions might be mediated by personal strengths such as FITness.

Another potential limitation concerns the sampling. This study recruited respondents from the general population, a large percentage of whom were found to be students or individuals who were working either on a part-time or casual basis. It was decided to include the data from these individuals in the sample, but this does have the potential to distort the accuracy of the results somewhat, particularly regarding the determinants of energy saving in the workplace. In retrospect, a sample of individuals who are in full-time employment is perhaps more desirable. However, there is no reason to believe that the results found in Study 3 and Study 4 are uninformative; on the contrary, they provide novel and important insights into the factors that constrain and support energy saving at home and in the workplace. The results also have greater generalisability to different industry sectors.

4.11 Conclusions

The purpose of this Chapter was to explore empirically the spillover in the performance of pro-environmental behaviours in home and work contexts, and discover the factors that are perceived to influence behaviour in each of these sites of practice according to levels of personal FITness. The results of the empirical studies suggest that the pro-environmental behaviours performed in the workplace are relatively separate from behaviours performed in and around the home. There is a shift in pro-environmental action according to site of practice, and behaviour patterns that are established at home are often not transferred to work, or vice versa.

Second, the studies show that the intrinsic and extrinsic factors that are perceived to determine actions in the workplace are somewhat different from those that are perceived to determine behaviours at home. It seems that extrinsic variables have a larger negative influence on

individuals' performance of pro-environmental activity at work, and that currently many workplaces are far less supportive of pro-environmental activity overall (see also Schelly, Cross, Franzen, Hall & Reeve, 2011; Lo et al, 2014). This suggests that development of an organisational framework might help to encourage pro-environmental activity, and doing this in conjunction with the development of personal levels of FITness might have further benefits. As discussed previously, it is necessary for individuals to be sufficiently aware of the organisational framework, and feel capable of behaving in accordance with it. For reasons discussed previously, developing levels of personal FITness might help with both of these dimensions. Moreover, a FIT-based behaviour change intervention might have greater effectiveness in the workplace, especially compared with established methods of pro-environmental behaviour change that typically have been developed in a domestic setting and applied latterly to an organisational domain.

5 Exploring the Habit Characteristics of Pro-environmental Behaviours and their Relationship to FITness

5.1 Introduction

The empirical studies presented in Chapter 4 suggest that when it comes to performing pro-environmental behaviours, individuals have repertoires of behaviours that differ according to the site of practice and the influence of intrinsic and extrinsic factors. The change in behaviour that occurs from one context to another might be particularly pronounced when pro-environmental behaviours are characterised by habit and are, therefore, performed automatically in accordance with context cues in the environment rather than intentional processes. In such circumstances, different contexts have the potential to 'lock' people into set patterns of behaviour according to the presence and absence of factors in the external environment, and prevent spillover of the behaviour. The purpose of Study 5, therefore, was to elucidate further the factors that influence a range of pro-environmental behaviours (not just energy saving) using a similar methodology to Study 4, and to compare and contrast their perceived strength of influence. In sum, Study 5 explored the habit characteristics of a range of different pro-environmental behaviours.

Another finding of Study 4 was the differences in behaviour between individuals with higher and lower levels of FITness. These suggested that individuals with higher levels of FITness thought they were more likely to behave in accordance with intrinsic variables whereas individuals with lower levels of FITness thought they were more likely to behave in accordance with extrinsic variables. The latter of these groups are, therefore, potentially more susceptible to disruption towards pro-environmental practices. With these findings in mind, Study 5 explored the type and strength of influence of the factors that are perceived to determine a range of pro-environmental behaviours for individuals with higher and lower levels of FITness. It also explored the habit characteristics of pro-environmental behaviours according to the same FITness distinctions. The intention was to elucidate whether the habit characteristics of pro-environmental behaviours are different for individuals with higher and lower levels of FITness. Any noticeable differences between FIT groups will be considered in the design of the intervention that follows (Chapter 7), to help to increase the effectiveness of the behaviour-change approach for a range of different pro-environmental behaviours.

5.1.1 Habits and Pro-environmental Behaviour

The acknowledgement and understanding of habit as an explanation of behaviour has developed considerably over the past 10-years (e.g., Gardner, Abraham, Lally & de Bruijn, 2012). Habit has also become a more commonly known construct in models of pro-environmental behaviour, particularly in relation to those describing recycling and travel mode choice behaviours (e.g., Verplanken, 2014). Developing a better understanding of the habit characteristics of a range of pro-environmental behaviours simultaneously might help to encourage the positive spillover and offer an alternative approach for whole lifestyle change.

Personal energy consumption in day-to-day life provides a good illustration of how current lifestyles at present are environmentally unsustainable, largely as a result of habit. For example, acts such as leaving an unwatched TV on standby (rather than turning it off) and keeping lights on in unoccupied rooms demonstrate how negative environmental behaviours can be embedded in the rhythms of daily living. These actions tend not to be consciously controlled but occur automatically because of a matter of circumstance. They happen regularly, in the same context, and over time. As such, they are likely to occur as part of a daily routine. The repetition of performing the same act, in the same location, at the same (or similar) time, offers the potential for that behaviour to become more practiced and automatic, and therefore less dependent on conscious processing. Automaticity and reduced awareness are two of the characteristics of habit (Gardner, 2012). It might be that as habits manifest across different daily behaviours, people become more and more unaware of their daily routines and the degree to which these are environmentally sustainable or unsustainable. In other words, they become further entrenched in their habits.

As well as energy-consuming behaviours, other lifestyle behaviours, such as travel-mode choice, have been defined in the literature as having habit characteristics (e.g., Maréchal, 2010; Klöckner & Matthies, 2004). The empirical literature that has explored the habit characteristics of pro-environmental behaviours has tended to look at each class of behaviour independently and in isolation from other pro-environmental actions. The research has also tended to look at behaviour directly rather than to the factors that might support or constrain it. As far as I am aware, no empirical studies have explored and compared simultaneously the habit characteristics of a range of different pro-environmental behaviours. Study 5 explored the extent to which a range of daily pro-environmental behaviours are characterised by habit, and compared and contrasted their similarities and differences.

5.2 Literature Review

5.2.1 Habit Characteristics

Habits have been discussed in the psychological literature for over 100 years. For example, in 1890 James asserted to the importance of habits for efficiency in everyday life. His work recognised the role of habits in maintaining personal and social structure. They help to guide our everyday behaviours in an automatised way that requires minimal cognitive resources and deliberation. More recent conceptual definitions of habits have also supported the rationality of habits and how they maximise the utility of resources (Stigler & Becker, 1977). It is commonly agreed that habits are functional and that life without them would be cognitively challenging and somewhat disorganised. Habits allow people to function effectively in day-to-day life.

Habitual behaviour is typically conceptualised by four characteristics: frequency; stability; success; and automaticity, and each is interdependent (Klöckner & Verplanken, 2013). For example, every time a behaviour is performed in a stable context, and it successfully achieves the intended goal, the more likely the same behaviour will be automatically repeated in the same circumstances in the future. As the behaviour is performed frequently and successfully over a period of time in a stable context, it becomes less dependent on intention and guided more by habit (Triandis, 1977). In relation to this, Ouellette and Wood (1998) demonstrated that the stability of the context is critical to the development of habit. In their re-analysis of 64 studies covering different behaviour types, they found that those behaviours that were performed infrequently, say once or twice a year, and in an unstable context, were more strongly predicted by intention, whereas behaviour that was performed more frequently and in a stable context was predicted less by intention and more by past behaviour or habit.

The two most prominent approaches that have been used to explain how behaviours become linked to situational cues and characterised by habit are the connectionist approach (e.g., Neal et al, 2006) and the script-based approach (e.g., Aarts & Dijksterhuis, 2000). These approaches are not mutually exclusive. The connectionist approach (Neal et al, 2006) explains habit development from the perspective of neuronal connections in the brain. The simultaneous activation of the neuronal structures responsible for processing the situational cues, and the neuronal structures responsible for performing the behaviour, creates a neuronal connection between the two structures. The repeated co-activation of these structures over time leads to a strengthening of their connection such that activation of the cue processing structure leads to

an easy and fast co-activation of the behaviour structure. There is usually a direct relationship between the context (cue) and the behaviour.

Empirical research has supported the connectionist model. For example, Neal, Wood, Labrecque and Lally (2012) found that habitual runners responded quicker to target words associated with running (e.g., "running", "jogging"), compared with occasional- and non-runners, following subliminal priming of their typical running location (context). Further analysis showed there was no difference between groups when they were primed with their goal for running (e.g., "weight loss", "to stay healthy").

The context cues that can potentially activate habits are numerous in quantity and type. People, physical locations, times of day, mood, and preceding actions can all be triggers. The basic tenet here is associative learning; a link between actions with times, places, and the people that are typically present during the performance. Neal et al (2012) identified the powerful effect of context cues for controlling behaviour when they found that people who habitually ate popcorn at the cinema consumed significantly more stale popcorn that they reported to dislike, compared with occasional popcorn eaters.

The second approach to explaining habits focuses on behavioural scripts, which are developed through the repeated pairing of the situational cues and the behaviour. Scripts are memory structures that store the blueprint of the relevant behaviour; they contain the sequence of acts that are usually performed when a relevant situational cue is detected, and that have led to the successful achievement of the goal before (Verplanken & Aarts, 1999). From this perspective, goals are particularly important, as they are needed to activate the behaviour in the first instance. The script then takes over to guide the behaviour and the steps to reach the goal. From this perspective, habits are conceptualised as automatic links between goals and actions. Behaviour is goal-directed meaning that goals are often activated (deliberately) before activation of the behavioural script.

As well as individual behaviours, strong context-response associations can also guide socially acceptable behaviours and norms. From this perspective, the association is between the environment and normative behaviour. Aarts and Dijksterhuis (2003) found that when primed with a goal to visit a library, individuals talk more quietly. The goal of visiting the library elicits the behavioural script of being quiet. In contrast to the direct context-response associations proposed for individual habitual behaviours, they found that the relationship was mediated by the implicit activation of socially accepted behaviours in this context.

Despite proposing different associations, the connectionist approach and the script-based approach are not mutually exclusive: they could be conceived as complimentary models rather than contradictory, as follows. Goals are instrumental in our daily lives. They are critical in the initiation of an action in the first instance and for guiding subsequent performances – they tell people what to do and when to do it. As such, goals are inextricably linked to our daily routines, which have a large degree of stability in terms of context (e.g., locations, people, mood etc.). On a daily basis goals are likely to be activated in the same contexts and thus the behaviour associated with the goal, which develops through repeated co-activation, is also performed regularly in a stable context. As a consequence, the same behaviour also becomes paired with the context. For example, the goal of getting to work may activate the associated behaviour of driving a car. As this goal is typically activated at the same time each weekday morning (say, 8am), in the same location (e.g., as you're leaving home), the habit of driving may also become paired directly with the context so that every time you leave home early in the morning, you automatically use the car. The context cue primes an associated goal outside of conscious awareness (Bargh & Chartrand, 1999) so that a behaviour that was once goal directed can become triggered automatically by the context following repeated pairings of the goal in a stable context. In summary, Aarts et al's and Wood et al's perspectives share a large degree of similarity.

Both the connectionist approach and the script-based approach of habit suggest that established behaviours, through repeated performance, are performed automatically and relatively independently from beliefs and intentions. In this way habits are functional. They minimise the extent to which behaviour is dependent on effortful and intentional cognitive and behavioural resources. The direct cueing of context also means that once habits are established, behaviour bypasses intentions (Triandis, 1977; Ouellette & Wood, 1998; Verplanken et al, 1994). This is because a mental representation of the habitual behaviour is highly accessible to guide action. Neuroscience research suggests that as habits develop, there is a shift in activity from goal-orientated brain systems (e.g., pre-frontal cortex) to stimulus control systems such as the dorsolateral striatum (Yin & Knowlton, 2006). In other words, when behaviours are characterised by habits, they become "scripted" (Fujii & Garling, 2003) and are performed automatically in response to environmental cues, rather than guided by deliberate decision processes.

In support of this assertion, Danner et al (2008) found that people who cycle regularly had highly accessible representations of cycling, which were independent of their intentions to

cycle. In a different series of studies, they found that the mental accessibility of habits increases with repetition and results in an inhibition of alternative competitors (see Danner et al, 2007). In the latter research, Danner et al (2007) used a goal-response matching task to develop habits. Participants were shown goal-response pairings at different frequencies and were assessed on how quickly they responded with the correct (paired) or incorrect response following goal activation. The results showed that as habits developed (following frequent pairings) accessibility to the paired response was facilitated (as shown by faster reaction times) and access to competing responses was inhibited (as shown by a slower reaction time). These studies suggest that habits are highly accessible mental representations, which cause implicit inhibition of alternative responses and intentions. In other words, when behaviour is characterised by habit, individuals develop "tunnel vision" (Walker et al, 2014) and are less cognitively alert. In relation to environmental sustainability, this might manifest in them being less aware of their actions, the environmental impact that these have, and the alternative behaviours that are available.

The restriction that habits can place on awareness and behaviours might also have negative consequences on attempts to change behaviour. If individuals are unaware of their own behaviours and the alternative courses of action that are available, they might believe that they have no choice or ability to change their behaviour and develop negative thoughts in this regard (see Page & Page, 2014a).

The network of habits in thinking, affect, and behaviour, has significant implications for changing behaviour and the success of the techniques that are used to encourage behaviour change. Many established methods of behaviour change such as information provision, goal setting, and feedback, have developed from the perspective of bounded rationality and thereby assume that the acquisition of new information about behaviour and/or its alternatives will result in behaviour change. They seek to change cognitions and beliefs as a lever to change behaviour. This approach is unlikely to be effective when behaviours are characterised by habit and are performed automatically rather than as guided by intentions. There is, therefore, a need to reconsider the effectiveness of existing approaches towards behaviour change with the influence of habit properly considered, paying particular attention to how habits are created – new habit rehearsal – and also how they might be changed effectively – habit reversal.

5.2.2 Creating Habits – Habit Rehearsal

As previously discussed, there is a consensus that habit development is dependent on learning associations and shifting behavioural control from the person to the environment: from intentional to automatic processing. What is less well known, however, is the pathway of habit development and how quickly habits form to become automatically triggered actions, and whether different behaviours follow the same trajectory.

In relation to the purchase of environmentally friendly detergents, Dahlstrand and Biel (1997) identified seven key steps in the development of an environmentally benign habit. These were: (1) activation (i.e., attending to the environment as a value); (2) attending to present behaviour; (3) consideration of alternative behaviours; (4) planning new behaviour; (5) testing new behaviour; (6) evaluation of new behaviour; and (7) establishment of new habit. Alongside each of these steps, they postulated factors that could either impede or promote progress at that point. It is notable that the first of Dahlstrand and Biel's (1997) seven steps comes under the general heading of attentiveness and supports the notion that many people simply do not attend to, and are hence not aware of, their behaviour. This lack of awareness could certainly impede attempts to change behaviour, particularly as people under its influence might never progress to the latter stages of the new habit-forming process.

As well as theoretical modelling, there has also been more practical research on the trajectory of habit development (see Lally, van Jaarsveld, Potts & Wardle, 2010). Lally et al (2010) asked participants to develop a novel healthy eating or exercise behaviour into a habit. The criteria were that the behaviour could be triggered by a salient cue, which occurred once every day, e.g., drinking a bottle of water with lunch. The results showed that the automaticity of the behaviour, as measured by the Self-Report Habit Index (SRHI; Verplanken & Orbell, 2003), developed over the course of the study (following repetitions of the behaviour) in an asymptotic fashion. Typically, the automaticity of the behaviours reached a plateau at 66 days on average, although the range was 18-254 days. These empirical findings suggest that new habits can be developed by repeated cue-behaviour pairings but that a degree of self-control is required to persevere and reach automaticity.

5.2.3 Breaking Habits – Habit Reversal

If habit development is, at least, partially dependent on learning by repetition, then relearning should be a viable method for breaking habits. This might, for the reasons discussed previously, be easier said than done. The characteristics of habits make them resistant to change (Neal et

al, 2006) even when change is desirable (e.g., quitting smoking or losing weight) and potentially achievable in the short-term. People often fall back on their old habits and this is because the memory trace of a habit is often slow to change (Wood & Neal, 2009); it is protected from short-term variations and counter-habitual behaviours. Therefore, efforts to change established habits must persist over time, and this makes them dependent on personal resources of willpower and self-control.

5.2.3.1 Resources of willpower and self-control

People often use resources of willpower and self-control to behave counter habitually and persevere with change attempts, but both of these are limited in availability (Baumeister & Heatherton, 1996; Baumeister, Muraven & Tice, 2000), and weaken the more that they are called upon. Depletion of self-resources can make people more dependent on habit (Vohs, Baumeister & Ciarocco, 2005). Ironically, it is the resources of self-control and willpower that help in the formation of habits that can also hinder people's attempts to change. Thus, when trying to change, people can become further entrenched in their habits.

It seems that the methods people choose to control their habits have the potential to ingrain habitual behaviour even further. Quinn, Pascoe, Wood and Neal (2010) found that participants often choose vigilant monitoring techniques to control behaviour. This involves monitoring for the behaviour and inhibiting its response by actively thinking "don't do it". This technique was successful for some behaviours, but not all; it did not change habit strength and it was found to be dependent on resources of self-control. It appears, therefore, unsuitable for longer-term change attempts, and makes the individual vulnerable to the negative consequences of depleted resources such as preoccupied thinking (Polivy, 1998) and behavioural rebound (Wenzlaff & Wegner, 2000; Erskine, Georgiou & Kvavilashvili, 2010; Erskine & Georgiou, 2012). Similar consequences are also evident when implementation intentions are used, and often these too are ineffective at changing stronger habits (Webb & Sheeran, 2006; Webb, Sheeran & Luszczynska, 2009).

5.2.3.2 Context change

An alternative approach to changing habits, and one that is less reliant on levels of personal resource, is to change context cues. This method works by removing the triggers that cue behaviour so that people become 'free' to establish new patterns of behaviour away from competing habit cues (Davidov, 2007; Verplanken & Wood, 2006). In new contexts, people are able to consider deliberately what action to take because the automaticity of context cues has

been removed (Verplanken et al, 2008). This gives people the opportunity to search for new information and develop novel behaviours. Natural changes in circumstances, such as moving house or starting a new job, can provide welcome opportunities for habit change. Collectively, these are often called life course transitions. There is a growing body of empirical research that has explored the impact of life course transitions on everyday practices, including pro-environmental behaviour.

Wood, Tam and Guerrero Witt (2005) investigated the impact that context change has on disrupting habits and weakening habit strength. Participants in this study were students who were moving to a new university – a natural change in circumstance. They reported on their habits relating to exercising, reading the newspaper, and watching TV, 1-month before and 1-month after the transfer. Wood et al (2005) found that each of these habits was disrupted by the transfer but at different rates depending on the circumstantial changes perceived by the students, the actual changes in circumstance, and the strength of the habit. For example, location change had a greater effect on strong exercise habits compared with weak exercise habits. When students continued to exercise in the same location their habits remained strong, regardless of intentions, whereas, if they changed locations, their habit weakened. In contrast, location change had a minimal impact on weaker habits. This pattern of results was also observed for perceived changes in context. In summary, the change in location disrupted habits and brought behaviours under intentional control without overexertion of personal resources.

Similarly, Fuji and Gärling (2003) found that students changed their travel mode choice when they transferred from being a student to being employed. Likewise, Verplanken et al (2008) found that environmentally concerned employees who had recently moved residence used the car less often for their daily commute compared with employees who had not moved (see also Clark, Chatterjee, Melia, Knies & Laurie, 2014). As well as natural changes in behaviour, life course transitions also offer a suitable time point to implement a behaviour change intervention and intentionally change behaviour (Verplanken, 2014; Bamberg, 2006).

The habit discontinuity hypothesis (Verplanken et al, 2008), which accords with Verplanken and Wood's (2006) reasoning, explains these findings by suggesting that context changes, such as life course transitions, make people more attentive to their behaviour-related cognitions (e.g., beliefs, values, and norms), which 'frees' them to make new value-driven non-habitual choices and behaviours. A change in circumstance/context provides an opportunistic moment where the influence of existing context cues are weakened or diminished, and people are more able to reconsider alternative courses of action. Also, through context change, the direct cues

to behaviour are removed and people need to find alternative cues to direct action. These might be new external cues or if sufficiently strong, their internal values, beliefs, and cognitions.

Although life course transitions do offer a significant opportunity to change a variety of everyday behaviours, including those relating to pro-environmental activity, they might offer limited moments of change and opportunities to reconsider behaviour and undertake alternative courses of action. This is because such transitions are likely to occur just several times throughout an individual's life at most, and probably during fixed time periods when these transitions occur naturally (see Page & Page, 2014b). It is proposed, therefore, that more regular and structured disruption to daily patterns of behaviour might be more suitable and effective. This proposal of an intervention of regular habit reversal and new habit rehearsal will be discussed further in Chapter 7 with reference to the Do Something Different technique. The remainder of this Chapter presents an empirical study (Study 5) that explores the habit characteristics and determinants of a range of pro-environmental behaviours in order to better understand the extent to which pro-environmental behaviours differ in their habit characteristics. It is hoped that this will give some insight into the most effective ways of developing pro-environmental habits in individuals who are, at present, less environmentally friendly in their approach.

5.3 Study 5

5.3.1 Method

Following on from the previous studies in this programme of research, this study explored, and compared and contrasted, the factors believed to influence a range of pro-environmental behaviours to elucidate further the role of habit in pro-environmental activity. It explored the habit characteristics of several everyday pro-environmental behaviours using an established measure – the Self-Report Habit Index (SRHI; Verplanken & Orbell, 2003), and also explored the role of personal FITness and its relationship to the habit characteristics and perceived triggers of behaviour. To consider the overall habitualness of lifestyles, the study also explored individuals' preference for routine in day-to-day life, and the extent to which general daily behaviours were performed frequently and perceived as habits.

5.3.1.1 Objectives and Hypotheses

The objectives for Study 5 were to explore the following research questions and hypotheses:

Q1. To explore individuals' preference for routine and the presence of habits in day-to-day behaviour. Do participants perceive a range of everyday activities as habits, and are the behaviours that are perceived as strong habits performed more frequently?

> H_{5a}: There will be a positive relationship between the strength of an individual's overall preference for routine and the perceived habit strength of daily behaviours and how frequently these behaviours are performed.

Q2. To explore and compare and contrast the habit profiles of a range pro-environmental behaviours.

> H_{5b}: It is expected that the habit profiles (repetition, difficulty controlling behaviour/automaticity, lack of awareness, efficiency, and identity) of different pro-environmental behaviours (as measured by the SRHI) will differ from each other.
>
> H_{5c}: The overall habit strength of pro-environmental behaviours (as measured by the SRHI) will relate to preference for routine. Individuals with a higher preference for routine in daily living will have stronger pro-environmental behaviour habits.

Q3. To explore the relationship between strength of habit/habit characteristics and FIT variables.

> H_{5d}: It is expected that there will be a relationship between the habit characteristics of pro-environmental behaviours (as measured by the SRHI) and FIT variables.

Q4. To identify the intrinsic and extrinsic factors that are perceived to influence performance of pro-environmental behaviours, and explore their perceived strength of influence according to level of FITness.

> H_{5e}: The factors that are perceived to influence pro-environmental activity will differ according to the pro-environmental behaviour.
>
> H_{5f}: The factors that are perceived to influence pro-environmental behaviour will differ according to level of FITness. It is expected that for individuals with higher levels of FITness, intrinsic factors will be perceived to have a stronger influence on pro-environmental behaviour. For individuals with lower levels of FITness, extrinsic factors will be perceived to have a stronger influence on behaviour.

Q5. To identify the intrinsic and extrinsic factors that are perceived to influence performance of pro-environmental behaviours, and explore their strength of influence according to the strength of habit for each pro-environmental behaviour.

H_{5g}: It is expected that individuals will perceive intrinsic factors to have a stronger influence on pro-environmental behaviours that have weaker habit profiles and that extrinsic factors will be perceived to have a greater influence on pro-environmental behaviours that have stronger habit profiles.

5.3.2 Respondents

There were N = 95 respondents in the sample, of whom n = 26 (27%) were male and n = 45 (47%) were female, and n = 24 (25%) did not report their gender. The age distribution of respondents was positively skewed with the majority of respondents aged below 30 years (M = 24.17, SD = 7.34). No participant was older than 60 years. Regarding ethnicity, respondents classified themselves as follows: n = 10 (11%) 'White Caucasian'; n = 30 (32%) 'Asian'; n = 23 (24%) 'Black'; n = 4 (4%) 'Mixed race'; and n = 4 (4%) 'Other'. Regarding employment status, n = 17 (18%) respondents were employed; n = 6 (6%) respondents were unemployed; and n = 48 (50%) were students. When asked about their awareness of an environmental policy in their place of work or study, n = 36 (38%) reported they were aware of a policy; n = 5 (5%) reported that they didn't have a policy; n = 25 (26%) were unsure; and n = 5 (5%) reported 'n/a'. Twenty-five respondents (25%) did not report any demographic or lifestyle characteristics.

Two methods of data collection were used to recruit respondents to the research. The first used an online research participation system available to students at the University of Hertfordshire. An advert describing the study and participation requirements was posted on the site alongside a link to the online survey. Student respondents completed the questionnaire as part of the research requirements of their course. The second method of data collection involved the researcher sending an email to their network of acquaintances (including friends, family and colleagues) that described the study and included a link to the online survey. In the email, respondents were asked if they would be willing to participate in a research study on everyday habits and routines by completing an online questionnaire. A snowballing method was used and respondents were encouraged to forward the email and distribute the study information to their own network of friends and family. All respondents were volunteers to the research and formed an opportunity sample.

Due to the opportunistic approach to data collection, it was not possible to ascertain whether any of the participants in this study had taken part in any of the prior studies in this programme of research. However, given the time-delay between the studies, it is unlikely that the same participants, especially the student participants, were available to participate on more than one

occasion; many of the students would have graduated prior to this study being advertised and made available online.

Ethical approval was sought and granted from the Psychology Ethics Committee at the University of Hertfordshire prior to data collection (ethics approval code: PSY/01/11/KM).

5.3.3 Materials

The data were collected using an online questionnaire composed of several scales described as follows (see Appendix D).

5.3.3.1 Life activities scales

The first section of the questionnaire measured respondents' general daily life activities. There were two scales in this section of the questionnaire. The first measured the extent to which participants perceived their daily behaviours as a habit, and the second measured their perception of how frequently they performed the behaviour. The ten items in these two scales were identical and they included behaviours that respondents could engage with on a fairly routine basis and regularly as a part of their daily routine. They included, amongst others, watching TV, listening to music, exercising, and checking emails. Each item was measured twice, firstly according to how much the behavioural activity was perceived as a habit, and secondly, according to how frequently respondents performed the behaviour. Both the 'habit' and 'frequency' measures were assessed on 5-point Likert scales ranging from 1 (*I don't do*) to 5 (*a strong habit*), and 1 (*never*) to 5 (*more than once a day*), respectively. The total scores on both scales ranged from 10 to 50, with higher scores indicating the behaviour as a stronger habit and performed with greater frequency, respectively.

5.3.3.2 Preference for routine

This scale was designed to measure respondents' preference for routine in daily living, in order to get an overall perspective on the extent to which respondents felt comfortable following the same patterns of behaviour on a daily basis. The scale contained twelve items that reflected different aspects of planning and routinisation, for example, 'do you like to have your days planned?' and 'do you stick to the same routine when getting ready in the morning?' The items were measured on a 5-point Likert scale, 1 (*very rarely*) to 5 (*most of the time*). The total scale scores ranged from 12 to 60 with higher total scores indicating a stronger preference for routine.

5.3.3.3 Self-Report Habit Index

The Self-Report Habit Index (SRHI; Verplanken & Orbell, 2003) was used to measure the habit strength and characteristics of seven different pro-environmental behaviours, independent of behavioural frequency. The pro-environmental behaviours were: recycling materials; turning lights off; turning taps off; turning electrical equipment off after use; walking, cycling or using public transport rather than the car; car-pooling/sharing; and recycling equipment. Each pro-environmental behaviour was measured on the 12 items of SRHI scale. The items of the SRHI measure the psychological constructs that have been shown as characteristic of habits. These are: a history of repetition of behaviour; difficulty controlling behaviour; lack of awareness of behaviour; efficiency; and identity – how much respondents see the behaviour as being part of them. The items were measured on a 7-point Likert scale, 1 (*agree*) to 7 (*disagree*). The total scale scores ranged from 12 to 84 with a higher total score indicating stronger habitual tendencies. The scale has shown good psychometric properties (see Verplanken & Orbell, 2003) and has been used extensively as a psychological measure of habit (Gardner, 2012).

5.3.3.4 Pro-environmental behaviour ranking scales

The seven pro-environmental behaviours measured by the SRHI were also measured on a ranking scale in order to identify the factors that are perceived to influence their performance. The ranking scales were adapted from the home and work energy scales developed in Study 3 and tested empirically in Study 4. Each scale listed nine factors (developed from the results of Study 3 and Study 4) that could influence the extent to which respondents engaged with the pro-environmental behaviour. The scales contained intrinsic and extrinsic factors that could influence behaviour. The scale items were identical for the pro-environmental behaviours to allow comparisons to be made between them. Respondents were asked to rank order the nine items according to how much each factor influenced their ability to perform the behaviour. As per Study 3 and Study 4, respondents were instructed to rank the item that was perceived as the most influential/important as 1, the next most important item was ranked as 2, and so on until all nine items had been placed in order. The scales were designed so that respondents could use each ranking position only once, and could not have equal rankings.

5.3.3.5 The FIT Profiler – short form

The shortened version of The FIT Profiler (Fletcher & Stead, 2000), as developed by Page and Fletcher (2006), was used to measure the cognitive and behaviour dimensions of FIT. As FIT variables have been described previously, a detailed description will not be repeated here. The

Cognitive Constancies of Awareness, Balance, Conscience, Fearlessness, and Self-responsibility, as well as Behavioural Flexibility, were measured. Again, the total FIT Integrity and Behavioural Flexibility scores were scaled to 100 for convenience (see Chapters 3 and 4 for a more detailed description of the FIT scales used).

5.3.3.6 Demographic and lifestyle questions

Demographic and lifestyle data were collected to inform the characteristics of the sample. This included questions on: gender; age; ethnicity; employment status, and the presence of an environmental policy in the workplace. All questions were categorical and were coded nominally or ordinally according to the number of categories.

5.3.4 Procedure

All data were collected electronically using an online survey platform. The questionnaire pack contained detailed instructions on the purpose of the study and how to complete the different scales, and although they were not uncomplicated, responses suggest that respondents had understood the instructions. At the close of the survey the data were downloaded to Excel and then exported to SPSS for analysis.

5.3.5 Data Preparation

There were 159 respondents in the raw data file downloaded from the online survey system. Further inspection of the data showed that 95 respondents completed the survey in full resulting in a 60% completion rate. Again, due to the free availability of the questionnaire on the Internet and the possibility that non-completers might return to the questionnaire at a later date, incomplete data sets were removed. Therefore, the sample used in this analysis contains $N = 95$ respondents.

5.4 Results

5.4.1 Descriptive Statistics

The means, standard deviations, skewness, kurtosis, and other descriptive statistics for the Life Activities Habit and Frequency scales, Preference for Routine, and the FIT Profiler scales are displayed in Table 5.1. Scores on both the Life Activities Habit and Frequency scales were distributed evenly. The Life Activities Habit scores showed no grave deviations from a normal distribution however, the Life Activities Frequency scores were much more peaked than a normal distribution. To accommodate this deviation from normality, inferential analyses conducted on this scale were non-parametric. The mean scores on each scale were located just

above the scale mid-point suggesting that the behaviours in the scale were indeed activities that respondents performed regularly in their day-to-day lives, and they could be conceived as habits. There was only a small difference between the means for both scales. This suggests that the perceptions of habits and behaviour frequency correspond.

The Preference for Routine scores distributed to the upper- but not the lower-end of the scale, and the mean score approximated the mid-point. These findings suggested that all respondents in the sample had at least a weak preference for routine. There was, however, a large degree of variability in the scores suggesting that some respondents were more rigid in their daily routine compared with others.

Table 5.1. Study 5 – Descriptive statistics for the Life Activities habit and frequency scales, Preference for Routine scale, and FIT Profiler scales (*N* = 95)

				95% CI							
Scale	α	*M*	*SE*	LL	UL	*Mdn*	Min.	Max.	*SD*	Skewness	Kurtosis
LA Habit	.61	33.03	.59	31.87	34.19	34.00	20.00	45.00	5.71	-.24	-.46
LA Frequency	.54	35.25	.46	34.34	36.16	36.00	14.00	45.00	4.48	-1.49	5.32
Preference for routine	.53	37.24	.58	36.10	38.40	37.00	25.00	53.00	5.66	.23	.33
Integrity	.59	56.38	1.78	52.84	59.91	54.00	16.00	100.00	17.35	.40	.17
Awareness	-	7.15	.25	6.65	7.65	8.00	1.00	10.00	2.45	-.74	-.59
Balance	-	3.79	.31	3.16	4.42	3.00	0.00	10.00	3.07	.62	-.74
Conscience	-	6.14	.30	5.54	6.73	6.00	0.00	10.00	2.92	-.16	-1.19
Fearlessness	-	4.07	.32	3.44	4.70	3.00	0.00	10.00	3.09	.50	-.97
Self-responsibility	-	7.04	.25	6.54	7.54	8.00	0.00	10.00	2.45	-.97	.37
Behavioural Flexibility	.87	17.67	1.45	14.78	20.56	15.00	1.00	51.67	14.17	.61	-.47

Note. LA Habit = Life Activities Habit; LA Frequency = Life Activities Frequency.

LL = lower limit for 95% Confidence Interval; UL = upper limit for 95% Confidence Interval.

Scores for the FIT Profiler variables were similar to those observed in previous studies. Again, FIT Integrity scores were moderate and Behavioural Flexibility scores were low, with the maximum score reaching only the mid-point of the scale. The individual Constancy scores were highest for Awareness, Conscience, and Self-responsibility, and distributed to both the lower- and upper-ends of the scale. Levels of Balance and Fearlessness were lower.

With regard to the alpha coefficients, these were lower than recommended (.70) for all bar the Behavioural Flexibility scale. This finding is noted here but no effort is made to refine the scales and improve their reliability, as this was not the purpose of the study. Higher levels of reliability have been found in other studies.

5.4.1.1 Self-Report Habit Index scales

The descriptive statistics for the total SRHI scores for the pro-environmental behaviours are displayed in Table 5.2. The mean scores show that the behaviours differ in the strength of their habit characteristics; 'turning taps off' was scored as the strongest habit and 'recycling equipment' was scored as the weakest habit. The mean score for 'recycling materials' such as paper and cardboard was lower than expected, and not much higher than the mean score for 'car-pooling/sharing'. The scores for all items distributed to the upper-end of the theoretical scale and in most cases to the lower-end too. Scores for 'turning taps off' were negatively skewed and peaked. The Cronbach's alpha values exceeded the recommended benchmark of 0.7.

Table 5.2. Study 5 – Descriptive statistics for the total SRHI scores for individual pro-environmental behaviours (*N* = 95)

				95% CI							
Scale	α	*M*	*SE*	LL	UL	*Mdn*	Min.	Max.	*SD*	Skewness	Kurtosis
Recycling materials	.95	47.93	2.06	43.85	52.02	48.00	12.00	84.00	20.06	-.12	-.77
Turning lights off	.92	66.89	1.62	63.67	70.11	69.00	12.00	84.00	15.81	-1.19	1.60
Turning taps off	.90	76.94	1.11	74.72	79.17	82.00	28.00	84.00	10.91	-2.14	5.10
Turning off electrical equipment	.95	68.22	1.72	64.81	71.63	72.00	20.00	84.00	16.73	-.96	.10
Walking, cycling or public transport	.96	52.00	2.36	47.31	56.68	54.00	12.00	84.00	22.99	-.39	-1.01
Car-pooling/sharing	.97	45.01	2.43	40.17	49.85	43.00	12.00	84.00	23.74	.26	-1.10
Recycling equipment	.98	39.05	2.48	34.14	43.97	35.00	12.00	84.00	24.13	.56	-.94

LL = lower limit for 95% Confidence Interval; UL = upper limit for 95% Confidence Interval.

The descriptive statistics suggest that the habit strength of different pro-environmental behaviours varies. The magnitude of the differences, and the habit characteristics of each pro-environmental behaviour, was explored further.

5.4.2 Intercorrelations

This analysis explored the relationships amongst the variables as shown by their intercorrelations. The Pearson's and Spearman's correlations are displayed in Table 5.3. There were some notable relationships. Scores on the Life Activities Frequency and Life Activities Habit scales were positively correlated. The Life Activities Habit scores were positively related to the Behavioural Flexibility scores but negatively correlated to FIT Integrity. In relation to the different pro-environmental behaviours, there were no notable relationships between Life Activities Frequency and the SRHI scores of the different pro-environmental behaviours.

In summary, these results suggest that the habit strength of pro-environmental behaviours is largely unrelated to general habits and preference for routine in day-to-day life. The relationships with FIT variables might suggest that individuals with higher levels of Behavioural Flexibility have a larger repertoire of behaviours overall. In other words, they simply do more things.

There were significant and positive relationships between those pro-environmental behaviours that related to the same type of activity, e.g., curtailment behaviours – 'turning lights off', 'turning taps off', 'turning electrical equipment off'. This suggests that if an individual is in the habit of performing one of these behaviours, they are also likely to perform the others. In other words, there is a spillover across pro-environmental behaviours. Similarly, there was also a positive relationship between the recycling behaviours ('recycling materials' and 'recycling equipment') and the pro-environmental behaviours relating to travel mode choice ('walking, cycling or using public transport' and 'car-pooling/sharing').

The correlation results suggest that the Life Activities Habit scale might measure behavioural occurrence or size of behavioural repertoire rather than the habit characteristics of behaviours. The null relationships with the pro-environmental behaviours measured on the SRHI scales suggest that the scales are measuring distinct constructs.

There was only one statistically reliable relationship between FITness and pro-environmental behaviour habits (as measured by the SRHI), and this was between FIT Integrity and 'recycling equipment'. Of all the pro-environmental behaviours included in the scale, 'recycling equipment' was reported to be performed less frequently and therefore have weaker habit

characteristics. It is, therefore, interesting, that FIT Integrity held a positive and statistically significant relationship with this pro-environmental behaviour. This might suggest that FIT variables support the performance of pro-environmental behaviours that are weaker habits.

Table 5.3. Study 5 – Intercorrelations amongst the study variables (*N* = 95)

	1	2[a]	3	4	5	6	7	8	9	10	11
1. LA Habit	-										
2. LA Frequency	.55*	-									
3. Preference for routine	.05	.20	-								
4. Recycling materials	-.02	.07	.02	-							
5. Turning lights off	.02	-.15	-.05	.05	-						
6. Turning taps off	.05	-.09	.08	-.04	.36**	-					
7. Turning off electrical equipment	-.07	.03	.12	.04	.37**	.37**	-				
8. Walking, cycling or using public transport	.04	-.06	-.25*	.06	-.01	-.11	-.17	-			
9. Car-pooling/sharing	-.11	-.12	-.18	-.09	.11	.004	.05	.35**	-		
10. Recycling equipment	-.09	-.13	-.17	.28**	.11	-.04	.26**	.10	.26*	-	
11. FIT Integrity	-.33**	-.16	-.13	-.09	.05	.04	.03	.06	.18	.21*	-
12. Behavioural Flexibility	.24*	.04	-.10	-.004	-.10	-.13	-.12	.17	.04	-.20	-.06

Note. LA Habit = Life Activities Habits; LA Frequency = Life Activities Frequency.
*$p < .05$. **$p < .01$.

[a] = Spearman's correlation.

Following the statistically significant relationship between FIT Integrity and the total habit score for the pro-environmental behaviour 'recycling equipment', further analyses were conducted on the habit sub-scales (repetition, difficulty controlling behaviour, lack of awareness, and self-identity) for this behaviour. There were statistically significant relationships between FIT Integrity and difficulty controlling behaviour ($r = .21$, $p < .05$), lack of awareness ($r = .22$, $p < .05$) and self-identity ($r = .21$, $p < .05$). These results suggest that individuals with higher levels of FIT Integrity have greater difficulty controlling the behaviour, are less aware of its performance, and have a stronger sense of self-identity with the behaviour (see Table 5.4).

Table 5.4. Study 5 – The relationship between FIT variables and the habit characteristics for each pro-environmental behaviour

Pro-environmental behaviour	FIT variable	Habit Characteristic			
		Repetition	Difficulty controlling behaviour	Lack of awareness	Self-identity
Recycling materials	Integrity	-.03	-.10	-.14	-.06
	B-Flex	.08	-.07	.04	-.03
Turning lights off	Integrity	-.01	.09	.04	.04
	B-Flex	.12	-.21*	-.13	-.08
Turning taps off	Integrity	.07	.04	-.04	.08
	B-Flex	.02	-.23*	-.09	-.07
Turning off electrical equipment	Integrity	.06	.02	.02	.05
	B-Flex	.02	-.13	-.14	-.09
Walking, cycling or using public transport	Integrity	.09	.08	.04	.04
	B-Flex	.18	.08	.16	.22*
Car pooling	Integrity	.14	.21*	.14	.18
	B-Flex	.07	-.02	.03	.03
Recycling equipment	Integrity	.17	.21*	.22*	.21*
	B-Flex	-.15	-.22*	-.16	-.22*

*$p < .05$. **$p < .01$.

5.4.3 Exploring the Habit Characteristics of Pro-environmental Behaviours

The SRHI measures the habit characteristics of behaviour based on the theoretical characteristics of habit: history of repetition; difficulty controlling the behaviour; lack of awareness; and identity. To assess the similarities and potential differences between the habit characteristics of different pro-environmental behaviours, Table 5.5 presents descriptive statistics for the pro-environmental behaviours in each of the aforementioned categories. The data shown are mean item scores.

The total means for each habit characteristic suggest that overall, pro-environmental behaviours were most strongly characterised by 'repetition' and then 'self-identify' and less so by 'difficulty controlling behaviour' and 'lack of awareness'. The differences in the total strength of each habit characteristic across the different pro-environmental behaviours were found to be statistically significant according to a one-way repeated-measures ANOVA, $F(2.35, 220.74) = 59.14$, $p < .01$, *partial eta squared* = .39. Follow-up pairwise comparisons (Bonferroni adjusted, $p < .008$) showed that, statistically, 'repetition' was the strongest habit characteristic

compared with all others (all comparisons $p < .01$), 'difficulty controlling behaviour' was the weakest characteristic compared with all others (weaker than 'lack of awareness' ($p = .002$) and 'self-identity' ($p = .003$)), but there was no difference between 'lack of awareness' and 'self-identity' ($p = .81$). These results suggest that 'repetition' was the strongest habit characteristic of the different pro-environmental behaviours and 'difficulty controlling behaviour' was the weakest characteristic. The habit characteristics of 'lack of awareness' and 'self-identity' appear to have a similar strength.

Further analyses were conducted to explore separately the habit profiles for the different pro-environmental behaviours. The mean item scores for the pro-environmental behaviours suggest that they each have a different habit profile. For example, for the pro-environmental behaviour recycling materials, 'repetition' was the strongest habit characteristic followed by 'self-identity', then 'difficulty controlling behaviour' and then 'lack of awareness'. One-way repeated-measures ANOVAs (see Table 5.6) were conducted to explore the differences and similarities in the habit profiles for each pro-environmental behaviour. The omnibus ANOVA results proved significant for each behaviour. Follow-up pairwise comparisons were conducted separately to identify the specific habit profiles for each behaviour (Bonferroni adjusted for multiple comparisons, $p < .008$).

'Repetition' was the strongest characteristic for all of the pro-environmental behaviours. For the pro-environmental behaviour of 'recycling materials', 'difficulty controlling behaviour' was also found to be stronger than 'self-identity'. The habit characteristic of 'lack of awareness' was found to be the second strongest characteristic for the pro-environmental behaviours 'turning taps off' and 'walking, cycling or using public transport'. The habit characteristic of 'self-identity' was also more important than 'difficulty controlling behaviour' for the pro-environmental behaviour of 'walking, cycling or using public transport'. There were no other significant differences.

In summary, there was a large degree of similarity in the habit profiles of the different pro-environmental behaviours. The habit characteristic of 'repetition' was the strongest characteristic for all pro-environmental behaviours. The habit characteristic of 'lack of awareness' had a stronger influence on curtailment pro-environmental behaviours such as 'turning lights off', 'turning taps off' and 'turning off electrical equipment' whereas the habit characteristic of 'self-identity' had a stronger influence on the travel mode choice and recycling behaviours.

Table 5.5. Study 5 – Habit characteristics of pro-environmental behaviours. The data shown for the behaviours are mean item scores (*N* = 95)

Habit characteristic	SRHI Item	Recycling materials	Turning lights off	Turning taps off	Turning off electrical equipment	Walking, cycling or public transport	Car-pooling	Recycling equipment	Total
Repetition	I do frequently	5.02 (2.09)	6.59 (1.04)	6.84 (0.70)	6.48 (1.12)	5.27 (2.32)	4.63 (2.38)	3.68 (2.42)	38.53 (5.65)
	I have been doing for a long time	4.33 (2.16)	5.97 (1.61)	6.55 (1.06)	6.04 (1.30)	4.93 (2.27)	3.84 (2.34)	3.32 (2.17)	34.97 (5.99)
	Total repetition	4.67 (1.96)	6.28 (1.23)	6.69 (0.79)	6.26 (1.08)	5.10 (2.18)	4.24 (2.20)	3.50 (2.19)	36.75 (5.31)
Difficulty controlling behaviour	I do automatically	4.27 (2.12)	6.41 (1.12)	6.83 (0.52)	6.16 (1.46)	4.61 (2.31)	4.14 (2.31)	3.40 (2.24)	35.82 (5.72)
	That would require effort not to do it	3.29 (1.97)	4.56 (2.15)	5.63 (1.99)	5.11 (2.06)	3.64 (2.35)	3.27 (2.18)	3.03 (2.14)	28.54 (8.83)
	I would find hard not to do	3.39 (2.06)	4.85 (2.25)	6.06 (1.74)	5.18 (2.07)	3.59 (2.25)	3.38 (2.24)	3.19 (2.13)	29.64 (8.41)
	Total difficulty	3.65 (1.70)	5.27 (1.54)	6.17 (1.24)	5.48 (1.62)	3.95 (1.99)	3.60 (2.02)	3.21 (2.04)	31.33(6.53)
Lack of awareness	I do without having to consciously remember	3.93 (2.12)	5.88 (1.56)	6.59 (0.95)	5.77 (1.61)	4.45 (2.30)	3.77 (2.25)	3.77 (2.25)	33.69 (5.93)
	I do without thinking	3.79 (2.07)	5.56 (1.84)	6.46 (1.29)	5.61 (1.65)	4.16 (2.32)	3.49 (2.16)	3.49 (2.16)	32.25 (6.60)
	I start doing before I realize I'm doing it	3.83 (2.07)	5.34 (1.99)	6.36 (1.41)	5.49 (1.83)	4.26 (2.39)	3.56 (2.36)	3.56 (2.36)	31.83 (6.98)
	I have no need to think about doing	4.03 (2.11)	5.46 (1.91)	6.47 (1.09)	5.58 (1.77)	4.11 (2.23)	3.68 (2.31)	3.68 (2.31)	32.52 (6.97)
	Total awareness	3.93 (1.77)	5.56 (1.59)	6.47 (0.99)	5.61 (1.59)	4.27 (2.09)	3.67 (2.11)	3.16 (2.05)	32.68 (6.08)
Self-identity	That makes me feel weird if I do not do it	3.60 (2.20)	5.22 (2.01)	6.15 (1.56)	5.43 (1.97)	3.58 (2.25)	3.60 (2.21)	3.34 (2.11)	30.92 (7.78)
	That belongs to my (daily, weekly, monthly) routine	4.22 (2.03)	5.37 (2.00)	6.43 (1.29)	5.62 (1.76)	4.69 (2.38)	3.61 (2.38)	3.02 (2.17)	32.96 (7.00)
	That's typically me	4.23 (2.10)	5.68 (1.67)	6.57 (0.95)	5.75 (1.66)	4.71 (2.27)	4.03 (2.35)	3.42 (2.19)	34.39(6.72)
	Total self-identity	4.02 (1.87)	5.42 (1.55)	6.38 (1.03)	5.60 (1.59)	4.33 (1.95)	3.75 (2.04)	3.26 (2.02)	32.76 (6.13)

Table 5.6. Study 5 – One-way repeated measures ANOVAs and pairwise comparisons (Bonferroni adjusted) for the habit characteristics of the different pro-environmental behaviours (*N* = 95)

		Recycling materials	Turning lights off	Turning taps off	Turning off electrical equipment	Walking, cycling or using public transport	Car-pooling	Recycling equipment
F		25.32**	26.88**	12.98**	23.27**	31.10**	12.80**	7.18**
1 v	2	1.02***	1.00***	0.52***	0.78***	1.15***	0.64***	0.29**
	3	0.74***	0.72***	0.22***	0.65***	0.83***	0.57***	0.34***
	4	0.66***	0.85***	0.32***	0.66***	0.77***	0.49**	0.24**
2 v	3	-0.28	-0.29	-0.30*	-0.13	-0.33*	-0.07	0.05
	4	0.36***	-0.15	-0.21	-0.12	-0.38**	-0.15	-0.05
3 v	4	-0.09	0.14	0.09	0.04	-0.05	-0.08	-0.10

Note. 1 = Repetition; 2 = Difficulty controlling behaviour; 3 = Lack of awareness; 4 = Self-identity.

*p < .05. **p < .01. ***p < .008 (Bonferroni corrected).

5.4.4 Exploring the Perceived Influence of Intrinsic and Extrinsic Factors on Pro-environmental Behaviours

Following on from Study 3 and Study 4, this analysis explored the factors that are perceived to influence performance of a range of pro-environmental behaviours. The data used in these analyses were in the form of numerical ranks and were analysed with non-parametric statistical tests. Table 5.7 presents the mean and median rank and standard deviation for each of the seven pro-environmental behaviours. As the factor perceived as the most influential factor was ranked as 1 and the factor perceived as the least influential factor was ranked as 9, lower mean and median scores show the factor had a stronger perceived influence on behaviour.

The mean and median ranks show that 'my sense of social responsibility' was consistently perceived as the most influential factor for all-bar-one of the pro-environmental behaviours – 'car-pooling/sharing' was the exception, where it was positioned as the second most influential factor. The factor perceived as the second most influential factor for five out of the seven pro-environmental behaviours was 'the attitudes and behaviour of my friends and family' – this was also perceived as the most influential factor for 'car-pooling/sharing' and perceived as the third most influential factor for 'recycling materials'. These results suggest two things: firstly, that there is a large degree of similarity in the factors that are perceived to influence different pro-

environmental behaviours and; secondly, alongside an individual's sense of personal responsibility, the perceived influence of other people and social norms is noticeable.

At the other end of the scale, 'government and local authorities leading by example' was ranked as the least important factor for all of the pro-environmental behaviours. 'My belief in the reality of climate change' and 'clear and practical information' were also perceived as less influential compared with the other factors.

The profiles for most of the pro-environmental behaviours were similar. The acts of 'recycling materials' and 'recycling equipment' appeared to have profiles that were more differentiated compared with the other behaviours. For 'recycling materials', an individual's belief in the need to recycle was more influential for this behaviour compared with other actions, it was positioned as the second most important factor whereas it was ranked as lower (5^{th}, 6^{th} and 7^{th}) for other pro-environmental behaviours. In contrast, 'my willingness to change my lifestyle' was ranked as less important for 'recycling materials' compared with other behaviours. It was ranked in 7^{th} position, lower than its ranking for other behaviours (3^{rd} and 4^{th}). This might suggest that recycling materials is a behaviour that individuals have already embedded in their lifestyle.

The profile for 'recycling equipment' shows that 'clear and practical information' was perceived to have a stronger influence on this behaviour compared with all others. It was ranked in 4^{th} position, higher than its rank for the other behaviours (6^{th}, 7^{th}, and 8^{th}). In contrast, 'believing my actions will make a difference' was ranked in 7^{th} position for 'recycling equipment'. This is lower than its position for all other pro-environmental behaviours. The results for this pro-environmental behaviour suggest that it has a different profile to most of the other pro-environment behaviours that were measured. The higher position for 'clear and practical information' might suggest that individuals need more guidance on how to perform this behaviour.

In summary, the results suggest that there is a large degree of similarity in the factors that are perceived to influence different pro-environmental behaviours. A personal sense of social responsibility and the attitudes and behaviours of friends and family were perceived to have the strongest influence on behaviours, whereas good role models, and personal beliefs about the reality of climate change, were perceived to have a weaker influence. The exceptions to these profiles appear to be recycling behaviours.

Table 5.7. Study 5 – Descriptive statistics for the perceived influence on each of the pro-environmental behaviours (*N* = 95)

	Recycling materials			Turning lights off			Turning taps off			Turning off electrical equipment			Walking, cycling or public transport			Car-pooling/sharing			Recycling equipment		
	M	*Mdn*	Rank	*M*	*Mdn*	Rank	*M*	*Mdn*	Rank	*M*	*Mdn*	Rank	*M*	*Mdn*	Rank	*M*	*Mdn*	Rank	*M*	*Mdn*	Rank
Scale item	(*SD*)			(*SD*)			(*SD*)			(*SD*)			(*SD*)			(*SD*)			(*SD*)		
The attitudes and behaviour of my friends and family	4.55 (3.03)	4.00	3	3.81 (3.12)	2.00	2	3.72 (2.93)	3.00	2	3.76 (3.12)	2.00	2	4.24 (3.14)	3.00	2	3.43 (3.04)	2.00	1	4.08 (3.29)	3.00	2
My sense of social responsibility	3.85 (2.11)	4.00	1	3.58 (2.33)	3.00	1	3.41 (2.40)	2.00	1	3.27 (2.34)	2.00	1	4.20 (2.52)	3.00	1	3.82 (2.50)	2.00	2	3.91 (2.48)	3.00	1
My belief that climate change in man-made	4.75 (2.58)	4.00	5	5.38 (2.33)	5.00	6	4.76 (2.33)	4.00	4	4.97 (2.27)	5.00	5	5.22 (2.32)	5.00	6	4.96 (2.29)	4.00	4	5.11 (2.36)	5.00	5
My willingness to change my lifestyle	5.52 (2.31)	6.00	7	4.76 (2.04)	4.00	4	4.53 (1.89)	4.00	3	4.84 (2.04)	4.00	4	4.43 (2.10)	4.00	3	4.56 (1.83)	4.00	3	4.71 (1.90)	4.00	3
Clear and practical information	5.21 (2.42)	5.00	6	5.93 (2.15)	6.00	8	5.43 (1.97)	5.00	7	5.83 (2.04)	5.00	8	5.57 (2.10)	5.00	8	5.55 (2.12)	5.00	8	4.96 (2.10)	5.00	4
My belief that there is a need to…	4.43 (2.82)	4.00	2	5.02 (2.01)	5.00	5	5.37 (1.93)	6.00	6	5.38 (1.80)	6.00	6	4.98 (1.91)	5.00	5	5.54 (1.89)	6.00	7	5.15 (1.91)	5.00	6
My belief in the reality of climate change	5.62 (2.25)	6.00	8	5.49 (2.13)	6.00	7	5.64 (2.11)	6.00	8	5.57 (2.05)	6.00	7	5.51 (2.22)	6.00	7	5.35 (1.97)	6.00	6	5.53 (2.20)	6.00	8
Government and local authorities leading by example	6.39 (2.61)	7.00	9	6.79 (2.36)	8.00	9	6.96 (2.49)	8.00	9	6.73 (2.56)	8.00	9	6.20 (2.84)	8.00	9	6.79 (2.56)	8.00	9	6.23 (2.85)	8.00	9
Believing my actions will make a difference	4.68 (2.72)	4.00	4	4.24 (2.92)	3.00	3	5.19 (3.14)	5.00	5	4.66 (3.01)	4.00	3	4.65 (3.19)	4.00	4	5.01 (3.16)	5.00	5	5.34 (3.06)	6.00	7

5.4.5 Exploring the Effect of FITness on the Determinants of Pro-environmental Behaviours

Study 4 showed that the factors that are perceived to influence energy saving differ according to level of personal FITness; the behaviours of individuals with lower FIT scores showed a stronger relationship with extrinsic factors in the environment rather than those intrinsic to the individual, and as such, they might offer a greater potential for disruption due to a change in context or circumstance. Following on, this analysis explored whether a similar pattern of results was evident across a range of pro-environmental behaviours, and whether there were any differences according to levels of FIT Integrity (see Table 5.8 and Table 5.9) and Behavioural Flexibility (see Table 5.10 and Table 5.11). Due to the number of comparisons being conducted, the statistical significance of the results was conducted at $p < .05$ and the Bonferroni corrected $p < .005$.

5.4.5.1 The influence of FIT Integrity

The mean and median rank positions for higher and lower FIT Integrity groups are displayed in Table 5.8. Across the comparisons, two significant differences are evident at $p < .05$ but not at $p < .005$. There was a noticeable and statistically significant difference in ranks for 'my belief there is a need to….' This factor was ranked as more important for individuals with higher levels of FIT Integrity compared with individuals with lower levels of FIT Integrity. The difference in ranks was statistically significant according to inferential analyses conducted using the Mann Whitney-U test ($p = .04$) and suggests that across pro-environmental behaviours, individuals with higher levels of FIT Integrity think personal beliefs as more influential on their actions compared with individuals with lower levels of FIT Integrity. The second significant difference was for the factor 'Government and local authorities leading by example'. This was ranked as the lowest item for both FIT Integrity groups, but the mean rank was significantly lower for the higher FIT Integrity group ($p = .03$).

Further comparisons between the lower and higher FIT Integrity groups were conducted separately for each pro-environmental behaviour. These showed a number of differences, several of which were statistically significant at $p < .05$ but not at the Bonferroni adjusted p-value. Table 5.9 displays those results that were statistically significant or verging on statistical significance. Overall, these are in the direction expected based on previous findings.

For the pro-environmental behaviour of 'recycling materials', individuals with higher levels of FIT Integrity ranked 'my sense of social responsibility' as more influential on this behaviour

compared with individuals with lower levels of FIT Integrity. The direction and significance of this difference was also true for 'recycling equipment'. These results suggest individuals with higher levels of FIT Integrity think that a personal sense of social responsibility has a stronger influence on recycling behaviours compared with individuals with lower levels of FIT Integrity.

The influence of role models from leadership and government was perceived to be stronger for individuals with lower levels of FIT Integrity compared with individuals with higher levels of FIT Integrity. This result was evident for four of the pro-environmental behaviours ('turning taps off', 'walking, cycling or using public transport', 'car-pooling/sharing', and 'recycling equipment') and also corroborates the results of Study 4.

Personal beliefs appear to have a stronger influence on the performance of pro-environmental behaviours for individuals with higher levels of FIT Integrity. There was a large difference in the influence of 'my belief that there is a need to…' and 'my belief in the reality of climate change' for the pro-environmental behaviours of 'turning off electrical equipment' and 'car-pooling/sharing'. Individuals with higher levels of FIT Integrity reported that personal beliefs were more influential on these pro-environmental behaviours compared with individuals with lower levels of FIT Integrity.

In line with the findings of Study 4, the results of this analysis suggest that individuals with lower levels of FIT Integrity think they are more susceptible to the influence of extrinsic factors compared with individuals with higher levels of FIT Integrity. Individuals with lower levels of FIT Integrity reported that 'the attitudes and behaviours of my friends and family' had a larger influence on their 'turning taps off'.

Overall, the direction and statistical significance of the differences between lower and higher FIT Integrity groups suggest that for individuals with higher levels of FIT Integrity, pro-environmental actions are believed to be more strongly influenced by factors intrinsic to the individual, e.g., personal beliefs and strength of personal responsibility. In contrast, for individuals with lower levels of FIT Integrity, factors extrinsic to the individual are believed to have a larger influence on behaviour, e.g., the behaviour of others, be they friends and family locally, or government and local authorities more widely. In summary, individuals with higher levels of FIT Integrity tend to do as they feel they ought to, whereas individuals with lower levels of FIT Integrity tend to do as they are told.

Table 5.8. Study 5 – Descriptive and inferential statistics for the overall ranking of each variable for lower (*n* = 25) and higher FIT Integrity groups (*n* = 25)

	Lower FIT Integrity group			Higher FIT Integrity group				
Scale item	*Mdn*	*M* (*SD*)	Overall rank	*Mdn*	*M* (*SD*)	Overall rank	*Z*	*p*
The attitudes and behaviour of my friends and family	2.61	2.78 (1.77)	1	2.67	3.23 (1.78)	2	-1.01	.31
My sense of social responsibility	2.78	3.05 (1.02)	2	2.89	2.74 (0.98)	1	-0.67	.50
My believing that climate change in man-made	3.89	4.16 (1.44)	5	3.78	3.71 (0.71)	6	-0.80	.43
My willingness to change my lifestyle	3.61	3.65 (0.85)	3	3.78	3.69 (0.91)	6	-0.05	.96
Clear and practical information	4.20	4.32 (0.88)	7	4.33	4.21 (1.21)	7	-0.03	.98
My belief that there is a need to…	4.22	4.18 (0.84)	8	3.67	3.72 (0.84)	4	-2.07	.04*
My belief in the reality of climate change	4.11	4.13 (0.98)	6	4.50	4.29 (1.19)	8	-0.80	.44
Government and local authorities leading by example	5.00	5.02 (1.22)	9	6.16	5.74 (1.34)	9	-2.20	.03*
Believing my actions will make a difference	3.72	3.68 (1.78)	4	3.39	3.65 (1.56)	3	-0.19	.85

*$p < .05$.

Table 5.9. Study 5 – Descriptive and inferential statistics for the ranking for each variable across pro-environmental behaviours for lower (*n* = 25) and higher FIT Integrity groups (*n* = 25)

		Lower FIT group		Higher FIT group			
Pro-environmental behaviour	Scale item	*Mdn*	*M* (*SD*)	*Mdn*	*M* (*SD*)	*Z*	*p*
Recycling materials	My sense of social responsibility	4.00	4.80 (2.41)	3.00	3.24 (1.83)	-2.29	.02*
Turning taps off	The attitudes and behaviour of my friends and family	1.00	2.76 (2.42)	5.00	4.88 (3.10)	-2.51	.01*
	Government and local authorities leading by example	8.00	6.96 (2.09)	9.00	7.44 (2.74)	-2.22	.03*
Turning electrical equipment off	My belief that there is a need to…	6.00	5.64 (1.58)	5.00	4.64 (1.86)	-1.91	.06
Walking, cycling or using public transport	Government and local authorities leading by example	8.00	6.12 (2.89)	9.00	6.92 (3.00)	-1.82	.07
Car-pooling/sharing	My belief in the reality of climate change	6.00	5.32 (1.99)	6.00	5.56 (2.04)	-1.93	.05
	Government and local authorities leading by example	8.00	6.60 (2.63)	9.00	7.80 (2.02)	-2.10	.04*
Recycling equipment	My sense of social responsibility	5.00	4.68 (2.53)	2.00	3.12 (2.01)	-2.33	.02*
	Government and local authorities leading by example	6.00	5.64 (2.94)	9.00	7.64 (2.20)	-2.68	.01*

*$p < .05$.

5.4.5.2 The influence of Behavioural Flexibility

The mean and median rank positions for higher and lower Behavioural-Flexibility groups for each factor's perceived influence across the pro-environmental behaviours are displayed in Table 5.10. There were no statistically significant differences in the rankings according to levels of Behavioural Flexibility. This suggests that an individual's behavioural preferences, as measured by the FIT Profiler, have a weaker effect on pro-environmental activity compared with their cognitive characteristics.

Further analysis on the rankings for individual pro-environmental behaviours revealed one statistically significant difference and two differences that were verging on statistical significance. The first difference, which was close to statistical significance, was on the perceived influence of willingness to change personal lifestyles on 'recycling materials.' Participants with higher levels of Behavioural Flexibility ranked this factor as more important compared with individuals with lower levels of Behavioural Flexibility. The direction of the differences was also the same for the other two comparisons. The perceived influence of the 'attitudes and behaviour of my friends and family' was stronger on 'turning taps off' for individuals with higher levels of Behavioural Flexibility compared with individuals with lower levels of Behavioural Flexibility, and similarly 'believing my actions will make a difference' was believed to have a stronger impact on 'walking, cycling or using public transport' for individuals with higher levels of Behavioural Flexibility compared with individuals with lower levels of Behavioural Flexibility (see Table 5.11).

The differences between Behavioural Flexibility groups were less distinct compared with the differences between the FIT Integrity groups. They do, however, suggest broadly that intrinsic factors are perceived to have a stronger influence on pro-environmental behaviours for individuals with higher levels of Behavioural Flexibility compared with individuals with lower levels of Behavioural Flexibility. In summary, it appears that individuals with higher levels of Behavioural Flexibility behave as they feel they ought to whereas individuals with lower levels of Behavioural Flexibility do as they are told.

Table 5.10. Study 5 – Descriptive and inferential statistics for the overall ranking of each factor for lower (*n* = 23) and higher Behavioural Flexibility groups (*n* = 24)

Scale item	Lower B-Flexibility group			Higher B-Flexibility group			*Z*	*p*
	Mdn	*M* (*SD*)	Overall rank	*Mdn*	*M* (*SD*)	Overall rank		
The attitudes and behaviour of my friends and family	2.78	3.10 (1.68)	2	1.94	2.37 (1.27)	1	-1.00	.32
My sense of social responsibility	2.67	2.79 (0.85)	1	2.94	2.88 (1.10)	2	-.39	.70
My believing that climate change in man-made	3.89	3.98 (1.35)	5	4.22	4.09 (1.22)	6	-1.00	.32
My willingness to change my lifestyle	3.55	3.69 (0.86)	3	3.72	3.68 (0.92)	3	-.61	.54
Clear and practical information	4.11	4.15 (1.15)	7	4.61	4.50 (0.74)	8	-1.31	.19
My belief that there is a need to…	4.11	4.02 (0.88)	6	3.94	4.03 (0.64)	5	-.80	.44
My belief in the reality of climate change	4.55	4.47 (0.92)	8	4.33	4.37 (0.80)	7	-.44	.66
Government and local authorities leading by example	5.22	5.08 (1.19)	9	5.61	5.29 (1.47)	9	-.40	.67
Believing my actions will make a difference	3.55	3.79 (1.88)	4	3.61	3.78 (1.02)	4	-.08	.94

Note. B-Flexibility = Behavioural Flexibility.

*$p < .05$.

Table 5.11. Study 5 – Descriptive and inferential statistics for the ranking for each factor across pro-environmental behaviours for lower (*n* = 23) and higher Behavioural Flexibility groups (*n* = 24)

Pro-environmental behaviour	Scale item	Lower B-Flexibility group		Higher B-Flexibility group		*Z*	*p*
		Mdn	*M* (*SD*)	*Mdn*	*M* (*SD*)		
Recycling materials	My willingness to change my lifestyle	6.00	5.96 (2.34)	5.00	4.79 (2.17)	-1.76	.08
Turning taps off	The attitudes and behaviour of my friends and family	4.00	4.00 (3.03)	1.50	2.38 (2.18)	-1.90	.06
Walking, cycling or using public transport	Believing my actions will make a difference	7.00	5.52 (3.41)	2.50	3.58 (2.72)	-2.00	.04*

Note. B-Flexibility = Behavioural Flexibility.

*$p < .05$.

5.4.6 Exploring the Perceived Influence of Intrinsic and Extrinsic Factors on Pro-environmental Behaviour Habits for Higher and Lower FITness Groups

To explore whether pro-environmental behaviour is a function of multiple factors, hierarchical multiple regression analyses were conducted to explore whether level of FITness moderates

the perceived influence of intrinsic and extrinsic factors on pro-environmental activity. The analyses were conducted separately for FIT Integrity and Behavioural Flexibility variables for each pro-environmental behaviour. Prior to this analysis, a Factor Analysis was conducted on the item pool for each pro-environmental behaviour in order to identify the underlying factor structure and reduce the number of predictors in each regression model. The results of the Factor Analyses (see Appendix E) suggest that each pro-environmental behaviour has a different factor structure, with the number of underlying factors ranging from two factors to four factors. The factor loadings for each pro-environmental behaviour are presented in Table. 5.12. These factors were entered as the predictors in the multiple regression models for their respective pro-environmental behaviours.

In each regression analysis, the predicted variable was the total SRHI score for each pro-environmental behaviour. In the first step of the analysis, the variables included were: FIT group (either lower or higher FIT Integrity or Behavioural Flexibility) and the underlying factors for each behaviour. In step two, and to avoid potentially problematic high multicollinearity with the interaction term, the variables were centred and their interaction was created (Aiken & West, 1991). Only significant or notable results are reported in detail.

5.4.6.1 The influence of FIT Integrity

The regression model predicting 'turning off electrical equipment' was found to be statistically significant, $R^2 = .89$, $F(4, 43) = 88.06$, $p < .01$. The predictor 'Good citizenship' was the only significant predictor in the model, $b = 3.56$, $SE = .20$, $t = 17.72$, $p < .01$. The addition of the interaction term between FIT Integrity and 'Good citizenship' to the regression model did not increase the proportion of variance accounted for, $R^2_{change} = .002$, $F_{change}(1, 42) = 0.66$, $p_{change} = .42$. This suggests that 'Good citizenship' has a direct effect on 'turning off electrical equipment' which is similar regardless of personal levels of FIT Integrity. As 'Good citizenship' increases, so does the pro-environmental behaviour of 'turning off electrical equipment'. Put differently, level of FIT Integrity does not moderate the relationship between 'Good citizenship' and 'turning off electrical equipment'.

The regression models for the other pro-environmental behaviours were not significant, 'recycling materials' ($R^2 = .07$, $F(4, 45) = .69$, $p = .63$); 'turning lights off'' ($R^2 = .08$, $F(4, 45) = 1.01$, $p = .44$); 'turning taps off' ($R^2 = .02$, $F(3, 46) = .36$, $p = .78$); 'walk, cycle or use public transport instead of the car' ($R^2 = .08$, $F(3, 46) = 1.27$, $p = .28$); 'car-pooling/sharing' ($R^2 = .11$, $F(3, 46) = 1.90$, $p = .14$); and 'recycling electrical equipment' ($R^2 = .10$, $F(2, 47) = 2.53$, $p = .09$).

5.4.6.2 The influence of Behavioural Flexibility

The regression model predicting 'turning off electrical equipment' was found to be statistically significant, R^2 = .87, $F(4, 40) = 69.57$, $p < .01$. The predictor 'Good citizenship' was the only significant predictor in the model, $b = 3.57$, $SE = .22$, $t = 16.19$, $p < .01$. The addition of the interaction term between Behavioural Flexibility and 'Good citizenship' to the regression model did not increase the proportion of variance accounted for, $R^2_{change} = .001$, $F_{change}(1, 39) = 0.25$, $p_{change} = .62$. This suggests that 'Good citizenship' has a direct effect on 'turning off electrical equipment' which is similar regardless of personal levels of Behavioural Flexibility. As 'Good citizenship' increases, so does the pro-environmental behaviour of 'turning off electrical equipment'.

The regression models for the other pro-environmental behaviours were not significant, 'recycling materials' (R^2 = .18, $F(5, 41) = 1.77$, $p = .14$); 'turning lights off'' (R^2 = .03, $F(4, 42)$ = .29, $p = .88$); 'turning taps off' (R^2 = .03, $F(3, 43) = .40$, $p = .75$); 'walk, cycle or use public transport instead of the car' (R^2 = .13, $F(3, 43) = 2.17$, $p = .11$); 'car-pooling/sharing' (R^2 = .11, $F(3, 43) = 1.67$, $p = .18$); and 'recycling electrical equipment' (R^2 = .10, $F(2, 44) = 2.31$, $p = .11$).

In summary, the results of the hierarchical regression analyses identified two significant regression models for the pro-environmental behaviour 'turning off electrical equipment'. The results suggest that 'Good citizenship' is perceived to have a direct effect on this behaviour, which is similar regardless of level of personal FITness (FIT Integrity or Behavioural Flexibility), and indicates that perceptions of being a good citizen can influence people's performance of pro-environmental behaviours that are weaker habits.

Table 5.12. Study 5 - Factor loadings for the pro-environmental behaviours

	Recycling materials				Turning lights off				Turning taps off			Turning off electrical equipment			Walking, cycling or public transport			Car-pooling/sharing			Recycling equipment	
Scale item	F1	F2	F3	F4	F1	F2	F3	F4	F1	F2	F3	F1	F2	F3	F1	F2	F3	F1	F2	F3	F1	F2
The attitudes and behaviour of my friends and family			X		X				X			X			X			X				
My sense of social responsibility				X			X				X		X		X			X				X
My believing that climate change in man-made				X		X				X			X			X			X			
My willingness to change my lifestyle	X							X	X			X			X			X				
Clear and practical information	X						X				X			X			X			X		X
My belief that there is a need to…		X					X				X	X					X	X				X
My belief in the reality of climate change			X		X				X			X			X			X				
Government and local authorities leading by example				X		X			X				X		X			X				
Believing my actions will make a difference	X							X		X		X				X		X				

5.5 Discussion

The purpose of this study was to explore respondents' engagement with a range of pro-environmental behaviours, and to elucidate the role of habit in pro-environmental activity. The habit characteristics were identified using the Self-Report Habit Index (SRHI; Verplanken & Orbell, 2003), and the strength of these characteristics were compared and contrasted across seven pro-environmental behaviours, and according to levels of personal FITness. Following on from Study 3 and Study 4, this study also explored the perceived influence of intrinsic and extrinsic variables on the pro-environmental behaviours, and considered whether their strength of influence was believed to differ according to strength of habit and levels of FITness. In contrast with most studies on pro-environmental activity, this study focused on a range of different pro-environmental behaviours rather than focusing on one of these in isolation. When seeking to foster pro-environmental behaviour change, it is helpful to know for any target behaviour which factors do and do not influence it (Bratt, Stern, Matthies & Nenseth, 2015). By including a broad range of pro-environmental behaviours and exploring the factors that influence each of these, this study has helped to identify the factors that need to be addressed in order to encourage pro-environmental behaviour change and the development of environmentally sustainable lifestyles.

5.5.1 Reviewing the Hypotheses

The first objective of the study was to explore generally respondents' preference for routine in day-to-day life and the existence of a relationship between the perceived frequency and strength of habit of daily behaviours. The following hypothesis was explored:

> H_{5a}: There will be a positive relationship between the strength of an individual's overall preference for routine and the perceived habit strength of daily behaviours and how frequently these are performed.

This hypothesis was partially supported. The behaviours that were perceived as stronger habits were also performed more frequently, but there were no relationships between these variables and overall preference for routine.

The second objective of this study was to compare and contrast the habit profiles of a range of different pro-environmental behaviours. Two hypotheses were explored:

H_{5b}: It is expected that the habit profiles (repetition, difficulty controlling behaviour/automaticity, lack of awareness, efficiency, and identity) of different pro-environmental behaviours (as measured by the SRHI) will differ from each other.

H_{5c}: The overall habit strength of pro-environmental behaviours (as measured by the SRHI) will relate to preference for routine. Individuals with a higher preference for routine in daily living will have stronger pro-environmental behaviour habits.

The pro-environmental behaviours did differ in their habit strength and in relation to the habit characteristics that defined them. Hypothesis 5_b is, therefore, supported. Daily curtailment/efficiency behaviours such as 'turning taps off', 'turning lights off', and 'turning off electrical equipment' were the strongest habits (as indicated by higher total SRHI scores) whereas the behaviours 'recycling equipment' and 'car-pooling/sharing' were the weakest habits according to scores on the SRHI. In terms of their habit profiles, 'repetition' was the strongest characteristic of all pro-environmental behaviours. Curtailment behaviours (e.g., turning off activities) were more strongly defined by a 'lack of awareness' whereas travel mode choice behaviours were more strongly defined by 'self-identity'.

In relation to Hypothesis 5_c, the habit strength of pro-environmental behaviours was largely independent from an individual's overall preference for routine. There was one relationship evident between preference for routine and the travel mode choice behaviour of 'walking, cycling or using public transport rather than the car'. This indicated that individuals who had a higher preference for routine were less likely to perform this travel mode behaviour. Overall, the results do not support Hypothesis 5_c.

The third objective of this study was to explore the relationship between habit characteristics and levels of personal FITness. Specifically:

H_{5d}: It is expected that there will be a relationship between the habit characteristics of pro-environmental behaviours (as measured by the SRHI) and FIT variables.

There were some differences in the habit profiles of pro-environmental behaviours according to levels of personal FITness. The differences observed were for the pro-environmental behaviours that were performed less frequently (e.g., 'recycling equipment' and 'walking, cycling or using public transport rather than using the car'). Individuals with higher levels of FIT Integrity have greater difficulty controlling the behaviour, are less aware of its

performance, and have a stronger sense of self-identity with the behaviour. The directions of the relationships suggest that higher levels of personal FITness help individuals to engage with the pro-environmental behaviours that were weaker habits. These results, therefore, partially support Hypothesis 5_d.

The fourth and fifth objectives of the study were to investigate the factors that are perceived to influence different pro-environmental behaviours according levels of personal FITness, and the strength of habit. The following hypotheses were made:

> H_{5e}: The factors that are perceived to influence pro-environmental activity will differ according to the pro-environmental behaviour.
>
> H_{5f}: The factors that are perceived to influence pro-environmental behaviour will differ according to level of FITness. It is expected that for individuals with higher FITness, intrinsic factors will be perceived to exert a stronger influence on pro-environmental behaviour. For individuals with lower FITness, extrinsic factors will be perceived to have a stronger influence on behaviour.
>
> H_{5g}: It is expected that individuals will perceive intrinsic factors to have a stronger influence on pro-environmental behaviours that have weaker habit profiles and that extrinsic factors will be perceived to have a greater influence on pro-environmental behaviours that have stronger habit profiles.

There was a large degree of similarity in the factors that are perceived to influence different pro-environmental behaviours, however, some differences did emerge according to strength of habit and levels of personal FITness. In relation to the former variable, the results indicated that the pro-environmental behaviours with lower SRHI scores, i.e., 'weaker' habits, were more closely aligned to an individual's personal beliefs. However, overall there was no clear pattern of results. There was a clearer perceived influence according to level of FITness. This suggested that intrinsic factors were perceived to have a stronger influence on behaviour for individuals with higher levels of FITness compared with individuals with lower level of personal FITness. Overall, the results do not support Hypothesis 5_e and Hypothesis 5_g, and they partially support Hypothesis 5_f.

5.5.2 The Habitualness of Pro-environmental Behaviours

Not surprisingly, the results of this study suggest that pro-environmental behaviours differ in their strength of habit and in relation to the habit characteristics that define them. Daily curtailment/efficiency behaviours such as 'turning taps off', 'turning lights off' and 'turning off electrical equipment' were the stronger habits (as indicated by higher SRHI scores) whereas behaviours such as 'recycling equipment' and 'car-pooling/sharing' were the weaker habits according to scores on the SRHI. This result is, perhaps, not surprising given that one underlying factor in the SRHI is repetition. 'Turning off' or curtailment pro-environmental behaviours are more likely to occur frequently and be repeated as part of an individual's daily routine. In other words, this type of behaviour is more likely to have a higher daily occurrence, and this higher natural frequency could skew significantly scores on the SRHI.

Overall, the habit profiles across the different pro-environmental behaviours suggest that people have clusters of pro-environmental behaviours that they perform, but they tend not to perform all behaviours equally, and not all behaviours are characterised as strong habits. Pro-environmental activity appears to have a multidimensional structure. It seems that individuals act pro-environmentally within behavioural categories that are clustered by sector, and there appears to be a limited amount of positive spillover across these categories. The correlation analysis showed positive relationships amongst the behaviours of similar types based on the action that is required, e.g., turning off, or the equipment that is involved, e.g., electrical equipment. These results concur with Thøgersen and Noblet (2012) who argue that behaviours in the same taxonomic categories (time and place of behaviour, skills required, etc.) tend to be more strongly correlated than behaviours with different taxonomic categories. This might result from behaviours being cognitively represented according to purpose and therefore intentions to act in one sector might therefore spread to other behaviours with a similar purpose (McCloskey, 1991).

As in Barr, Gilg and Ford (2005), three behavioural clusters emerged in this study. The first cluster related to 'turning off' curtailment behaviours. The behaviours 'turning off lights', 'turning off taps', and 'turning off electrical equipment' were all significantly correlated. The second cluster related to travel mode choice behaviour. The pro-environmental behaviours 'walking, cycling or using public transport' and 'car-pooling/sharing' were positively and significantly correlated. The third cluster related to recycling and included 'recycling materials'

and ‘recycling equipment’. Overall, these findings concur with previous research (Stern & Oskamp, 1987; Thørgersen & Örlander, 2003; De Kruijk & Raaji, 1991), and suggest that behaving pro-environmentally in one behavioural category can have little or no bearing on the propensity to behave in an environmentally friendly way in other areas.

There was only a small degree of behavioural spillover across categories to behaviours of different types. This, again, suggests that pro-environmental activity is multidimensional and can be organised according to sector (see Prillwitz, & Barr, 2009). The inconsistency of pro-environmental behaviours found in this study is perhaps surprising in the light of social-psychological theories that suggest most people have a desire to be consistent in their attitudes, beliefs, and behaviours (e.g., Festinger, 1957, theory of cognitive dissonance). However, the inconsistency might also result because of the presence of external factors that influence the cost and convenience of performing the behaviour (see also Kaiser & Schultz, 2009).

A third perspective, which has been discussed throughout this programme of research, is the direct and indirect influence of habit. Behaviours may be structured by their frequency and automaticity (Dahlstrand & Biel, 1997). When behaviours are organised and defined by habit, as many daily behaviours are (see Ouellette & Wood, 1998), people are not always fully aware of the ways that they behave because they act in an automatically scripted manner. Such automaticity means that people are often unaware of their current behaviours, the impact that these have, and the alternative courses of action that are available. Indeed, the empirical results of this study suggest that the pro-environmental behaviours that were stronger habits were defined more strongly by a lack of awareness. This lack of awareness about behaviour might mean that individuals are simply unintentionally ‘blind’ to the behaviours that they perform and to the inconsistencies that might be present across behavioural repertoires. In other words, people are unaware of their inconsistencies because existing habits blinker their perception of this. Without a sufficient level of awareness, individuals are unable to see where change might happen. In essence, when behaviour is habitual, old habits inhibit or block adoption of new pro-environmental behaviours (Klöckner & Matthies, 2004; Klöckner, Matthies & Hunecke, 2003).

5.5.3 Habit Characteristics of Pro-environmental Behaviours

Although the strength of habit for pro-environmental behaviours differed, there was a large degree of similarity in the habit profiles of the different pro-environmental behaviours. ‘Repetition’ was identified as the strongest characteristic for all of the pro-environmental

behaviours and 'difficulty controlling the behaviour' was the weakest characteristic. A lack of awareness was more prominent for 'turning off' curtailment behaviours ('turning lights off', 'turning taps off' 'turning off electrical equipment'), whereas self-identity had a stronger effect on travel mode choice and recycling behaviours (see also Murtagh et al, 2012; Fekadu & Kraft, 2001; Smith, Terry, Manstead, Louis, Kotterman & Wolfs, 2007; Whitmarsh & O'Neill, 2010).

Separately, the regression analyses also suggested a similar pattern of results in terms of the factors that are perceived to influence behaviour. The 'weaker' pro-environmental behaviours were believed to be more closely connected to an individual's personal beliefs about environmental sustainability. For example, personal beliefs and motivations to act were believed to be more important for recycling behaviours, and being a good citizen was believed to be more important for travel mode choice behaviours. In contrast, the 'stronger' pro-environmental behaviours (e.g., 'turning off' behaviours) had a stronger connection to social influences.

In summary, it is apparent that habits can have a positive impact on pro-environmental activity and that much pro-environmental behaviour, especially behaviour pertaining to curtailment activities, is characterised by habit. As James (1890) suggested, habits ensure that (pro-environmental) behaviours are performed efficiently as a part of daily routines without overexertion of cognitive resources. This is good when established behaviours are pro-environmental. However, the habit characteristics that support behaviours might also resist significantly attempts to change non-'green' behaviours towards a more pro-environmental orientation. Behaviour change interventions should, therefore, target directly the development of new 'green' behavioural habits. This could be supported through a process of new habit development. They should also challenge directly existing habits that are less pro-environmental. This could be done through a process of habit reversal. These suggestions will be incorporated into the design of a new pro-environmental behaviour change intervention proposed in Chapter 7.

5.5.4 The Influence of FITness on Pro-environmental Behaviour Habits

The relationships observed between FIT variables and the habit characteristics of each pro-environmental behaviour suggest that individuals with higher levels of FITness (FIT Integrity and Behavioural Flexibility) have a stronger sense of self-identity with pro-environmental behaviours that are weaker habits (e.g., 'recycling equipment'). For example, there was a

positive and statistically significant relationship between Behavioural Flexibility and self-identify for the pro-environmental behaviour 'walk, cycle or use public transport instead of the car' and a similar relationship was observed between FIT Integrity and self-identity for the pro-environmental behaviour 'recycling equipment'. These results might suggest that individuals with higher levels of FITness are less reliant on the automaticity of habit and intentionally behave pro-environmentally. When pro-environmental habits are strong, as they are generally for curtailment behaviours such as 'turning off electrical equipment', an individual's level of good citizenship has a direct effect on this behaviour regardless of level of personal FITness.

In sum, it appears that development of levels of FIT Integrity might help individuals to affiliate with pro-environmental activity and believe that they are capable of performing behaviours that are more difficult, and a sufficient level of Behavioural Flexibility might help people to feel sufficiently free from existing habits and be able to try out new pro-environmental behaviours. Development of Behavioural Flexibility needs to be guided in a structured way so that it supports engagement with pro-environmental activity, rather than interrupts it. These findings will be considered in the design of the FIT-based behaviour change intervention that follows.

5.5.5 Strength and Limitations

This study, as far as I am aware, was the first to undertake an empirical examination of the habit characteristics of a range of pro-environmental behaviours. It was the first to consider pro-environmental behaviour repertoires rather than isolated pro-environmental behaviours. Furthermore, in relation to this, this study also considered the perceived strength of influence of intrinsic and extrinsic factors across these behaviours, and explored how the habit characteristics and determinants of a range of pro-environmental behaviours were related to and differed according to levels of FITness. Other studies have explored the habit characteristics of individual pro-environmental behaviours (e.g., Verplanken, 2014) but have not compared and contrasted this with the profiles of other pro-environmental behaviours or – in consideration of the potential habit chain – the intrinsic and extrinsic factors that are perceived to influence the behaviour.

The data collected were cross-sectional and self-reported. Exploring the pro-environmental behaviour profiles and habit characteristics of these through observation research would be a useful avenue for future research, particularly in light of the inaccuracies of self-report data (Warriner et al, 1984) and the potential bias resulting from socially desirable responding

(Paulhus, 1991). Further research should also explore the factors that facilitate and impede the spillover of pro-environmental behaviours across different sites of practice, such as at home and in the workplace, and also explore these factors in more detail in order to help with the design of effective behaviour change interventions.

Finally, this study represents an initial empirical investigation into the habit characteristics and the factors that are perceived to influence action for a range of pro-environmental behaviours using correlation data. While this study has identified the differences between pro-environmental behaviours, further (longitudinal/experimental/observational) work is needed to model the habit profiles over time and in situ, as they happen in real time. The automaticity of habits means that people are often unaware of the way that they behave. Therefore, their reflections might not represent the reality of the situation.

5.6 Conclusions

This study suggests that pro-environmental activity has a multidimensional structure that is defined by several relatively distinct behavioural fields. The behavioural categories of pro-environmental activity are partially defined by behavioural similarity or purpose but also by their strength of habit. There is a larger degree of spillover across pro-environmental behaviours of a similar type. Habits can support the performance of pro-environmental behaviours in daily life but they can also impede attempts to change behaviour towards a more pro-environmental intent. By defining pro-environmental behaviour categories by habit, behavioural similarity, and purpose, this study has highlighted that it might be advantageous to apply different intervention techniques to develop different pro-environmental behaviours and encourage spillover across them. In light of these findings, Chapter 6 reviews popular interventions for pro-environmental behaviour change and considers their effectiveness for different pro-environmental behaviours.

6 A Review of Interventions for Pro-environmental Behaviour Change

6.1 Introduction

One objective of this programme of research was to develop an alternative approach to pro-environmental behaviour change, to help people to develop lifestyles that are overall more environmentally sustainable. In pursuit of this goal, the empirical studies have explored pro-environmental activity from many perspectives including, the range of different behaviours that are performed, the influence of context, the strength of existing habits, and the influence of levels of FITness. The results from these studies have given useful insights into how a new behaviour change intervention based around the FIT Framework (Fletcher & Stead, 2000) might be designed. In addition to the insights provided by these empirical studies, it also helpful to draw on the findings of established intervention techniques, as these are a good starting point for developing new approaches (Gollwitzer & Oettingen, 2014). Therefore, this Chapter provides a review of popular and historical techniques for pro-environmental behaviour change.

Throughout this dissertation I have suggested that resistance to climate change and pro-environmental behaviour change is largely a psychological problem caused by an established network of habits in cognitions, affect, and behaviour. In line with this thinking, this review will focus on the established intervention techniques that focus on targeting change directly in these areas. In other words, it will focus on psychological approaches to change. There are, of course, many more different intervention techniques that could be included (e.g., structural changes, nudge, etc.), but it is not possible to review each of these here (see McDonald, 2014 for a review); only those techniques that are perceived to be the most relevant will be included.

The review of each intervention technique will be structured around the main challenges faced by environmental researchers, as identified in Chapter 1. To recap, these were:

1. To establish environmental concerns in the "attentional set" of the target audience by encouraging them to pay active attention to their current behaviours, the impact that these have, as well as to the alternative and more environmentally sustainable behaviours that are available. This relates to making people more aware of the opportunities that are available to them.

2. To develop intrinsic beliefs relating to self-efficacy, so that people feel empowered and capable of taking a different course of action.
3. Ensuring that people have sufficient behavioural skills and abilities to take appropriate action. This might involve the weakening of existing habits and the development of new behaviours – targeting directly the influence of habits.

This review considers the type of behaviour to which interventions have been applied. For example, when intervening with the aim of pro-environmental behaviour change, there are two potential behavioural foci (Steg & Vlek, 2009). The first focus is on those behaviours that have a direct impact on the environment such as recycling, travel choices, and the use of technologies and equipment. The other focus is on behaviours that have an indirect impact on the environment, through production, transportation, and disposal processes (e.g., consumption behaviours). The review also considers the measure(s) that is used to evaluate change, acknowledging that although direct objective measures of change are ideal, self-reports are often used as a satisfactory proxy measure. The final consideration is the impact and durability of the change, both in the short- and longer-term.

6.2 Pro-environmental Behaviour Change Interventions

Generally, the psychological behaviour-change interventions that seek to increase pro-environmental activity can be broadly categorised as informational strategies that are designed to change an individual's knowledge, awareness, norms and attitudes – the variables that are likely to be the antecedents of the behaviour (see Steg & Vlek, 2009). Informational intervention techniques can either be *antecedent* by targeting the underlying variables prior to behaviour (such as information campaigns to raise awareness), or they can be *consequent* and provide information (such as feedback) following the behaviour. This review will focus on the different informational approaches that have been used to encourage pro-environmental behaviour change.

6.2.1 Information Approaches

Information provision has been one of the most widely used methods to change behaviour for environmental sustainability (Schultz et al, 2008) perhaps because historically, many models of behaviour were developed from the perspective of bounded rationality; they perceived knowledge as a reliable predictor of environmental behaviour (Hines, Hungerford & Tomera,

1987). Much environmentally destructive behaviour has often been attributed to a lack of knowledge on the part of the user (McCalley & Midden, 2002), and this can be a significant barrier to pro-environmental action and behaviour change (Clayton & Meyers, 2009). Informational approaches seek to change behaviour by reducing the knowledge-deficit that people often have about anthropogenic climate change. As previously mentioned, people tend to have a low level of awareness of environmental problems and the ways that these can be mitigated (see Page & Page, 2014a), and so providing them with information might help to raise their awareness (see also Schultz, 2002).

Information can be provided in a variety of ways: either the direct provision of information in workshops, mass media campaigns, and feedback; or the indirect provision of information through the observation of others' behaviours (modelling), and normative messaging. The information provided can be either standardised or tailored according to individual circumstance. It can also be provided before or after performance of behaviour (antecedent or consequent). In sum, informational approaches can differ according to the *type* of information provided and *how* the information is disseminated.

6.2.1.1 Antecedent Information Approaches

6.2.1.1.1 The provision of standardised information

Providing standardised information is one possible way of reducing the knowledge-deficit. This approach involves providing the same information to all individuals. If effective, it has the potential to have a wider impact than tailored information campaigns. One way that standard information can be provided is in workshops. This approach has been used successfully to increase concern and awareness about home energy consumption, and to strengthen behavioural intentions. It has not, however, necessarily resulted in behaviour change (see Geller, 1981).

Mass media campaigns have also been used to disseminate standardised information to a critical mass of people with the intent of having a large-scale impact. This approach has enabled the information provision to be channelled through different media outlets including television, newspaper, radio, the internet, and social media, among others. For example, in 1977 President Carter made a television appeal to ask householders to save energy, in consideration of the USA gas shortage. In an assessment of its impact three days later, Luyben (1982) found no immediate effect of the television appeal on behaviour or knowledge. The thermostat settings

in those households who saw the mass media campaign were no lower than those who didn't see the campaign, nor did these households have greater awareness that reducing thermostat temperatures would help to save energy. This suggests that the provision of information en masse does not necessarily result in large-scale behaviour change. This might be because people do not receive the information or they might not be receptive to it; they might not perceive the information because of low levels of awareness, or despite receiving the information, they might not feel capable of changing their behaviour.

Longer-term mass media campaigns, rather than one-off messages, have been shown to have a more positive impact on behaviour change. The use of a variety of different media outlets in combination with specific advice about how to change behaviour has also been successful. For example, the USA's Department of Energy's Lo Cost/No Cost programme distributed an information booklet of energy-saving tips, alongside a shower flow control device, to 4.5 million households. The intent was to raise awareness as well as increase the relationship between information and behaviour. These offerings were also supported by a mass media campaign broadcast on television, radio, and newspapers over a 4-week period. Overall, the approach was found to be effective for those households who responded and engaged, i.e., those who read the information leaflet and/or installed the shower flow restrictor. Responsive households implemented more of the energy-saving tips compared with non-responsive and control households but there was a limit to the number of tips implemented overall, approximately 50% were performed (Hutton & McNeill, 1981). There were, however, also many households who simply did not engage with the approach.

In a longer-term campaign of 2.5 months, Staats, Wit and Midden (1996) also found that a majority of people do not change their behaviour following receipt of information provided in a mass media campaign. They assessed a Dutch government campaign that was designed to increase the population's awareness of global warming and ways to deal with it. Information was disseminated in a variety of different ways such as through billboards, posters, television commercials, advertisements, and a self-collection brochure. In a pre- to post-campaign assessment of knowledge, concern, and behaviour, Staats et al (1996) found that the campaign only impacted individuals who were behaving pro-environmentally beforehand, in other words, those individuals who were sufficiently aware of the issue and were already pro-environmentally disposed. Furthermore, the environmental behaviours performed were

largely independent from knowledge and problem awareness. This suggests that environmental behaviours were not developed as a result of the informational campaign.

In sum, it appears that the provision of standardised information in mass media campaigns has a very limited impact on behaviour, and mainly on those individuals who are already pro-environmentally disposed and are sufficiently aware of the problem. The overall impact on behaviour change is modest (Burgess, Harrison & Filius, 1998; Kollmuss & Agyeman, 2002; Steg, 2008; Peattie, 2010). It seems that effectiveness might depend on a number of variables including, amongst others, the type of information that is conveyed and its specificity, the duration of the campaign, the mode of delivery, an individual's existing level of awareness, knowledge, concern, behavioural habits, and contextual forces.

The provision of more specific information using a variety of mediums over an extended period of time appears to be more effective, but there is still no guarantee that this provision of information will be enough to challenge sufficiently existing habits and change behaviour. The information campaigns that target a specific behaviour (e.g., Luyben, 1982) appear to be no more effective than those that offer a range of change options (Staats et al, 1996). When the multiple options are available, people appear to be selective about what they are willing to change (Hutton & McNeill, 1981). This suggests people tend to remain inflexible and stay within their behavioural comfort zone. They appear to change the behaviours that are not too difficult and costly to perform, rather than those that are more challenging (see also Lanzini & Thøgersen, 2014; Thøgersen & Crompton, 2009). Overall, these findings suggest that the provision of standardised information is necessary, and a starting point for raising general awareness to the problem, but not wholly sufficient to get people to undertake behaviour change and develop a lifestyle that is overall more environmentally sustainable. The provision of standard information, if appropriate to personal circumstance, can raise people's awareness of the need to change, but it does not tell them how they can change in a realistic and achievable way, nor does it empower them to feel confident about changing their behaviour.

6.2.1.1.2 The provision of tailored information

Considering the diversity of lifestyle patterns both in the UK (Druckman & Jackson, 2008) and Europe (Abrahamse & Steg, 2009), it is not wholly surprising that providing standardised information en masse has not had widespread success at effecting behaviour change. The offering of tailored information that is designed specifically for a person, or group of people,

based on their current circumstance and personal characteristics (Kreuter, Farrell, Olevitch & Brennan, 1999) has been shown to be a more effective method (Abrahamse, Steg, Vlek & Rothengatter, 2007; Dwyer, Leeming, Cobern, Porter & Jackson, 1993). This approach typically starts with an assessment or audit of the context, which is then followed-up with tailored and personal advice on the best approach to change (Abrahamse et al, 2005). Revell (2014, p.462) described home energy audits as an "informational behaviour change strategy that evolves around the provision of specific, personalised and tailored information".

Interventions that provide tailored information as part of a home energy audit have been effective both in the short- and longer-term. For example, in Winnett, Love and Kidd's study (1982-1983), households receiving tailored information consumed 21% less energy compared with control households 2-months following the audit. They were also 15 times more likely than controls to reduce their energy consumption by at least 6%. Moreover, the effectiveness of providing tailored information has also been shown to be cumulative and to develop over time. In Hirst and Grady's study (1982-1983), which used a similar experimental design to Winett et al (1982-1983), households who received an audit consumed 1-2% less energy compared with controls 1-year on, and 4% less at 2-years' post-intervention.

However, the empirical evidence is not conclusive. Revell (2014) assessed the effectiveness of the RE:NEW home energy visit programme and estimated the change in a household's environmental impact as a result of the programme. RE:NEW is a London-focused home energy visit programme supported by the Office of the Mayor of London and the Greater London Authority (GLA). The primary purpose of the programme is to reduce domestic CO_2 emissions in London, with a secondary purpose being to help residents save money on their energy bills (Climate Energy, 2012; GLA, EST, 2013). The RE:NEW home energy audits comprise a trained energy advisor visiting residents' homes and giving them a full energy audit alongside simple energy, water efficiency, and behaviour change advice. Revell (2014) assessed the carbon impact of the measures installed during the home visit and the impact of behavioural change that occurred subsequently. It is the latter of these variables that is of interest here. Despite providing behaviour change advice and tailored information, the RE:NEW programme had no impact on the frequency of curtailment behaviours. There was no difference in residents' water- or energy-saving behaviours before or 6-months post the home energy audit. This study

suggests that home energy audits do not necessarily overcome the barriers to behaviour change.

The labour and time intensiveness of home visits is not always practical. As Dowd and Hobman (2013) observed, it is difficult to provide highly individualised information cost-effectively. To save on this, tailored information has also been provided remotely to households and to communities as a whole (McMakin, Malone & Lundgren, 2002). When the focus has been on households, residents have inspected their own property for energy problems and then reported this information back to an energy adviser who then analyses the data and informs the resident of appropriate actions to take. There is no home visit from an energy expert, the tailored information is provided remotely. The effectiveness of this approach has been shown to be mixed. McDougall, Claxton and Ritchie (1982-1983) found no differences in self-reported behaviours or energy savings between households who participated in the program and those who didn't. However, in contrast, Benders, Kok, Moll, Wiersma and Noorman (2006) found that personalised information provided to householders on the Internet was an effective approach to behaviour change over a 5-month period. This study used a two-step process to provide tailored information at baseline, and at 2-months following feedback from participants on their adjusted behaviours.

In sum, it seems that providing tailored information to elicit behaviour change is more effective than providing standardised information en masse. Tailored information has also been applied successfully in non-domestic settings such as in an organisational context (see Daamen, Staats, Wilke & Engelen, 2001). However, when providing information to encourage pro-environmental behaviour change, there appears to be a trade-off between effectiveness and cost of implementation (Dowd & Hobman, 2013). The studies that have shown the most promising results were those that typically included a home visit by an energy expert (e.g., Winnett et al, 1982-1983; Hirst & Grady, 1986), and provided information on more than one occasion (Benders et al, 2006) rather than at baseline only (Revell, 2014). This suggests that a phased approach to change might help to reduce the knowledge-deficit steadily over time. It might be that providing the information in this way allows an individual to deal with each issue gradually, a process that is thought to be more effective (Thørgersen, 2005) and less resource depleting (Baumeister et al, 2000). This, then, might help to reinforce new behaviours and

establish them as new habits so that they are less fallible to the impulsive rebound/fall back effects often seen after extended periods of intentional behaviour control (Baumeister, 2002).

6.2.1.1.3 Information from observing other people – modelling

Observing other people's behaviour can also be an effective way to convey information to instigate behaviour change. As the empirical studies in this programme of research have shown, people are an important source of information in day-to-day life and can have a strong influence on an individual's pro-environmental activities. According to social learning theory (Bandura, 1977), people learn by making inferences about how to behave based on the observation of others. If other people's behaviour is understandable, relevant, meaningful, and rewarding, it is likely that it will influence the observer's behaviour. Two different types of modelling have been used to encourage pro-environmental behaviours. These include; the direct observation of others' behaviours within a household or community setting, and observations through media sources. Empirical studies have investigated the effectiveness of both methods, usually in conjunction with another behaviour change technique such as feedback or the provision of information.

Some research studies have suggested that modelling is a more effective approach to changing behaviour compared with providing standardised and tailored information and feedback (Winnett, Hatcher, Fort, Leckliter, Love, Riley & Fishbank, 1982). For example, using a vignette approach to demonstrate energy conservation strategies for heating, cooling, and thermostat control, Winnett et al (1982) found that modelling energy-savings via video was the most effective approach to changing behaviour in the long-term. They ran a series of different intervention types and combinations ([a] information + modelling tape; [b] feedback + modelling tape; [c] information + discussion tape; [d] none of the above) over a 5-week period and compared their impact for 9-weeks following. Larger energy-savings for the modelling interventions were apparent and also congruent with participants' ratings of the video programs; this type of program was also preferred. Although it is good to see that the modelling-based intervention was effective, because of the design of the study, it is not possible to know how much of the behaviour change was attributable only to the modelling information rather than to the other techniques.

Other studies have shown that the pairing of modelling with other techniques appears particularly effective during the intervention phase but less effective during follow-up (see

Winett et al, 1982). Pairing modelling with information about how to save energy was found to be more effective for high-consumers of energy during the intervention phase but the effects did not persist during the follow-up period (Winett, Leckliter, Chinn, Stahl & Love, 1985).

The social relevance of those modelling the behaviour also appears to impact on effectiveness. Using members of the community where the change is taking place makes this approach particularly successful. From the perspective of social learning theory (Bandura, 1977), these individuals are particularly relevant. In a campaign to raise awareness and reduce household energy consumption on a military base, McMakin et al (2002) used tailored video programmes of residents modelling desired behaviours. Over a 1-year period they found that energy consumption was lowered by 10% compared with usage the previous year, and residents explained that modelling good examples to other residents and children largely motivated their behaviour change.

In sum, using modelling in conjunction with another form of information provision (feedback or standard/tailored information) appears to be an effective and favourable approach for changing behaviour, particularly when socially relevant others are the 'models' (see McMakin et al, 2002). However, the few studies that have explored the influence of modelling on pro-environmental behaviour suggest that it might not be an effective technique on its own.

6.2.1.1.4 Information about other people – norms

Simply knowing about others' behaviour, rather than observing their behaviour directly, is also enough to encourage pro-environmental behaviour (Nolan, Schultz, Cialdini, Goldstein & Griskevicius, 2008), and can strengthen behaviour intention (Smith, Louis, Terry, Greenaway, Clarke & Cheng, 2012). Social norms offer one way to convey information about other people's behaviour. This information results from social interactions, and it relates to rules and standards that guide and constrain actions without force or law (Schultz et al, 2008). Social norms are often used, perhaps unknowingly, as a reference point for guiding one's own behaviour (Baer, Stacy & Larimer, 1991; Clapp & McDonnell, 2002). Norms can convey information about the prevalence of other people's behaviour (descriptive norm) or others' approval or disapproval of it (injunctive norm), and can influence significantly pro-environmental behaviour (see Study 5). Empirical research on normative messaging has shown how social norms positively affect people's littering behaviour (Cialdini, Reno & Kallgren, 1990), purchasing behaviours (Goldsmith & Clark, 2012), waste disposal behaviours (Reese,

Loeschinger, Hamann & Neubert, 2013), and towel use in hotel settings (Goldstein, Cialdini & Griskevicius, 2008).

In a series of studies on social norms, Schultz and colleagues explored the influence of descriptive only information, and paired descriptive and injunctive information, on the performance of pro-environmental behaviours. In 2007, Schultz, Nolan, Cialdini, Goldstein and Griskevicius provided households with one of four types of normative message: (a) baseline information about how much energy (in kilowatt-hours per day) they had used previously, (b) normative information about the energy consumption of the average household in their neighbourhood during the same time period, (c) suggestions of how to conserve energy, and (d) descriptive and normative information (a + b + c) plus an emoticon that conveyed an injunctive message of approval or disapproval about whether their household had consumed more (☹) or less (☺) energy than the average household. They also implemented a similar experimental design to explore the effect of normative messaging on towel use (as a proxy for the amount of energy used) in hotels (see Schultz et al, 2008).

In both studies, Schultz and colleagues found that the descriptive norm only condition (b) was only effective at reducing energy consumption (and towel use) for households/individuals who consumed more than the average during the baseline period. The descriptive information increased energy/towel consumption levels for those who consumed less than the average during the baseline period. The pairing of descriptive and injunctive norms together was more effective and overcame the negative boomerang effect for low consumers. It helped to ensure that consumption levels remained low for this group throughout the intervention (see also Smith et al, 2012).

The results of these studies suggest that the type of norm that is conveyed in the message is important, and can influence behaviour significantly. In a third study, Schultz et al (2008) also explored whether the referent group of the normative information influenced the level of behaviour change. Participants were randomly assigned to receive either a normative message referring to a generic reference group (e.g., previous guests who stayed at the hotel), a specific reference group (e.g., previous guests who stayed in the same room), or a control condition, which only described how to reuse towels. They found that over a period of 5-months, towel replacements were significantly higher for the control condition compared with the generic and specific norm conditions, but there was no difference in towel reuse between the two norm

conditions. These results have been replicated recently in hotel rooms across Europe (see Reese, Loew & Steffgen, 2014).

Further research has explored the effectiveness of experimentally varying the magnitude of the social normative message that is used to encourage pro-environmental behaviour. In a field-study on transportation behaviour, Kormos, Gifford and Brown (2014) explored the impact of high and low social norms on private car use, and compared this with the travel behaviour of participants in a control condition. The high social norm condition informed participants that "Since 1993, 26% of commuters … have switched to more sustainable mode of transport to campus" whereas participants in the low social norm condition were told that "only 4% of commuters … have made the switch" (Kormos et al, 2014, p.8). Participants in all conditions were set the goal of reducing their private vehicle use by 25%. The results were as expected. The high social norm had a larger impact on behaviour change compared with the low social norm, which, in turn, had a greater effect than the control condition. There were, however, differences in effectiveness according to the type of travel behaviour. Specifically, the high social norm condition decreased private vehicle use for commuting behaviour but had no effect on non-commuting behaviour (see also Eriksson, Garvill & Nordlund, 2008). The authors suggest that normative interventions have a greater potential influence on habitual travel behaviours compared with less habitual behaviours.

In sum, these empirical studies show the powerful effect of social norms on pro-environmental behaviours particularly when an individual's behaviour is markedly different from the norm. These results show that the type of information conveyed about other people can have either positive or negative effects depending on an individual's baseline position. Most importantly, these studies show that there is a need for the descriptive and injunctive norms to be aligned. A misalignment or conflict between norms can reduce significantly pro-environmental intent (see Smith et al, 2012), as well as pro-environmental behaviour (Schultz et al, 2007).

6.2.1.2 Consequent Information Approaches

In contrast to the approaches that give information a priori, consequent interventions provide information, usually in the form of feedback, following performance of the behaviour. The underlying premise, according to feedback intervention theory (Kluger & DeNisi, 1996), is that feedback information provides a link between an outcome and the behaviour change necessary to reach that outcome. Feedback, in various forms, is one of the most commonly used

approaches for promoting energy conservation. It is often conceived as a "learning tool" (Darby, 2006, p.3) as it involves providing households with information about their energy consumption so that they can teach themselves how to change. Feedback is also seen as a way of getting energy-related behaviours into people's conscious decision making so that they see they are in control, and are able to change how they act (Fischer, 2008). Put differently, it is a way of getting people to pay more active attention towards their behaviours, the impact that these have, and raising awareness about the need to change.

Empirical studies exploring the effectiveness of feedback have varied both the type of information provided in the feedback, the frequency of occurrence, the mode of delivery, and the reference point used for comparison (e.g., historical or comparative). Overall, the more frequently feedback is given, the more effective it tends to be (Abrahamse et al, 2005).

6.2.1.2.1 Feedback of different frequencies - monthly, weekly, daily and continuous feedback

Early studies tended to focus on changing how often feedback was provided, varying between a monthly, weekly or daily basis. The studies exploring the effectiveness of monthly feedback suggest that this frequency of feedback has the potential to shift energy consumption habits from on- to off-peak times but the effect does not always result in energy-savings (e.g., Herberlein & Warriner, 1983). Furthermore, the energy-savings made following monthly feedback are often short-lived and have the potential to rebound following withdrawal of the feedback (see Haynes & Cone, 1981; Kantola, Syme & Campbell, 1984). Also, providing monthly feedback through different mediums does not seem to influence its effectiveness. Wilhite and Ling (1995) found no differences in the energy-savings of participants who received monthly feedback in an in-depth report and participants who received feedback in a graphical display.

The results of studies using daily feedback also show a similar pattern. Providing feedback on a daily basis can reduce energy consumption during the intervention period but it is not clear that these changes are maintained in the longer-term, and following withdrawal of the feedback (Seligman & Darley, 1977). There appears to be an immediate positive effect of daily feedback on behaviour regardless of baseline levels of energy consumption (Bittle, Valesano & Thaler, 1979; Bittle, Valesano & Thaler, 1979-1980), but maintaining the changes over time appears more challenging.

To illustrate, Winett, Neale and Grier (1979) compared the effectiveness of daily feedback and self-monitoring on household energy use. The study included a feedback group, a self-

monitoring group, and a control comparison. Households in the feedback group received daily feedback for 28 days. The feedback contained information about the household's daily electricity consumption, the increase or decrease in this consumption compared with baseline levels, progress towards a chosen goal, and the estimated monthly electricity bill based on current usage. Participants in the self-monitoring group were taught how to read their electricity meters and self-recorded electricity use for 4-weeks. The results showed that during the intervention period, households receiving feedback reduced their electricity consumption by 13%, and this was 6% more than households in the self-monitoring group (both groups differed significantly from the control condition). During the follow-up period, the feedback group maintained these changes at a higher rate but these were not maintained post-intervention. In fact, there was a larger behavioural rebound effect for individuals who received the feedback compared with the self-monitoring group.

Feedback that is given on a continuous basis allows an individual to constantly monitor their energy use and the cost of this. The immediacy of this information is thought to help prompt individuals to change their behaviour to be more energy efficient (Faruqui, Sergici & Sharif, 2010; Darby, 2010). In support of this, McClelland and Cook (1979-1980) found that continuous feedback over an 11-month intervention period was effective, and produced a 12% reduction in electricity use in all-electric homes compared with control homes. The authors concluded that the energy monitors that provided the feedback helped to teach residents about the energy associated with different activities so that they were more informed and aware about their energy-consuming behaviours.

Empirical evidence suggests that continuous feedback is also more effective than feedback that is provided less frequently. For example, Van Houwelingen and Van Raaij (1989) found that continuous feedback was more effective than monthly feedback during an intervention period, but 1-year later the positive effects had disappeared. Hutton, Mauser, Filiatrault and Ahtola (1986) also found that continuous feedback was an effective approach for initiating change but not maintaining it in the longer-term.

The introduction of electricity monitors (in-home displays) enables households to receive accurate and up-to-the-minute information on energy-use continuously, and in the longer-term. The information can also be provided for specific energy-consuming behaviours. For example, Wood and Newborough (2003; also reported in Mansouri & Newborough, 1999)

showed that continuous feedback provided by an electronic energy monitor helped people reduce the energy consumed during particular behaviours such as cooking. Participants received different combinations of interventions. For participants receiving feedback, this was provided every 15 seconds. The continuous feedback was the most effective intervention for reducing energy consumption; 70% of households receiving continuous feedback saved >10% electricity in comparison. This was at least 50% more than the energy savings of the other groups. The households who received the information pack were more aware of the complex ways to save energy but this knowledge did not translate to action. In contrast, the continuous feedback motivated people to change their behaviour to save energy.

These results also concur with Ueno, Saeki and Tsuji (2006). Their study used computers to feedback information about total household energy consumption and the energy consumed by each appliance every 30 minutes. The feedback information was presented both graphically and in text form. It was found that households responded positively to the energy monitor and interacted with it frequently in the early stages of the study, however, this interaction decreased dramatically after 1-week. Likewise, the number of energy-saving tips implemented was also higher at the beginning of the study and declined steadily over time. The average total electricity savings per household was 9%. Reductions were seen in heating, TV power consumption, and standby use. The energy-savings of monitored appliances (displayed on an energy monitor) were 7% more than unmonitored appliances. It appears that the energy monitor made households more aware of their energy consumption, and this translated to behaviour changes throughout the household but only for a short period of time. There was, however, wide variation between households and a large degree of heterogeneity in their engagement (see also Murtagh, Gatersleben and Uzzell, 2014).

In sum, it appears that the more frequently feedback is provided, the greater impact it has. This might be because it raises people's awareness sufficiently and enables them to see the impact of their behaviours. However, the effects of feedback are often short-lived and disappear following withdrawal of the feedback. When feedback is provided continuously, it appears that people might become habituated to it and behaviour change effects tail-off over time. This might be because existing habits are too strong to overcome by the provision of information alone.

6.2.1.2.2 Feedback about other people – comparative feedback

The type of information provided in the feedback can also influence the effectiveness of this type of intervention. Comparative feedback provides an individual with information about their behaviour relative to the performance of others. In so doing, it raises an individual's awareness about how their behaviour might differ from other people, and this social comparison might help to initiate change. Like all feedback types, comparative feedback is another way of making pro-environmental behaviours 'visible'.

Comparative feedback has been used frequently to encourage pro-environmental behaviours. Although overall conclusions are generally positive, the details show a more mixed picture. When compared with feedback of different types, comparative feedback has been shown to be more effective for high-energy consumers but not for those who are low consumers. In a comparison of different types of feedback, Brandon and Lewis (1999) found that comparative feedback was effective at lowering energy consumption for medium and high users but there was an opposite effect for low consumers. These individuals increased their consumption levels (+10%) following comparative feedback (see also Kurz, Donaghue and Walker, 2005; Bittle et al, 1979-1980).

More positively, Staats, Harland and Wilke (2004) used comparative feedback in a group setting as part of their EcoTeam Program (ETP). Participants were placed in small EcoTeams of 6-10 people to discuss an environmental household behaviour each month (gas, electricity, water, transport, garbage, and consumer behaviour). At each monthly meeting, participants received feedback that compared their performance in relation to the other teams. This was found to be an effective way of increasing pro-environmental behaviours during the 8-month intervention period and enabled participants to maintain these changes during the 2-year follow-up. The control group showed no such changes. Regarding electricity and gas consumption, EcoTeams decreased these by 20.5% and 4.6%, respectively. The changes were also maintained in the longer-term and 2-years later they equated to a 16.9% decrease for gas use and 7.6% for electricity. Substantial reductions were also shown for other pro-environmental behaviours such as waste disposal and water consumption.

Staats et al (2004) found that the strength of social influence played an important role in getting people to change their pro-environmental behaviour, but its impact was partially mediated by the strength of existing habits. The EcoTeams that exerted a strong social influence were able

to encourage pro-environmental behaviours regardless of existing habit strength, whereas those that exerted a weaker social influence were only able to influence people with weaker habits. The results highlight the powerful effect of other people and habits on supporting and constraining pro-environmental behaviour change and suggest again that behaviour interventions need to target habits directly (see also Toner, Gan & Leary, 2014)

In sum, comparative feedback is an effective way to encourage pro-environmental behaviour change in individuals who are less pro-environmentally engaged. However, for individuals who are already environmentally disposed, comparative feedback can have a negative influence on behaviour and decrease pro-environmental activity. The relevance and strength of the social reference group can determine whether comparative feedback is effective enough to overcome existing habits. Staats et al.'s study (2004) suggests that providing comparative feedback incrementally in a structured way might be the most effective approach.

6.2.2 Goal-enhancing Approaches

6.2.2.1 Commitment

Commitment is a popular approach to behaviour change that is thought to yield substantial and durable effects on behaviour (Lokhorst et al, 2013). The influence of commitment is often substantial in the sense that the change is often large enough to have an environmental impact, and the impact is durable in the sense that the change will last in the long term, without the need for reminders or further interventions (Cialdini, 2001). Commitment involves asking people to make a pledge or promise to do something. It has been used frequently as a method to encourage pro-environmental behaviours.

Getting people to make a commitment is important for initiating behaviour change. Without commitment people might contemplate change but might not be fully prepared or ready to take action (Prochaska et al, 1992), and this might be because they are unaware of the need or opportunity to change. Commitments are conceived as an internal source of control for behaviour. They can be likened to a behavioural contract that an individual makes for himself or herself. Some researchers have suggested that commitments have a stronger and longer lasting influence on behaviour across different situations compared with external sources that might be more transient and context specific (Dwyer et al, 1993). Commitment might, therefore, be particularly relevant for the development of environmentally sustainable

lifestyles where there is a need to have a salient factor that anchors multiple pro-environmental behaviours across different contexts and circumstances.

Commitment interventions (based on commitment manipulations) have been implemented successfully across a range of pro-environmental behaviours. They have been effective at encouraging recycling (e.g., Bryce, Day & Olney, 1997; Cobern Porter, Leeming & Dwyer, 1995; Werner, Turner, Shipman, Twitchell, Dickson, Bruschke et al, 1995); changing travel mode choices (Bachman & Katzev, 1982; Matthies, Klöckner & Preissner, 2006); reducing water consumption (Dickerson, Thibodeau, Aronson & Miller, 1992); and saving energy (Pallack & Cummings, 1976).

Commitments can be made in different ways and this can influence their effectiveness. They can be either verbal or written, and made privately, like a promise to oneself, or publicly. Public commitments have been found to be more effective than private commitments (DeLeon & Fuqua, 1995; Matthies et al, 2006). For example, in Pallack and Cumming's study (1976) participants, who were randomly assigned to make a public commitment (by signing in a leaflet) to reduce gas and electricity consumption, had smaller increases in their energy consumption levels (89%) compared with the private commitment group (108%) or control group (114%). This effect continued following termination of the intervention over a period of 6 months. A follow-up study, which tracked energy usage for a 12-month period, also confirmed that making a public commitment to conserve energy was more beneficial in the longer-term too (Pallack, Cook & Sullivan, 1980).

The behaviour change interventions that use a commitment approach have typically been implemented in two ways: commitment only (at different degrees), and commitment plus another intervention. In two different studies that sought to encourage individuals to reduce household energy consumption, Katzev and Johnson (1983; 1984) compared a commitment only intervention with a control group (study 1), and a commitment plus a small financial incentive intervention with a control group (study 2). Energy consumption was measured during a 2-week intervention period and 12-week follow-up period. Those individuals who made a commitment, regardless of whether this was made independently or in conjunction with an incentive, saved more energy in comparison with the control group. There was no difference between the energy-savings of the two intervention groups but the beneficial effects occurred at different time points; the effects were observed during the intervention period in

the first study (commitment only) and during the follow-up period in the second study (commitment plus financial incentive).

A recent meta-analysis of 19 studies (Lokhorst et al, 2013) concluded that commitment techniques (either commitment only or commitment plus another treatment) were more effective than control conditions during behaviour change intervention periods and at follow-up. There was very little difference in the effectiveness of the different commitment techniques at either time point (during intervention: r = .27 for commitment only and r = .31 for commitment plus another treatment, and during follow-up: r = .18 for commitment only and r = .26 for commitment plus another treatment). The results were less conclusive about the effectiveness of commitment in comparison with other intervention techniques.

In sum, it appears that commitment-making can be an effective way of getting people to change their behaviour, and if an individual persists with the behaviour over time, then attitude change is more likely to happen and make the new behaviour more permanent (see Werner et al, 1995). Making a commitment might help to establish environmental concerns in the "attentional set" of the target audience, and make people more aware of the need to change. However, often commitments do not provide any information on the ways in which people could go about changing their behaviour. As discussed previously, people with low levels of self-efficacy (Bandura, 1994) might not believe that they are capable of changing behaviour because they do not believe they have the skills and abilities for its successful implementation.

Research suggests that even wholly committed individuals might find it difficult to commit to long-term goals even when they are self-benefitting (e.g., Polivy, Herman, Hackett & Kuleshnyk, 1986). One possible reason is that being committed to change behaviour is somewhat dependent on self-control and the ability to override established patterns of behaviour, which might be characterised by habit. The energy imbued in change efforts can deplete resources within the self and reduce a person's capacity for subsequent self-control tasks (Baumeister, 2002). Being committed to develop a more environmentally sustainable lifestyle requires sustained efforts to change multiple behavioural patterns over time. This is likely to be resource depleting and unmanageable in the longer term, which might leave the individual open to the possibility of impulsivity and behavioural rebound effects that can be counteractive to the initial intention (Swim et al, 2009).

Lastly, not all individuals are willing to make a commitment. DeLeon and Fuqua (1995) found that an average of 36% of the participants did not make commitments when directly asked to do so (see also Wang & Katzev, 1990; Matthies et al, 2006). If commitment manipulations are used to encourage behaviour change, then researchers need to consider the most effective ways of getting participants to commit to take action, as well as the most effective commitment-enhancing manipulation.

6.2.2.2 Goal setting

Goal-focused approaches to behaviour change are based on goal setting theory. This states that individual behaviours are goal-directed and the anticipation of reaching an attractive goal motivates behaviour. To be effective, goals should be challenging but realistic. They should also be specific or clearly formulated and achievable within a short period of time (Locke & Latham, 1990). Being committed to a goal is important for its achievement, as is setting realistic goals that are achievable; the two are inextricably linked (Shapira, 1989). An imbalance in these, for example, setting goals that are unattainable, could lead to a negative cycle of poor motivations, pessimistic self-perceptions and feelings of helplessness. Poorly formulated goals might have a negative impact on self-efficacy (Bandura, 1994). On the contrary, knowing that a goal is achievable is motivating and inspiring, and furthermore, attaining a goal is fulfilling and rewarding; it helps to spur action for future aspirations.

The use of goal setting as an approach for pro-environmental behaviour change has often been used in combination with other methods rather than independently. The goal element involves specifying a target amount of energy to save. This can vary according to its degree of difficulty and focus (individual- or group-based).

Becker (1978) investigated the effect of personal goal setting on household energy-conservation behaviour. Two groups of households were set an easy (2%) or difficult (20%) goal either on its own or in combination with feedback about electricity consumption (given three times a week). Information about the energy-consumption of different appliances was also provided to all groups; this was the only measure given to the control group. The results show that setting a difficult goal in combination with feedback proved most successful and resulted in the only significant reduction in electricity consumption compared with the control; households in this group saved 15%. Interestingly, the easy goal was in no way effective, nor was setting a goal without feedback.

Using a goal in combination with feedback appears particularly effective but it is important to consider how the goal aligns with the social value orientation of the individual. In an experimental design, McCalley and Midden (2002) randomly assigned participants to one of four conditions; feedback with no goal, feedback with a self-set goal, feedback with an experimenter-assigned goal or a control group with no feedback or goal. Each participant completed 10 washing trials and feedback about the amount of energy (kWh) consumed on each trial was provided immediately for the groups. The results showed that the goal-feedback combination was found to be the most effective for both goal-setting groups; the self-set and assigned goal groups reduced their energy use by 22% and 19%, respectively. Furthermore, aligning goals in accordance with social-value orientations also proved important; pro-self individuals saved more energy when they self-set their goals and pro-social individuals were better energy savers when they were assigned a goal.

As Steg, Bolderdijk, Keizer and Perlaviciute (2014) observed, pro-environmental behaviour often involves a conflict between the different goals that a person pursues. Goal framing theory (Lindenberg & Steg, 2007) suggests that three different types of goal governed pro-environmental behaviour. There are: hedonic goals, which encourage individuals to focus on improving their feelings in a particular situation; gain goals, which prompt people to focus on the resources they have (e.g., money) and; normative goals, which encourage people to focus on the appropriateness of their actions and consider what other people might think. Steg et al (2014) suggest that all of these goals have an influence on what people attend to and the information that they process and that they have most accessible when directing behaviour in specific situations. In relation to pro-environmental activity, the development of normative goals can help to encourage pro-environmental behaviour in the longer-term compared with the alternative approaches of decreasing the hedonic and gain costs of pro-environmental choices (Steg et al, 2014).

In sum, it appears that goal setting, particularly in combination with feedback, is an effective strategy for pro-environmental behaviour change. On a practical level, the use of implementation intentions or if-then plans that spell out the course for goal achievement (when, where and how) might also be additionally effective to ensure that plans are put into action (Schweiger Gallo & Gollwitzer, 2007) and set goals translate into behaviour change. This might be because they offer a more direct volitional strategy for directing action (see also

Gollwitzer & Oettingen, 2014). Furthermore, the use of normative goals might have longer-term advantages over hedonic and gain goals (Steg et al, 2014).

It is suggested here that goal setting might be an effective first step in pro-environmental behaviour change interventions. By actively setting goals, individuals are encouraged to become more aware and pay more attention to their existing pro-environmental behaviours and the impact that these have, as well as highlighting where they would like to change behaviour. This might, then, encourage people to draw their attention away from their core proximal goals, which might not be pro-environmentally focused, towards more environmentally friendly alternatives so that environmental concerns that encourage behaviour change become embedded in the "attentional set" of the individual (see Page & Page, 2014a). Furthermore, goal setting might help distal environmental goals to become more proximal (see Tate, Stewart & Daly, 2014).

6.2.2.3 Rewards and incentives

The psychological model of behaviour underpinning reward-based approaches to change is operant conditioning (Skinner, 1953). According to operant conditioning frameworks, change happens through the development of an association between behaviour and the consequence for that behaviour. In the case of pro-environmental behaviour change, the reward that is often offered is monetary.

Reward-based studies of pro-environmental behaviour change were popularised in the 1970s and 80s. In these studies rewards were often paired with other intervention approaches rather than presented independently. The size of the reward also varied. For example, Winett, Kagel, Battalio and Winkler (1978) used both high and low monetary rewards in combination with information and weekly feedback to encourage residents to reduce their household energy consumption. They found that both small and larger monetary incentives encouraged householders to save energy during the intervention period but they did not collect data to see whether the changes were maintained in the longer-term, when the rewards were withdrawn.

Another study has suggested that when rewards are used to elicit behaviour change, pro-environmental behaviours might not be maintained in the longer-term. McClelland and Cook (1980) offered a group reward for residents of master-metered apartments. They set up a contest between apartment blocks and offered a reward to the block that saved the most energy. The offer of a reward was provided in combination with information on how to save

energy (at baseline) and weekly feedback on their own and the others' energy consumption. McClelland and Cook (1980) found that there were significant and substantial (10%) energy-savings initially but this dropped-off steadily in later weeks. This study, and others alike (Slavin, Woodarski & Blackburn, 1981), shows that monetary rewards can have a short-term effect at motivating collective energy-saving efforts. Other studies have, however, found that monetary incentives are detrimental to pro-environmental behaviours and can increase carbon emissions (see Eccles, Ioannou, Xin Li and Serafeim, 2012).

Overall, the empirical studies that have investigated the effectiveness of incentives to encourage pro-environmental behaviours suggest that they might be an effective intervention over a short period of time but they might be ineffective at supporting behaviour change in the longer-term. Once incentives and the reward contingency are no longer available, behaviour practices often revert back to old habits. The limited effectiveness might be because rewarding pro-environmental behaviour does not equip people with the cognitive and behavioural skills they need to challenge existing habits repeatedly in different contexts and in the longer-term.

6.2.3 Community Approaches

Community or group-based interventions like the EcoTeams approach described previously (e.g., Staats et al, 2004), are becoming an increasingly popular way to encourage performance of pro-environmental behaviours. Unlike most of the interventions outlined previously, they focus on bringing people together to collaborate (rather than focusing on the individual in isolation) in order to promote pro-environmental behaviour through supportive social networks and facilitated discussions. They typically involve a small group of people from a local community (e.g., neighbourhood, workplace) meeting regularly to receive information about how they can make their life more environmentally sustainable. The information, which is usually presented in a workbook, is explored and discussed at the group meetings in coordination with a trained "expert". Discussions are directed towards "reducing the environmental impact of participants' lifestyles" (Fisher & Irvine, 2010, p.51) for instance, by reducing the amount of waste thrown out in the rubbish or lessening electricity and water use. Participants report back on their performance and share their successes.

In their literature review on community interventions, Fisher and Irvine (2010) describe the EcoTeam approach alongside 3 other established approaches; the Global Action Plan (GAP), the Carbon Reduction/Rationing Action Group (CRAG) and the Green Streets programme

conducted by British Gas. The most well established and empirically researched of these approaches is the GAP.

6.2.3.1 Global Action Plan - GAP

Although GAP has existed in the UK for 20 years, empirical work on its effectiveness for reducing household electricity consumption is only more recently being reported (e.g., Hargreaves, Nye & Burgess, 2008). As with the components outlined above, GAP has the following active components: 1. "action teams" from the community, 2. facilitated discussions with a trained or semi-trained expert, 3. monitoring of rubbish disposal/electricity consumption etc, and 4. feedback regarding progress. The EcoTeam arm of GAP is designed to make home behaviours more environmentally sustainable. Others, such as Environment Champions and Action at School, tackle work- and school-based sustainability issues, respectively.

Hargreaves et al (2008) found that the GAP EcoTeam approach was an effective method for encouraging more sustainable behaviours at home. During the programme, groups of 6-8 participants met once a month for four months to discuss changing their behavioural habits and lifestyles for the purpose of reducing energy consumption. This was then followed-up with homework; participants tried the changes suggested at the meeting and monitored the impact these had on waste disposal, recycling, and electricity consumption. They used the workbook to record their observations. Essentially, the programme adhered to the following process: learning-experimentation-observation-reflection-discussion-feedback. Hargreaves et al (2008) found that this method of behaviour change was successful. The results showed that there were substantial reductions in solid waste disposal (-19.66%) and electricity consumption (-6.86%), and increases in recycling (+7.71%). There were, however, large variations in the minimum and maximum values. This suggests that there were very different levels of engagement with the approach. The successes in changing behaviour were attributed to the combination of information, feedback, and social interaction. It was concluded that EcoTeams are an effective community-approach for engendering lifestyle change in the short-term however, the long-term effectiveness of the approach is yet to be established, as is its impact on lifestyles that are more unsustainable at baseline, and with individuals who are less motivated to change. At present, it is not a cost-effective approach to change because of the small and homogeneous group of people that it attracts (Davidson, 2009).

6.2.3.2 CRAG

The CRAG approach is more informal than GAP but is based on similar principles. Unlike GAP, CRAGs have no particular model on how to function, and the meetings are not facilitated by a trained expert. Participants decide how often to meet, what to discuss, and how to record lifestyles changes. There is information available from the CRAG website to support this. Howell (2009) evaluated the effectiveness of this approach and found that it helped people to improve the environmental sustainability of lifestyle practices (reduce waste, carbon emissions and water use). The results showed a 27% reduction in overall carbon emissions. Similar to the EcoTeam approach, CRAG also tends to attract individuals who are more pro-environmental to start with, and at baseline in this study they had carbon emissions that were 6% lower than the national average.

6.2.3.3 Green streets

The 'Green Streets' energy campaign sponsored by British Gas included a less homogeneous group of people. The 'community' was formed around a neighbourhood location with participation from 64 households from eight different streets. Each street formed a neighbourhood team and competed against every other team to effect the most lifestyle changes and achieve the largest reduction in carbon. In order to make the changes, each household had access to an energy advisor who provided information and answered queries. The teams also met to discuss and share information, and British Gas provided £30,000 of funding to each group for use on household improvements, which included a mandatory element of renewable energy generation. Feedback on progress was provided by meter readings collected by British Gas. The approach was a success and over the year-long trial; households reduced their energy consumption by 25% on average, although there was a large degree of variability (Lockwood and Platt, 2009).

The changes were largely due to the behaviour changes made by the participants. Lockwood and Platt (2009) reported that 50% of the energy-savings were attributable to behaviour changes. Furthermore, participants reported that they adopted at least 13 new pro-environmental behaviours as part of the programme. Unlike the EcoTeam and GAP studies, participants in the Green Streets initiatives were no more environmentally conscious than the national average, but the money available offered a sufficiently attractive incentive to participate.

In sum, community-based approaches appear to offer a promising and more eclectic approach to pro-environmental behaviour change. Future research needs to support their development and consider how they can be made more appealing to individuals who are less engaged with pro-environmental issues.

6.3 Discussion

The purpose of this review was to identify and evaluate the effectiveness of popular and historical approaches to pro-environmental behaviour change. The different intervention techniques were broadly categorised as follows: knowledge development, goal enhancement, and community support. It seems that the interventions that seek to develop knowledge, through the provision of information in various forms (e.g., feedback, tailored and standard information, modelling and norms), can help to raise people's awareness of their current behaviours, the need to change this, and the alternative behavioural options that are available. Knowledge-based intervention approaches have an impact on behaviour in the short term-term but do not always result in long-term behaviour change.

Similarly, goal-enhancing approaches help to direct people's attention away from their core proximal goals, which might not be pro-environmentally focused, towards more environmentally friendly alternatives. By doing so, they help to raise the importance of environmental concerns in an individual's "attentional set" so that they are more aware of the need to change their behaviour as well as the ways in which they are able to change. As per information-based approaches, they do not, however, offer volitional strategies for change.

The community-focused approaches offer a more novel and promising approach to pro-environmental behaviour change. Their development has made a step-change in the offering of pro-environmental behaviour change interventions, and although they are less well evaluated empirically, it seems that they have real potential to help people develop lifestyles that are overall more environmentally sustainable. Further research should focus on making them more appealing to a wider audience, so that they also attract individuals who are less pro-environmentally disposed.

6.4 Conclusions

In sum, this review shows that there are many different approaches to pro-environmental behaviour change but, with community-based approaches as the exception, most interventions

seem to be of a similar type. Researchers have tended to focus on developing the validity of established approaches, rather than considering their true utility. Consequently, they have repeated similar intervention designs, with slight modifications and extensions, and have become, perhaps, inattentive to the value of more novel approaches (see also Ogden, 2014; Chatterton & Wilson, 2014). Moreover, many of the established approaches have been developed from the perspective of bounded rationality and assumed that the provision of information, in various forms, will initiate behaviour change. As discussed extensively so far throughout this programme of research, there is not always a direct relationship between information and behaviour (Webb & Sheeran, 2006) because of the powerful network of habits in thinking, feeling, and behaviour. Targeting just one component of the network in isolation to the other components is unlikely to be strong enough to overcome the web of habits. People might not have sufficient levels of self-efficacy to think that they can change successfully. It is, therefore, proposed that behaviour change interventions also need to target directly and simultaneously the powerful effect of established habits in behaviour, thinking and affect, and offer volitional strategies to help people change their behaviour directly, rather than getting them to think about change.

Although this research has not confirmed any of the established approaches particularly effective, it has, in conjunction with the empirical studies, identified some of the complexities of pro-environmental behaviour and the challenges that researchers face when trying to effect pro-environmental behaviour change. In so doing, it has highlighted the need for further research to support the development of new intervention techniques that although might be less explored empirically, offer a greater potential to change behaviour.

7 Developing an Integrated Conceptual Framework of Pro-environmental Behaviour Change using the FIT Framework

7.1 Introduction

The studies in this programme of research have elucidated a relationship between levels of personal FITness and pro-environmental activity. Overall, the relationships between FIT variables and pro-environmental behaviour have been positive. This suggests that individuals with higher levels of FITness, particularly FIT Integrity, are more pro-environmental in their approach. Following on, therefore, these results also suggest that developing levels of personal FITness might be an effective approach to encourage pro-environmental behaviour. Based on these findings, this Chapter proposes a new conceptual framework of pro-environmental behaviour change by combining the insights of the literature reviews and the results of the empirical studies. The proposed framework will, it is believed, provide further insight into the factors that influence pro-environmental behaviour and consider how these might be challenged and developed to encourage individuals to behave more pro-environmentally. The proposed model will form the basis for further research to evaluate empirically the effectiveness of an intervention adapted from the generic FIT-Do Something Different approach. Unfortunately, an empirical evaluation of the proposed intervention, named Do Something Greener, is beyond the scope of this programme of research.

7.2 Insights from the Empirical Studies and Implications for Behaviour Change

7.2.1 The Benefits of Developing Personal FITness

The pattern of results found throughout this programme of research suggests that personal FITness levels do relate to an individual's cognitive and behavioural engagement with pro-environmental activity. The relationships suggest that an individual's Cognitive Constancies are more influential than their degree of Behavioural Flexibility but this does not mean, however, that being behaviourally flexible is unimportant or that the proposed approach to pro-environmental behaviour change should only focus on developing an individual's cognitions. Previous discussions have identified the interrelationships amongst behaviour, cognitions, and affect, and have attested the need for a broader approach to pro-environmental behaviour

change that considers each of these components simultaneously. This would present a different approach from the single-track interventions that have been used historically.

The empirical studies presented throughout in this programme of research have shown that Behavioural Flexibility has a less consistent relationship with established patterns of pro-environmental thinking and behaviour. In retrospect, this is, perhaps, not too surprising. It may just indicate that people behave fairly habitually, whether or not their habits are pro-environmental. Indeed, the low distribution of Behavioural Flexibility scores suggests general patterns of behaviour are fairly fixed. If this is the case more generally, then it will be important to focus interventions on enhancing the Behavioural Flexibility of the habitually "non-green", leaving the habitually "green" to continue in their largely environmentally sustainable routines.

The influence of habit on pro-environmental behaviour was discussed and explored empirically in Chapter 5. It seems counterintuitive to disrupt the behaviour patterns of those individuals who are habitually environmentally sustainable in their approach, simply to make them more flexible. They have, after all, established patterns of behaviour that are pro-environmental. However, a sufficient level of Behavioural Flexibility might be more important for supporting individuals to change behaviour to become more pro-environmental, than it is for them to be pro-environmental per se. This would suggest that enhancing Behavioural Flexibility might make it easier to encourage those with non-green behaviour to become more pro-environment, a hypothesis that deserves further investigation. The purposeful development of Behavioural Flexibility might, therefore, be a necessary pre-cursor to support individuals who are habitually non-green towards a more pro-environmental disposition. The behaviour change framework proposed here will seek to develop levels of Behavioural Flexibility through a structured programme of small behavioural experiments that offer volitional strategies for changing behaviour directly (Armitage, 2014).

In consideration of the powerful role of habit in cognition and behaviour, and in separating behaviours from cognition (Klöckner & Blöbaum, 2010) and intention (Armitage & Conner, 2001), the proposed model of behaviour change will target behaviour directly by getting people to act out new behaviours rather than getting them to think about performing these. (Many established interventions do the latter through the provision of information.) This might help to align behaviour with cognitions and overcome (by rendering them irrelevant) the 'gaps' between values, intentions, and actions that are often evident in efforts towards pro-

environmental behaviour change (Blake, 1999). Across 47 experimental tests, Webb and Sheeran (2006) found a medium-to-large change in intention often resulted at best in a small-to-medium change in behaviour (Abraham, 2014). It seems that despite being sufficiently motivated to change their behaviour, individuals need volitional strategies to help translate their intentions into action (Bélanger-Gravel, Godin & Amireault, 2013). The Do Something Greener intervention targets behaviour directly, rather than via intentions, by getting individuals to try new behaviours daily through a structured programme of habit reversal and new habit rehearsal.

The results of the empirical studies presented in Chapter 4 suggest that for individuals with lower levels of personal FITness, pro-environmental activities are perceived to have a stronger relationship with external factors and, therefore, might be more susceptible to changes in the context and external environment. Context factors, such as cost and finances, policies and procedures, and other people's attitudes and behaviours, were perceived to have a larger influence on the pro-environmental behaviours of these individuals compared with the pro-environmental behaviours of individuals with higher levels of FITness. Intrinsic factors such as beliefs about climate change and the need to behave pro-environmentally and make a difference, were perceived to have a stronger influence on the behaviour of individuals with higher levels of FITness (see Table 7.1). These results give some indication about where it might be useful to target behaviour change, and how developing the Cognitive Constancies might support this. It is both theoretically and empirically apparent that all of the Cognitive Constancies might relate to pro-environmental action in some way and therefore, in the pursuit of developing pro-environmental behaviours, it might be particularly beneficial to target interventions at enhancing all of the Cognitive Constancies.

As well as seeking to enhance directly the Cognitive Constancies, it is just as possible that a change in behaviour can prompt a change in thinking as vice versa. Indeed, therapeutic techniques such as Cognitive Behavioural Therapy (CBT) have effectively encouraged progress in clinical populations by focusing first on behaviour and then cognitions. The FIT Framework (Fletcher & Stead, 2000) also suggests that Cognitive Constancies can guide effective and flexible decision-making and behaviour, and in return, the experiences that are encountered can, through behavioural feedback, help to develop the Cognitive Constancies further. The strength of the bidirectional relationship, particularly the effect of actions on thoughts, has

often been underplayed in other models of behaviour and interventions for pro-environmental behaviour change.

The FIT Framework (Fletcher & Stead, 2000) suggests that the cognitive Constancies provide the foundation for action; they guide decision-making and behaviour. As such, they can act as a direct or indirect target for behaviour change interventions. A direct approach to change would seek to develop the strength of each Constancy in order to lever changes in behaviour. This is the approach supported by most existing psychological models of behaviour and frameworks for behaviour change (see Chapter 1). People are told what to do and then left to get on with it (see also Chapter 6). However, as discussed previously, this method does not always result in new patterns of behaviour and can often result in a 'gap' between intention and action (Klöckner & Blöbaum, 2010), and only a small change in behaviour (Webb & Sheeran, 2006). One reason might be because existing habits are often too strong to overcome by thinking alone. Therefore, an alternative approach to pro-environmental behaviour change would be to change cognitions indirectly by developing behaviour. According to this perspective, which subsumes an action-oriented approach, behaviour is targeted directly to leverage indirect changes in thinking. This approach draws on the techniques of Cognitive Behavioural Therapy, particularly its Behavioural component.

Table 7.1. A summary of the factors that are perceived to influence pro-environmental behaviours for individuals with lower and higher levels of FITness and their relationship to the Cognitive Constancies

	Influencing factor	**Cognitive Constancy**
Lower FITness	Belief there is a need to act pro-environmentally	Awareness/Conscience
	The influence of other people	Balance/Fearlessness
	The influence of costs/finances	Balance/Fearlessness
	Respect and adherence of policies and procedures	Fearlessness/Self-responsibility
	Willingness to make a difference	Balance/Conscience
Higher FITness	Belief in the reality of climate change	Awareness/Conscience
	Belief in the need to act pro-environmentally	Awareness/Conscience
	Belief that acting will make a difference	Conscience/Fearlessness
	Feeling responsible	Self-responsibility
	Knowing how to behave pro-environmentally	Balance/Fearlessness
	The influence of other people	Balance/Fearlessness

7.2.2 Breaking the Relationships between Habits, Opportunities and Thoughts

With consideration to the network of habits in cognitions, behaviour, and affect, there appears to be a clear rationale for why a FIT-based Do Something Different intervention, which directs structured development in both thinking and behaviour, might be a more effective approach to pro-environmental behaviour change compared with the information-based interventions used historically. The existing network of habits in thinking, affect, and behaviour is often too powerful to overcome by a single approach, such as increased knowledge or implementation intention. This is because the development of knowledge, for example, might only address one dimension of the habit network – cognitions. The provision of information can make people more aware of the opportunities they have available for change, but it does not help to develop their personal beliefs about their ability to change behaviour. Without sufficient strength in self-efficacy, people might not believe that they have the capability or opportunity to change, despite knowing what actions to take. Such negative automatic thinking or more appropriately here, negative environmental thinking, can significantly impair personal beliefs in one's ability to change. It only takes one negative environmental thought to block change entirely (see Page & Page, 2011).

Established behavioural habits can also reinforce the negative relationship between thinking and beliefs. The automaticity of established habits means that people are less cognitively alert: they might be less aware of their actions, the environmental impact that these have, and the alternative courses of action that are available. In other words, they develop "tunnel vision" (Walker et al, 2014), which makes them less receptive and responsive to behaviour change information, and can initiate further the development of negative beliefs about their ability to change (see Page & Page, 2014a). The Do Something Greener intervention proposed here offers volitional strategies for initiating change that are encompassed in daily behavioural experiments called Dos (Armitage, 2014). These are intended to challenge the habit cycle and support people to be both psychologically and behaviourally ready to implement change in their transition towards a more environmentally sustainable life.

7.2.3 The Framework of FIT-Do Something Greener

Historically, the FIT-Do Something Different behaviour change approach has used both an indirect and direct approach to support generic behaviour change. It has simultaneously targeted cognitions and behaviour (i.e., behaviour independent of cognitions) and considered

the bi-directional relationship between the two of these. In light of the empirical findings, it seems appropriate to use a similar approach for pro-environmental behaviour change. Therefore, the proposed Do Something Greener intervention will seek to change behaviours and cognitions both directly and indirectly.

Using small behavioural experiments, Do Something Greener targets cognitions and behaviours by taking participants through a structured change process based on habit reversal and new habit rehearsal. The intent is to encourage participants to experiment with new behaviours, to try new and different ways of behaving, in order to challenge existing patterns of thinking and behaviour. This, it is suggested (Fletcher & Stead, 2000), helps to expand the size of an individual's behavioural repertoire. Through experimenting with new behaviours, people might be better equipped to weaken their existing habits (characterised by Fletcher & Stead, 2000 as "habit-webs") and they might also encounter new experiences that could challenge current thinking (see Page & Page, 2011; 2014a).

Importantly, these habit reversal and new habit rehearsal tasks are not always focused on the behaviour that is the target of change. This is one distinction between this intervention approach and many of the preceding ones. There is no necessity for all, or for even a majority of the new behaviours to have anything to do with the target behaviour, in this case pro-environmental activity. The driving credo is that habits are not independent from one another, but exist in a mutually supporting network of habit-webs (cf. Neal et al, 2006) and routines. By breaking down the distal habits (the fixed routines of daily life) that form the habit-web in which the proximal target habits (e.g., pro-environmental behaviours) reside, the Do Something Greener intervention seeks to enhance both generic flexibility and pro-environmental activity specifically. It seeks to put people into a psychological place in which they can change anything about themselves, before attempting to change any particular habit. As such, the proposed behaviour change framework comprises behavioural experiments at a generic level, designed to reinforce the belief that flexibility and change are a defining feature of a true comfort zone, as well as behavioural experiments that target specifically pro-environmental activity.

As discussed previously, there have been some practical applications of the FIT Framework to a range of psychological and social outcomes including stress, weight loss, and family functioning (Fletcher & Stead, 2000; Fletcher et al, 2011; Sharma, 2011). The behaviour change approach offered by the FIT Framework is, by nature, generic, and has applicability to many

different types of behaviour. It offers a different perspective on the personal characteristics that relate to pro-environmental activity. The results of the empirical studies presented throughout this programme of research suggest that it could also be a useful and effective alternative approach to encourage pro-environmental behaviour. The Do Something Greener intervention proposed here has, in accordance with the results of the empirical studies and literature reviews, been adapted from the generic Do Something Different framework in order to enhance its application to pro-environmental activity.

7.3 Insights from Established Intervention Techniques and Implications for Do Something Greener

Established behaviour change interventions are a good starting point for developing new approaches. Chapter 6 reviewed in detail many of the techniques that have been used historically. The following section summarises some of the general insights that emerged from this review, and considers their usefulness in the design of the Do Something Greener intervention.

- Regular provision of tailored information is an effective way to initiate change across different contexts (Revell, 2014; Daamen et al, 2001) but it can be an expensive method when the information is disseminated during site visits from energy experts (see Dowd & Hobman, 2013). The Do Something Greener intervention can be implemented using electronic sources to provide a more cost-effective way of disseminating tailored information on a regular basis.
- Providing regular, but not continuous, feedback on progress is important (see Murtagh et al, 2014), and effective if delivered in a structured way (Staats et al, 2004). Knowing how other people behave (comparative feedback) helps to engage individuals who are less pro-environmental but for those who are already environmentally disposed, it is important to provide both descriptive and normative information in order to prevent unintended boomerang effects (see Schultz et al, 2007; Smith et al, 2012). The Do Something Greener intervention offers a 'green' audit as a baseline measure for directing change. This contextualises the range of appropriate behaviours.
- Making commitments to change is often ineffective but setting challenging but realistic normative goals in conjunction with clearly defined implementation intentions often helps people to initiative change, and maintain the effects in the longer-term (Steg et al,

2014; Schweiger et al, 2007). The Do Something Greener intervention provides a structured programme of small behavioural experiments – a green action plan – that is tailored according the results of the baseline audit. This enables participants to scaffold their actions around priority areas.

- Community approaches to pro-environmental behaviour change offer a more eclectic approach to change but seem to only appeal to those individuals who are already environmentally focused (see Hargreaves et al, 2008). The Do Something Greener intervention includes group-based activities that differ in their degree of difficulty. It allows participants to choose which activities they complete so that they can tailor their programme, and are not deterred by more challenging activities. It is hoped that this will encourage engagement at different levels across households and organisations.
- Change should be undertaken in small steps, which then become incrementally more challenging over the course of the intervention (see Prochaska & DiClemente, 1983; Bamberg, 2013). This 'foot-in-the-door' technique has been found to be a more effective way of getting engagement and maintaining change in the longer-term (Thørgersen & Crompton, 2009). The Do Something Greener intervention guides participants through a phased programme so that change is progressive and achievable.

7.4 The Do Something Greener Intervention Study

As an empirical evaluation of the Do Something Greener intervention is beyond the scope of this programme of research, the rest of this Chapter describes in detail the proposed design of the Do Something Greener behaviour change programme and the associated study design that is planned for future research.

7.4.1 Proposed Study Design

An empirical evaluation of the effectiveness of the Do Something Greener intervention would, ideally, be a randomised control trial with participants randomly allocated to one of the available conditions. In order to test whether there is an additional benefit of the specificity of the Do Something Green programme in comparison with the generic Do Something Different approach, three conditions are necessary. These are as follows: 1. the Do Something Greener condition (as previously outlined and described in detail below); 2. the Do Something Different condition (as described below); and 3. a control condition where participants record their everyday behaviours but do not receive any Dos. Regardless of their condition, all participants

would receive and complete the pre- and post-intervention diagnostics and the daily diaries for recording their activities (see Table 7.2 for an outline of the intervention design). As the purpose of the research is to encourage participants to become more pro-environmental in their approach, participants in the generic Do Something Different condition would receive the 'green' Dos at the end of the study, and participants in the control condition would receive the full Do Something Greener materials also.

7.4.2 Proposed Materials/Study Conditions

7.4.2.1 Do Something Greener programme

As described previously, the Do Something Greener intervention is based around a framework of Dos. The Dos are pre-specified activities, or small behavioural experiments, designed to direct new behaviours and ways of thinking. These are designed to counter habitual tendencies, and to help individual's develop their pro-environmental activity, general behavioural repertoire, and levels of personal FITness both on a generic level and towards pro-environmental activity directly. The Dos encourage people to change the way they typically do things rather than getting them to think about how they might do things differently. The Dos are designed to help people weaken existing habits – habit reversal – and also to help develop behavioural repertoires by trying new behaviours and different ways of behaving – new habit rehearsal.

The Do Something Greener behaviour change programme specifies 245 different Dos structured around the Cognitive Constancies and dimensions of Behavioural Flexibility. There are five generic Dos for each Cognitive Constancy (5 x 5 = 25) and for each dimension of Behavioural Flexibility (30 x 5 = 150) and a further two 'green' Dos in each of these areas. This makes a total of 35 Dos for the Cognitive Constancies, 10 of which are 'green' Dos, and 210 Dos for Behavioural Flexibility, 60 of which are 'green' Dos.

As part of the behaviour change programme participants are asked to complete one Do per day for a period of 10 weeks. The request is that they complete at least one generic Do per Constancy and dimension of Behavioural Flexibility plus one 'green' Do in each these areas. Therefore, throughout the 10-week Do Something Greener programme, participants complete a minimum of 70 Dos out of the 245 that are available. This equates to two Dos in each area of FITness. Thirty-five of the Dos will be 'green' and will direct participants towards pro-environmental activity. Participants can complete more Dos if they wish; there is no limit to the

maximum number that they can try. This design gives the participant a choice about how many and which Dos they complete, to enable them to tailor their activities to suit their lifestyle and to direct development in areas that are weaker. As suggested in the literature review, a tailored approach might help participants to feel more committed to the intervention (see also Revell, 2014; Daamen et al, 2001).

If participants chose to complete more Dos, it is suggested that they select Dos in the areas where they have lower levels of FITness. For example, if a participant scores lower on the FIT Constancy of Awareness compared with Self-responsibility, it is suggested that they choose an additional Do for Awareness. This will help them to further direct development in this Cognitive Constancy and give greater balance across the different Constancies. As Fletcher and Stead suggest (2000), it is not only the strength of individual Constancies that is important but also the balance across these. Table 7.3 displays an example Do for each dimension of FITness. This shows half of the Dos that participants would complete as part of the 10-week Do Something Greener intervention (the full list of Dos are presented in Appendix F).

7.4.2.2 Do Something Different programme

The Do Something Different programme is based around a generic framework of Dos but without the 'green' Dos. The proposed programme contains 175 Dos in total, comprising 25 Dos to develop the Cognitive Constancies (five Dos per Constancy) and 150 Dos to develop dimensions of Behavioural Flexibility (five Dos per dimension of Behavioural Flexibility). Participants are instructed to complete the Dos in exactly the same way as the 'green' Dos – to complete one per day. Throughout the intervention participants will be asked to complete two Dos per Constancy and dimension of Behavioural Flexibility but both of these will be generic Dos rather than one 'green' Do and one generic Do. The only difference between the Do Something Greener and Do Something Different programmes is the absence of the 'green' Dos. All other aspects of the programmes are identical.

7.4.2.3 Pre- and post-intervention measures

Participants will complete a questionnaire pack pre- and post-intervention. This will consist of the cognitive environmental beliefs, and home, and work pro-environmental behaviour scales used extensively throughout this programme of research, and the FIT Integrity and Behavioural Flexibility scales of the FIT Profiler (Fletcher & Stead, 2000; see Appendix A). The former will

be used as a 'green' health check to enable tailoring and scaffolding of the Dos around priority areas, in order to facilitate the development of a personalised green action plan.

In addition to self-report measures, where possible, objective measures of pro-environmental activity will be used. These will include domestic/organisational meter readings for monitoring energy and water consumption, mileage reports for travel mode choice behaviour, and volume and contamination of general waste vs. recycled waste for waste disposal behaviours.

7.4.2.4 Daily diaries

Participants will be issued with diaries to complete throughout the intervention period. These will be used to record which Dos they complete. The Dos will be coded to make them easy to identify and record. In addition, participants will also reflect on their completion of each Do. They will be asked the following questions:

- Which Do did you try today? (provide Do code)
- Was the Do completed? (yes, fully completed; yes, partially completed; not completed)
- If the Do was not fully completed, please state what prevented you from completing the Do.
- How difficult was it to complete today's Do (5-point Likert scale: 1 = *very difficult* – 5 = *very easy*)?

Such a reflection process might help to raise participants' awareness of the changes that they are undertaking, and the progress and achievements that they are making. These, in turn, might help to develop levels of self-efficacy and fuel momentum for further changes.

7.4.2.5 Other materials

Pre-intervention, participants will also receive an information sheet about the study and a consent form. The information sheet will give details about the study and what participation will involve. The consent form will inform participants that they can withdraw their participation at any time, and without explanation. At the end of the study, participants will receive a debriefing sheet that restates the aims of the study and thanks the participant for taking part.

At the start of the intervention participants will receive an information booklet that feeds back their results from the pre-intervention psychometrics. This will display their current levels of FITness and pro-environmental activity (see Appendix G).

7.4.3 Proposed Procedure

The behaviour change intervention is designed in four phases and completed over 12-weeks (see Table 7.2 for an overview).

1. Phase 1 occurs 1-week before the start of the intervention and involves completion of the pre-intervention diagnostics (Week 1). Here, participants are informed about the nature of the research and are asked to complete the pro-environmental behaviour and cognitive environmental belief scales. These assess participants' baseline predispositions towards pro-environmental activity. At this Phase, participants also complete the FIT Profiler (Fletcher & Stead, 2000) to assess their baseline levels of FITness. Participants are also informed about the nature of the research and asked to provide informed consent for their participation.
2. At the start of Phase 2 (Weeks 2-11), participants receive an information booklet, which contains their feedback from the psychometrics that they completed in Phase 1. This outlines a participant's level of personal FITness across each of the Cognitive Constancies and the dimensions of Behavioural Flexibility, as well as their current levels of pro-environmental activity. The personal profile report indicates where participants should target their Do activities.

   In Phase 2 participants are also issued with a 'pack' of Dos (see previous description and Appendix F), instructions on how to complete these, and a diary for recording their activities. The instructions ask participants to complete one Do every day over the coming weeks. Participants in the Do Something Greener condition are asked to choose at least one generic Do and one 'green' Do in each area of FITness. Participants in the Do Something Different condition are asked to choose two generic Dos in each area of FITness. Participants are free to choose which Dos they attempt and the order in which they try these, but they are asked to avoid repeating the same Do. It is suggested also that they alternate between a Constancy Do and a Behavioural Flexibility Do from day-to-day, in order to keep a degree of variety across the activities, and develop equally their cognitive and behavioural

competencies. The Dos are designed to break daily habits and to expand natural ways of doing things in accordance with the FIT Framework (Fletcher & Stead, 2000).

3. In Phase 3 (start of Week 12), at the end of the 10-week intervention period, participants are asked to complete the FIT Profiler (Fletcher & Stead, 2000) and the cognitive environmental belief and behaviour scales a second time as per Phase 1. They are allowed to keep the Dos for future reference to continue developing their competencies post-intervention.
4. In Phase 4, 1-week post intervention (end of Week 12), participants receive a psychometric report outlining their levels of personal FITness and pro-environmental activity. This makes a comparison between their pre- and post-intervention levels both on the subjective and, where possible, objective measures collected throughout the intervention. Participants are thanked for participating in the behaviour change intervention and are encouraged to keep developing their behaviour.

7.4.4 Proposed Sample

The proposed behaviour change intervention is suitable for most individuals; there are very few restrictions on the sample that can be recruited. In the first study, which, it is suggested, should be a small-scale pilot test of the methodology, it is anticipated that participants will be recruited opportunistically. Later studies might consider recruiting participants according to their current levels of pro-environmental activity, so that the intervention might assist the majority of people who accept anthropogenic climate change (Spence et al, 2010), and who would like to do more to help the environment. As discussed elsewhere (see Page & Page, 2014a), it might prove ineffective to target a pro-environmental behaviour change intervention towards those individuals who, notwithstanding the scientific near-consensus, are either sceptical or outright hostile to any posited link between human activity and climate change.

To plan for future research, the minimum recommended sample size was calculated a priori using G*Power. With three study conditions (1. Do Something Greener; 2. Do Something Different; 3. control group), two measurements taken pre- and post-intervention, a predicted moderate effect size (r = .30), and a probability level of .05, the desirable sample size is 132 participants. This equates to approximately 40 participants per group. Future studies should seek to recruit this sample size to ensure that the study has a sufficient level of power to detect significant effects.

Table 7.2. Phases of the proposed behaviour change intervention

Phase	Week(s)	Do Something Greener	Do Something Different	Control
1	**1**	- All participants receive an information pack about the purpose of the study and are asked to give their consent to participate - All participants complete: 1. The FIT Profiler; 2. Cognitive environmental belief scale; 3. Home pro-environmental behaviour scale; 4. Work pro-environmental behaviour scale - All participants receive a feedback booklet on their levels of FITness and pro-environmental thinking and behaviour		
2	**2-11**	- Participants are issued with the Do Something Greener Do pack (n = 245 Dos) and instructions - Participants are issued with a daily diary for recording their activity.	- Participants are issued with the Do Something Different Do pack (n = 175) and instructions - Participants are issued with a daily diary for recording their activity	- Participants are issued with a daily diary for recording their daily activities
3	**Start of 12**	- The daily diaries are collected - All participants complete: 1. The FIT Profiler; 2. Cognitive environmental belief scale; 3. Home pro-environmental behaviour scale; 4. Work pro-environmental behaviour scale		
4	**End of 12**	- All participants receive a feedback booklet on their levels of FITness and pro-environmental thinking and behaviour - All participants are debriefed and thanked for their participation		
			- Participants receive the 'green' Dos	- Participants receive the Do Something Greener Do pack

7.4.5 Hypotheses

The empirical studies in this programme of research have examined the relationships between scores on FIT variables and pro-environmental activity. The findings of these studies have suggested that developing personal levels of FITness might have a positive impact on pro-environmental activity. The design of the proposed behaviour change intervention includes three conditions: a Do Something Greener condition; a generic Do Something Different condition; and a control condition. Based on the results of the preceding studies, I have the following expectations:

> H_{7a}: Participants in the Do Something Greener condition will exhibit (via self-reported and objective measures) the highest increment in pro-environmental activity from pre- to post-intervention in comparison with the Do Something Different and control conditions. This will include both self-reported environmental beliefs and home and work pro-environmental behaviour, as well as larger increments in recycling behaviours and larger decrements in energy and water use, and car miles.

H_{7b}: Participants in the Do Something Different condition will report a smaller but significant increment in pro-environmental activity (objective and self-reported) pre- to post-intervention in comparison with the Do Something Greener condition, but a larger increment compared with the control condition.

H_{7c}: There will be no change in the pre- to post-intervention pro-environmental activity (objective and self-reported) for participants in the control condition.

H_{7d}: Participants in the Do Something Greener and Do Something Different conditions will report larger increments in levels of personal FITness pre- to post-intervention, as measured by the FIT Profiler, compared with the control condition. It is not known which of the Do Something conditions will result in the largest increase.

H_{7e}: There will be no change in the pre- to post-intervention levels of personal FITness, as measured by the FIT Profiler, for participants in the control condition.

Table 7.3. Example Dos of the Do Something Greener programme (this represents 50% of the Dos available)

		Generic Dos	'Green' Dos
Cognitive Constancies	**Awareness**	Attend more closely to the routine tasks you perform at home or work today. Imagine you're explaining to someone else what you're doing, and why you're doing it this way. Write a letter to them describing one of your routines.	Take the time to count the number of lights and/or appliances that are turned on at your home/workplace. Do they need to be on? When do they go off? And who controls them? Discuss this with your family/colleagues.
	Balance	Plan a day or night out with someone you like spending time with. This might be a member of your family, a good friend or a work colleague. Do it one day this week.	Incorporate exercise and enjoyment into your daily travel one day this week. Try public transport, walking, cycling or car sharing. Keep a travel diary of how, when and where you did this. Was it easy?
	Conscience	Give people praise and credit where it is due today. Don't put people down or feel jealous if someone has achieved something.	Imagine that you could see carbon dioxide. Visualise the results and draw a picture of the effects. How would this affect your lifestyle or your company's activities? Think about what you could do differently.
	Fearlessness	Today, say 'no' to someone who takes advantage of you or who expects too much of you, even if the prospect is somewhat frightening.	Take on a specific green challenge today. For example, find out about switching your energy to a green supplier or change your bank to an ethical provider.
	Self-responsibility	Don't wait for someone else to make a start with something that needs to be done. Take the initiative and do it yourself today. This might be a DIY or gardening job you've been waiting for or a new project at work.	Acknowledge your past, personal contribution to climate change. Think about your current carbon footprint and do something to reduce it, regardless of what other people say or do. Change one thing today to reduce your carbon footprint. What impact did this have on your day-to-day activities?
Behavioural Flexibility	**Assertive**	Ask for a discount when purchasing something today.	Take a stand on a green issue at home or work. This might be about the heating and cooling controls, or the amount of equipment that is left on stand-by.
	Unassertive	Insist on giving your opinion on something today, just observe and let others have a say.	Take public transport or car share today and let everyone else get on board before you.
	Conventional	Be polite with everyone you meet today.	Make sure you adhere to your council's local waste disposal system this week. Recycle everything that you "should".
	Unconventional	Do something different with your usual dress – wear some distinctive jewellery or don't wear a tie depending on what would be unconventional in your circle.	Test-drive an electric bike and consider the advantages of using it to get around.
	Wary	Check the small print on an important document. For example, go through your bank statements and check any payments are correct, or check utility bill readings.	Organise a meeting with your local councillor or sustainability rep at work. Question them on their sustainability policy.
	Trusting	Lend a book or something else you value to a friend or work colleague.	Car share or take public transport to work today. Trust that it will work well.
	Predictable	Watch the same TV programme or listen to the same radio station at least twice this week.	Have short showers this week. Set a timer for 5 minutes (or less) and get out when the time is up, regardless of whether you want to stay for longer.
	Unpredictable	Buy a gift for someone who would not expect it.	Commute a different way today. Take a different route or a different mode of transport. Make your journey more sustainable.
	Energetic	Challenge yourself to see how quickly you can get through your tasks today.	Initiate the replacement of all relevant light and appliances with energy-saving versions, at home/work. Don't wait for someone else to do it!
	Calm	Don't hurry today: practice walking, talking and eating slowly.	One evening, turn off as many lights and appliances as possible. Enjoy the darkness and silence.
	Reactive	If something needs to be done, and it's not urgent or important to you, wait until someone asks you to do something about it.	Respond positively to an environmental initiative. This might be something at work, in your community or at home.

Table 7.3. cont.. Example Dos of the Do Something Greener programme (this represents 50% of the Dos available)

		Generic Dos	'Green' Dos
Behavioural Flexibility	**Proactive**	Organise a meeting to discuss something important to you or your family.	Make your own energy budget, set targets to reduce your energy use, and hit those targets.
	Team orientated	Volunteer to organise, or participate enthusiastically in, a team building exercise or event.	Raise money as a group for a carbon-saving initiative.
	Individual orientated	Make a decision without asking the group.	Reduce your personal waste, e.g., the amount you throw away, as much as possible over the course of a week.
	Risk taker	See failure as part of learning and have a go at something you might not be good at.	Get a weekly pass on public transport and use it for all your travel needs. Go somewhere different!
	Cautious	Get a second opinion on any piece of important advice or fact given today.	Take time to question an environmental claim about a product. This might be where your energy comes from or where your bank/building society invests their capital.
	Behave as you wish	If you have to dress a particular way for work, find some way of expressing your preferences. It could be by wearing a particular piece of jewellery or having a particular hairstyle.	Go outside in your lunch hour as often as possible over two weeks. Have a break in a natural setting, even if there is a lot of work to do.
	Behave as expected	Practice good manners whenever you can this week. For example, open the door for people, offer people tea or coffee, say 'Please' and 'Thank you' as often as possible.	Be meticulous, this week, about following all waste and energy reduction policies, e.g., recycle (at work and home), switch off lights, computers etc.
	Systematic	Rate your daily tasks according to whether they are urgent and/or important and tackle the important ones first.	Keep an energy diary at home/work by reading meters and setting targets.
	Spontaneous	Say 'yes' to something that you would normally hesitate over.	Go to a farmer's market or similar without a shopping list and buy what looks good.
	Open minded	Read about something that wouldn't normally interest you, politics, sport, a religion maybe.	Role play being "green" for a week. You don't have to believe, just do the best acting job you can.
	Single minded	Decide to do something you have been putting off because you think others might not approve. Don't be dissuaded or put off by others.	Plan a week's low carbon journeys and stick your plan (whatever the weather).
	Extroverted	Be curious about people this week, and show your interest by asking questions. Make the first move to introduce yourself to a group.	Start an environmental group at work or in your neighbourhood. Meet once this week.
	Introverted	Instead or discussing issues with others, take time to reflect. Fade into the background as much as possible this week.	Spend some time alone, collecting your thoughts (and some facts) about climate change.
	Definite	Stand up for yourself, and see the benefits of taking a firm line when challenged this week.	Find out about the scientific consensus on climate change and tell someone else about it.
	Flexible	Look at what others do differently in a similar role to you. Adopt something that they do that would work for you.	Change your energy supplier to a 'green' tariff (e.g. Good Energy). If it costs a bit more, then use a bit less.
	Gentle	Buy someone flowers, or send a card to say thank you for something someone has done for you.	Offer support to a person who is trying to implement a pro-environmental change.
	Firm	Don't feel you have to justify everything you do this week. Just state what you intend to do, and why, but don't over explain.	Adopt a new pro-environmental behaviour and persist until it is achieved.
	Not lively	Spend 5 minutes at the end of each day reflecting on the day's events and planning tomorrow's. Do this every day this week.	If you drive, plan your next three journeys without using the car.
	Lively	Walk briskly, as if you're excited to get somewhere. Stride along corridors and upstairs today.	Organise a social event to publicise environmental sustainability.

7.5 Discussion

7.5.1 The Do Something Greener Intervention

This Chapter introduced the Do Something Greener intervention as an alternative approach to pro-environmental behaviour change. The Do Something Greener behaviour change programme has been described in detail alongside a description of a pilot study designed to evaluate the programme's effectiveness. An empirical evaluation of Do Something Greener is planned for future research but is beyond the scope of this programme of research at the present time. With reference to previous research, this section discusses some of the potential strengths and weaknesses of Do Something Greener, as an alternative approach to pro-environmental behaviour change.

Even in the absence of empirical data, there is reason to believe that the Do Something Greener approach offers a feasible alternative way of supporting pro-environmental behaviour change. Unlike many of the preceding approaches described in the literature reviews (see Chapters 1 and 6), Do Something Greener targets behaviour change directly in incremental steps, by getting people to complete small daily behavioural experiments as volitional strategies for changing behaviour (Armitage, 2014). Participants perform new behaviours rather than being told what they need to do to change and left to get on with it, as is often the case with many of the other approaches that tend to over rely on the provision of information. This action-oriented approach, it is believed, will help to lessen the knowledge-action gap and intention-action gap that is often apparent in attempts toward pro-environmental behaviour change (see Blake, 1999). The daily Dos offer a structured programme for translating intentions into action (Bélanger-Gravel et al, 2013). They target directly behavioural habits. The inclusion of 'green' Dos in the Do Something Green intervention means that people actually perform pro-environmental behaviours as part of the programme, rather than just thinking about performing these, and through a structured programme of behavioural rehearsal, participants are able to establish 'greener' behaviours as new pro-environmental habits.

In relation to this, by challenging the routine of non-green habitual behaviour, the Dos might also help individuals to become more aware of their current behaviours and the environmental impact that these have, as well as the alternative courses of action that are available. By encouraging individuals to do something different, individuals are forced to pay more active attention to their behaviour. The Dos will not be as easy to implement as behaviours that have

been performed routinely in the past, nor will they have established the habit characteristics that can blinker cognitions.

The Dos are small daily actions that are achievable without over reliance on willpower. They can be gradually integrated into an individual's daily routine so that they become 'normal' and 'greener' ways of behaving. In this way change happens in small incremental steps that are achievable and measurable. This approach might encourage individuals to believe that they are capable of changing their behaviour – that is, it might increase their self-efficacy (Bandura, 1994) – because change is presented in a manageable and achievable way. After completion of a Do, and following the reflective process that is encouraged through completion of the daily diary, participants might feel more confident and empowered to undertake further change. This might also help them to keep momentum with their efforts to change and help to prevent the behavioural rebound that is often associated with established pro-environmental behaviour change approaches (see Abrahamse et al, 2005). In line with the recommendations emergent from the literature reviews, the change undertaken as part of the Do Something Greener programme is cumulative and progressive.

Another reason why the Do Something Greener programme might be an appropriate alternative approach towards pro-environmental behaviour change is because the Dos that individuals choose to complete are self-directed and tailored by the individual. This helps them to direct development in the lifestyle areas that are most in need of change. The 'green' audit taken pre-intervention contextualises the range of appropriate behaviours so that they are structured around a common framework, and not just random actions. Tailored behaviour change interventions have been found to be more effective than standard approaches (see Abrahamse et al, 2005).

The Do Something Greener programme offers a flexible approach to pro-environmental behaviour change. The programme can be delivered via a variety of different channels and in different contexts. It also has applicability to a variety of different participant groups, and in different locations. In the Do Something Greener pilot study described in this Chapter, participants would receive all of the Dos in an information booklet distributed at the start of the study. This is a traditional way of distributing behaviour change intervention programmes and concurs with the approach used previously to test the generic Do Something Different approach (see Fletcher et al, 2011). It is, however, also possible for the Dos to be distributed in

portable packs of cards (see Sharma, 2011), and/or via text messages and online (see Fletcher & Pine, 2013). Each of these approaches has proved effective. As empirical research on the effectiveness of the Do Something Greener approach is developed, future studies should also make a comparison of the most effective way of distributing the Dos to maximise participant engagement and outcome effectiveness. In relation to this, further developments of the Do Something Green intervention should also consider the total number of Dos available and whether all of these are accessible at any point throughout the intervention or whether a limited selection of Dos are available at different stages. For example, a certain number of Dos might be available at the start of the study with another set released after a certain number of weeks, etc. This phased-approach could be aligned with an individual's readiness to change (see Prochaska & Di Clemente, 1983).

7.5.2 The Study Design

The design of this preliminary study was not without limitations and could be developed further in future work. It was proposed that the data collection involved both self-reported and objective measures, where possible. Objective measures of both pro-environmental behaviour and FITness are desirable and would, of course, offer more reliable outcomes (Huffman et al, 2014). The former was factored into the design of the pilot study. Objective measures of pro-environmental activities are fairly easy to establish, in as much as they can be extrapolated from proxy measures such as energy use, waste produced, travel modality, and mileage. However, it is difficult to imagine a truly objective measure of FITness, in particular Behavioural Flexibility, that wouldn't place enormous practical demands in terms of observing a given individual behaving in a variety of different contexts over time. The practicalities of such observation would render it unlikely to collect sufficient data to infer correlations and to analyse patterns in behaviour. The dependency on self-reported measures of FITness brings to the fore the potential limitations with regards to the accuracy of self-report data and the recognized influence of self-serving bias (Schwarz, 1999). It is necessary, therefore, to interpret these scores, and any changes in them, with a degree of caution.

Following this line of reasoning, future studies that seek to evaluate the effectiveness of Do Something Greener should also make a comparison with other approaches of pro-environmental behaviour change, e.g., information provision, feedback, etc. These were not included in the design of the pilot study for two reasons; firstly, because it is important to

establish, in the first instance, the relevance of the Do Something Greener approach to pro-environmental behaviour change and secondly, owing to the large number of different comparisons that this would entail. Without such comparisons, however, it is not possible to judge directly the value of the Do Something Greener approach in comparison to other models. One step planned for the next phase of this programme of research will be to undertake further empirical explorations of the value of the Do Something Greener approach in comparison to other established approaches of pro-environmental behaviour change.

In sum, even without an empirical evaluation of the Do Something Greener approach, this Chapter has added a degree of eclecticism in the psychological approaches to pro-environmental behaviour change and suggested a new agenda for future research. It is hoped that the offering of Do Something Green will help to challenge the silos within which behavioural researchers work currently and will enable a broadening of the attentional set so that psychologists and behavioural researchers also consider alternative approaches towards pro-environmental behaviour change.

8 General Discussion and Conclusions

This general discussion will begin with an overview of the aims of the research, followed by a summary of the findings. It will then continue by drawing out some of the broader issues raised by the research, focusing on two pertinent questions:

1. What has this programme of research contributed to the understanding of pro-environmental behaviour?
2. What has this programme of research contributed to the understanding of pro-environmental behaviour change for the development of environmentally sustainable lifestyles?

8.1 Aims and Findings of the Research

8.1.1 A Summary of the Empirical Findings

The aim of this programme of research was to develop a better understanding of pro-environmental behaviours and pro-environmental behaviour change for the development of environmentally sustainable lifestyles. The research was conducted in the context of the FIT Framework (Fletcher & Stead, 2000). It sought to develop new and relevant understandings about the variables and processes that relate to environmentally sustainable choices and behaviours across contexts, and with consideration given to the role of habit and levels of personal FITness. A summary of the research follows.

Chapter 1 reviewed the literature on popular and historical models of behaviour and behaviour change, and considered broadly their application to pro-environmental activity and the development of environmentally sustainable lifestyles. The review identified that there are many existing psychological theories and models of behaviour and fewer models of behaviour change. Some of the approaches have been designed specifically to explain pro-environmental behaviours whereas others have been designed initially for behaviour of other types and applied latterly to the pro-environmental domain, with little adaption. Despite the range of different perspectives available, it is apparent that at the present time, no single model can offer an explanation of pro-environmental behaviour that is sufficiently convincing to direct efforts towards pro-environmental behaviour change. Overall, the models lack sufficient levels of utility to help practitioners develop useful interventions for behaviour change (see also Sniehotta et al, 2013).

In sum, those models that place greater emphasis on individual characteristics and personal capabilities often do not give sufficient consideration to the influence of social and contextual factors. In contrast, the models that focus on these extrinsic factors often have a tendency to downplay the role of intrinsic characteristics. Although, then, this suggests that the multidisciplinary approaches that include both intrinsic and extrinsic characteristics might be more suitable, these have tended to be too theoretically complex to define a clear and practical approach to behaviour change. There is a constant balancing act between levels of parsimony vs. complexity, and validity vs. utility, and this, it is believed, has led researchers to narrow their focus on further developing established theories, rather than shifting attention to more novel perspectives (see also Ogden, 2014). The review, therefore, identified the need to consider pro-environmental behaviours from different perspectives, and suggested that as well as sufficiently defining behaviour on a conceptual level (validity), it is also important to consider how the theoretical model might translate to a practical approach to encourage pro-environmental behaviour change (utility).

In response to the conclusions of Chapter 1, Chapter 2 introduced the cognitive, behavioural, and affective dimensions of FIT (Fletcher & Stead, 2000) and considered, in light of the criticisms outlined above, the value of the FIT Framework as an alternative approach for understanding pro-environmental behaviours that is explicitly accompanied by an associated framework for behaviour change. Chapter 3 then presented two empirical studies (Study 1 and Study 2) as the first explorations of the relationships between FITness and pro-environmental activity in home and work contexts. Study 1 identified the existence of the relationships, and Study 2 built on this and confirmed the results in a different sample. Based on the results of these studies, it was suggested that the development of personal FITness might be a useful alternative way of supporting individuals to become more pro-environmental in their approach.

In light of the results of Study 1 and Study 2, Chapter 4 considered the performance of pro-environmental behaviours across contexts, and explored the perceived influence of intrinsic and extrinsic variables on energy saving in home and work settings. Although Study 3 was designed as a pilot study to test the ranking task methodology, the higher than anticipated sample size gave it sufficient power to be included in the main programme of research. Following on, Study 4 explored further the perceived influence of a range of intrinsic and

extrinsic factors on energy saving in home and work settings, and elucidated the influence of FITness on pro-environmental activity in each of these contexts. The results suggested that pro-environmental behaviours that are performed at home are often not transferred to work, and this might be because extrinsic factors are perceived to have a larger influence on behaviour in this setting. Furthermore, the pro-environmental behaviours performed by individuals with lower levels of FITness perceived their behaviour to be more susceptible to the influence of extrinsic factors compared with individuals with higher levels of FITness. It was suggested that the behaviours of individuals with lower levels of FITness might be more strongly characterised by habit and therefore supported by cues in the context rather than guided by personal beliefs and intentions. Consequently, intended actions could be more susceptible to disruption and performed inconsistently and in accordance with the presence or absence of extrinsic factors.

Chapter 5 explored the extent to which different pro-environmental behaviours are characterised by habit, and how these change according to levels of personal FITness. The results suggested that people have clusters of pro-environmental behaviours that they perform but they tend not to perform all behaviours equally, and not all behaviours are characterised by habit. Individuals appear to act pro-environmentally within taxonomic behavioural categories (behaviours with similarities in time, place, skill, type, e.g., recycling, curtailment, travel mode; Thøgersen & Noblet, 2012), and this has little or no bearing on the propensity to behave in an environmentally friendly way in other areas. In sum, pro-environmental behaviour has a multidimensional structure.

Study 5 also found that habits can have both a positive and negative impact on pro-environmental activity. The pro-environmental behaviours that were stronger habits were characterised by automaticity and determined by context factors, whereas the behaviours that were weaker habits were more strongly determined by personal beliefs and desires. Overall, there appeared to be a complex interplay between automatic processes, controlled processes, and the ecological environment (Hall, 2014). Individuals with higher levels of personal FITness engaged more readily with pro-environmental behaviours that were less routine. In light of these findings, it was also suggested that development of levels of FITness might help individuals to extend their behavioural repertoire and engage intentionally with pro-environmental behaviours that are less characterised by habit.

In light of the results of the empirical studies and the on-going suggestion that development of levels of FITness might be a suitable way to encourage individuals to become more pro-environmental, Chapter 6 reviewed the existing popular techniques for pro-environmental behaviour change in order to develop a better understanding of their effectiveness. In sum, it suggested that both popular antecedent and consequent approaches such as goal setting, commitment making, information provision, and feedback, can be effective in the short-term but become less effective over time. The multidisciplinary community-based approaches (e.g., EcoTeams, see Hargreaves et al, 2011) appeared more effective but only attracted those individuals who were already pro-environmental in their approach.

Chapter 6 also highlighted how difficult it is to get people to reconsider and change their existing patterns of behaviour, particularly in the longer-term, and suggested that this might be because few new approaches towards behaviour change have been developed. One reason for this trend might be because researchers are becoming more focused and specialised in their work, in order to cope with the high volume of literature that is produced (Ogden, 2014), and this has led to a narrowing of their own attentional set. In light of the literature reviews and the results of the empirical studies (that support the FIT Framework as an alternative perspective), it is proposed that researchers themselves need to broaden their attentional set, including their theorising of (pro-environmental) behaviour and perspectives on behaviour change, and start to consider novel approaches that are more practically oriented though, so far, less well explored empirically.

Following these suggestions, Chapter 7 presented an alternative approach to encourage pro-environmental behaviour change based around the FIT Framework. This was called Do Something Greener. The proposed framework was developed with consideration to the discussions of the literature reviews and the results of the empirical studies. The newly developed Do Something Greener intervention included an application of the generic Do Something Different framework of FIT, as well as a degree of adaption to tailor the intervention towards pro-environmental activity. Although an empirical evaluation of Do Something Greener would have been ideal, it was not possible to reach this goal within the time available. Therefore, Chapter 7 described the design proposed for an empirical study and made some predictions about the results that would be expected. An empirical evaluation of Do Something Greener is planned as the next phase for future research.

8.1.2 How do the Empirical Findings Relate to Published Research?

8.1.2.1 FIT, morals and environmental self-identity

Although not discussed previously in this programme of research, after reviewing the pattern of results from the empirical studies, it has become apparent that existing research that explores the link between pro-environmental behaviour, mindfulness, morality and self-identity is particularly relevant to the findings of this research. Throughout Studies 1-4, the most noticeable relationships between FIT variables and pro-environmental behaviour were for the FIT Constancy of Conscience, or put differently, morality and ethics. Furthermore, the results of Study 3 and Study 4 show that individuals with higher levels of personal FITness think they behave in accordance with intrinsic factors as opposed extrinsic ones. Put together, these results suggest that individuals with higher levels of personal FITness, Conscience in particular, act in an environmentally friendly way because they are intrinsically motivated to do so. Their motivation to act pro-environmentally comes from within their person rather than being motivated by external rewards (Frey, 1997). These empirical findings concur with published research (van der Werff, Steg & Keizer, 2013a, b, c).

Considering the above discussed results in parallel with the findings of Study 5, might help to explain why people with higher levels of personal FITness feel intrinsically motivated to act pro-environmentally. The correlation analyses in Study 5 indicated positive relationships between the self-identity component of habit and level of FITness for more than one pro-environmental behaviour type, and typically for pro-environmental behaviours that were weaker habits. This suggests that individuals with higher levels of FITness see themselves as an environmentally-friendly person and are more likely to act pro-environmentally than those with lower levels of FITness, who have weaker environmental self-identities. Previously published research has shown that environmental self-identity is an important predictor of pro-environmental behaviour (Gatersleben et al, 2012; Whitmarsh & O'Neill, 2010; Van der Werff, Steg & Keizer et al, 2013a, b, c). In sum, one of the main findings of this programme of research suggests that individuals with higher levels of personal FITness have a stronger environmental self-identity and are likely to act pro-environmentally because they are intrinsically motivated to do so.

Following on, in relation to the Do Something Greener intervention as a method of pro-environmental behaviour change, this might not only help to embed directly pro-

environmental behaviours into personal lifestyles via the 'green' Dos, but also by directing development of personal levels of FITness at the generic level, help to strengthen an individual's environmental self-identity so that they act in an environmentally-friendly way without reliance on external incentives. As the literature reviews in Chapter 1 and Chapter 6 suggested, many established methods of pro-environmental behaviour change are developed from the perspective of bounded rationality and focus on external factors to incentivise change, often with short-term effects. They do not help to tackle the powerful network of habits in thinking, feeling, and affect which, as discussed extensively throughout this programme of research, can impede people's ability, or felt ability (self-efficacy) to change. By focusing on the development of personal levels of FITness in parallel with pro-environmental behaviour, the Do Something Greener intervention might help people to develop a stronger affiliation with pro-environmental activity and from this be intrinsically motivated to behave pro-environmentally, resulting in longer term effects and, perhaps, greater positive spillover in pro-environmental activity both across behaviours and contexts (see Truelove et al, 2014).

8.2 Contributions to Knowledge

8.2.1 What has this programme of research contributed to understanding pro-environmental behaviours and environmentally sustainable lifestyles?

8.2.1.1 The need to consider pro-environmental behaviours on a broader stage

This programme of research has explored the correlates of a range of pro-environmental behaviours in a sample pool of over 650 participants. In so doing it has, it is hoped, helped to develop a more comprehensive understanding of pro-environmental behaviours and how individuals can be encouraged to develop lifestyles that are overall more environmentally sustainable. The focus on lifestyles as well as individual pro-environmental behaviours was intentional and has been shown to be particularly important because, as several of the empirical studies presented in this programme of research have suggested, individuals are not consistent in their performance of pro-environmental behaviours. There is some spillover in pro-environmental behaviour but, perhaps, a larger degree of heterogeneity in the pro-environmental behaviours that people perform, and the circumstances in which they perform these. This programme of research has highlighted, and recommends, that it is important for researchers to consider pro-environmental behaviours on a broader stage. This includes taking a more diverse approach to studying pro-environmental behaviours by: 1) encouraging

researchers to broaden their attentional set and consider alternative approaches to behaviour change that are more novel and practically oriented; 2) measuring multiple pro-environmental behaviours or pro-environmental behaviour repertoires; and 3) measuring pro-environmental behaviours in different contexts.

8.2.1.1.1 Multiple pro-environmental behaviours in different contexts

This programme of research is, perhaps, one of the most comprehensive investigations to date of the effect of context on pro-environmental behaviours. The distinction in the performance of pro-environmental behaviours across contexts was highlighted first in Study 1 and Study 2, where the level of pro-environmental activity in a home context was identified to be significantly higher than performance of a similar range of activities in a work setting. This finding was repeated again in Study 4 in a different sample and with a more closely matched set of the pro-environmental behaviours (to lessen the bias attributable to the research design). Altogether, the results of these studies suggest that there is a small amount of positive spillover in pro-environmental behaviour from home to the workplace. When these empirical studies were designed and conducted, there was very little published research that explored the performance of pro-environmental behaviour in more than one context. Furthermore, as discussed previously in Chapter 4, most of the studies that have made a context comparison have compared pro-environmental behaviours performed in a domestic setting with those performed on vacation (see Dolnicar & Grün, 2009, for example). Very few studies have made the comparison between home and work settings, which, it is suggested, is more useful for understanding the development of environmentally sustainable lifestyles. It is believed that this programme of research has helped to advance research in this area and develop a more comprehensive understanding of the multidimensionality of pro-environmental behaviours and environmental sustainability in personal lifestyles.

Specifically, the results of the empirical studies imply that focusing on behaviour in one context might present a distorted and unrealistic perspective on the degree of environmental sustainability of personal lifestyles overall. This might be particularly apparent if patterns of behaviour are inferred from measurements taken in a domestic setting. By measuring a range of different pro-environmental behaviours across different taxonomic categories (Thøgersen & Noblet, 2012), even if by self-report, this programme of research has been able to identify the pro-environmental behaviours that are specific to different sites of practice, as well as those

that are transferred more readily across these. Most published research has tended to focus on one type of pro-environmental behaviour rather than a range of different behaviours (e.g., recycling, Tudor et al, 2007; energy use, Littleford et al, 2014).

Study 4 explored further the differences between contexts by measuring the perceived influence of a range of intrinsic and extrinsic variables on energy saving in domestic and organisational settings. This type of research has been called for recently (see Littleford et al, 2014), although the empirical studies in this programme of research were designed and implemented without knowledge of this request.

The findings of Study 4 suggest that pro-environmental behaviours performed in a domestic setting are perceived to be more strongly determined by cost and finances, the social influence of family and friends, and an individual's personal sense of social responsibility. In this regard, the popular approaches used to encourage pro-environmental behaviour change (see Chapter 6) such as the provision of information in the form of social norms (see Reese et al, 2014; Kormos et al, 2014; Nolan et al, 2009; for example) and feedback about behaviour and its financial costs (e.g., energy consumption, see Ueno et al, 2006) are confirmed as effective in a domestic setting. This is not entirely surprising considering that historically many of the interventions for pro-environmental behaviour change were designed with a domestic setting in mind. In contrast, however, the factors that were believed to influence energy saving in an organisational setting were noticeably different. These included environmental policies and procedures as well as a supportive organisational culture (e.g., good role models from leadership and management). Interestingly, the importance of feedback, rewards, and training to encourage energy saving was perceived as less influential at work compared with at home. This suggests that the provision of information is far less effective in this context.

These findings make several contributions. First, exploring pro-environmental behaviours across domestic and organisational settings has brought two distinct pools of literature closer together, and identified a bias in the focus of published research towards the former context. There is growing interest in understanding pro-environmental behaviours in non-domestic settings such as offices and other workplaces (e.g., see Zibarras & Coan, 2015; Greaves et al, 2013; Scherbaum et al, 2008; Lo et al, 2012; Murtagh et al, 2013), but overall in the published literature there is still a bias towards a domestic setting. This needs to be addressed in future

research both with consideration to the new models of behaviour that are developed, and in relation to the application and adaption of existing models to an organisational context.

Second, the findings of the empirical studies concur with Stern (2000) and suggest that the influencing factors most relevant to a particular behaviour are specific to each context. It is apparent that the differences between household and organisational contexts lead to differences in the performance of the behaviour, as well as distinct pro-environmental behaviour repertoires. They can also prevent spillover effects from one context to the other. This has two main implications for the design of pro-environmental behaviour change interventions. First, it suggests that encouraging people to take small steps to mitigate their environmental impact, in the hope that these small actions will have a catalyst effect on larger behaviours, might be ineffective (Thøgersen & Crompton, 2009). These results suggest that pro-environmental behaviours are relatively distinct and each might need a different mechanism to drive change (see Nye & Hargreaves, 2010; Bratt et al, 2015). Second, the same logic should also be applied when seeking development and change across different contexts. There is a need for different intervention techniques that are designed specifically for different types of pro-environmental behaviours and contexts. These need to consider the broader physical and social environment where the behaviours are performed.

8.2.1.1.2 Alternative perspectives on pro-environmental behaviour: The FIT Framework

More generally, the third contribution of this programme of research relates to the attentional set of researchers. The empirical studies have confirmed that it is important for researchers to widen their attentional set and consider pro-environmental behaviours (and behaviour change) on a broader stage, from perspectives with more practical application, even if these are, so far, less well explored empirically. In pursuit of this recommendation, this programme of research explored pro-environmental activity in the context of the FIT Framework (Fletcher & Stead, 2000), and adapted and applied the generic FIT Do Something Different intervention to support pro-environmental behaviour change.

The use of the FIT Framework in the context of pro-environmental activity was novel and largely exploratory. It was hoped that by using FIT, this programme of research would address some of the shortcomings of previous research, as well as present a different perspective on the personal characteristics that might relate to pro-environmental activity. Based on existing research conducted in relation to other behaviours, it was hypothesised that levels of personal

FITness would relate to pro-environmental activity such that individuals with higher levels of FITness would be more pro-environmental in their approach. Most of the empirical studies that were conducted in this programme of research, totalling an overall sample size of 654 respondents, included a version of the FIT Profiler psychometric (Fletcher & Stead, 2000) to measure levels of FITness alongside various measures of pro-environmental activity, habit, and extrinsic and intrinsic variables. In summary, the main findings were that:

1. Personal characteristics, as measured by FIT variables, correlate with an individual's cognitive and behavioural engagement with environmental sustainability such that individuals with higher levels of FITness are more pro-environmental in their approach. The relationship between FITness and pro-environmental behaviour is mediated by strength of environmental beliefs (see Study 1 and Study 2).
2. Higher levels of personal FITness help people to be more responsive to the context and organisational factors that encourage environmental sustainability (see Study 1 and Study 2).
3. FIT variables have a direct effect on the factors that are perceived to influence pro-environmental behaviour. Individuals with higher levels of FITness believe they act in accordance with their intrinsic beliefs whereas individuals with lower levels of FITness believe they act responsively in accordance with extrinsic factors such as cost and policies. Put differently, individuals with higher levels of FITness behave as they intend and feel they ought to whereas individuals with lower levels of FITness behave as they are told (see Study 4 and Study 5).
4. Higher levels of personal FITness helps individuals to perform pro-environmental behaviours that are less routine (see Study 5).
5. An intervention based on the FIT Framework might help to overcome some of the limitations of previous behaviour change techniques, and be an effective alternative approach to help individuals to develop lifestyles that are overall more environmentally sustainable (see Chapter 7).

All in all, this programme of research has shown that differences in levels of FITness account, in part, for the degree to which people engage with pro-environmental activity and what drives behaviour. Three key questions that arise from these findings are:

1. Why are people with higher levels of personal FITness more pro-environmental in their approach?
2. What does the FIT Framework add to our understanding of pro-environmental activity in comparison to other approaches?
3. How can the development of personal levels of FITness be used as an alternative way to encourage environmentally sustainable lifestyles?

These questions have implications for future research.

The strongest relationships between FITness and pro-environmental activity were for FIT Integrity and the Cognitive Constancies. Each of the Constancies had a positive relationship with an aspect of pro-environmental activity. This implies that an individual's general cognitive characteristics, the way they generally think, correlate with their perspective on environmental sustainability and, in turn, influence behaviour. Individuals with higher levels of FITness across the cognitive Constancies were more strongly engaged with pro-environmental thinking, and also performed more pro-environmental behaviours in home and work settings. These findings imply that individuals with these cognitive characteristics are able to effectively integrate pro-environmental activities into their lifestyles alongside many other competing priorities (higher levels of Balance). This might be because they are more actively aware of the need to do so (higher levels of Awareness), feel less constrained by emotions to act pro-environmentally even when this might run counter to social norms (higher levels of Fearlessness) or feel more self-responsible and morally obliged to do the right thing (higher levels of Self-responsibility and Conscience). It is certainly apparent that, in some ways, all of the cognitive Constancies are important for encouraging pro-environmental activity. Therefore intentionally directing their development might have a positive effect on the environmental sustainability of personal lifestyles.

Furthermore, taking the Constancy of Awareness as a specific example, it appears that a higher level of Awareness might help individuals to be attentive to information relating to anthropogenic climate change in general and, on a more personal level, their own behaviours and the environmental impact that these have, as well as the opportunities available for mitigating this impact. As discussed in Chapter 1, such an attentive and informed stance is an important foundation for the successful implementation of pro-environmental behaviour change. Many previous models of pro-environmental behaviour have identified awareness as

one of the key determinants of pro-environmental activity and made the assumption that individuals are actively aware. This programme of research has confirmed the importance of awareness in conjunction with the need to direct its development to encourage pro-environmental activity, as well as to support the successful implementation of pro-environmental behaviour change interventions. It has also offered a structured and practical programme to help challenge habits and direct the development of awareness to support the growth of environmentally sustainable lifestyles.

Behavioural Flexibility, although important, was not consistently related to pro-environmental activity. However, a sufficient level of Behavioural Flexibility might be important to ensure that people are behaviourally competent to respond appropriately to the challenges posed by anthropogenic climate change currently, and as predicted in the future. Indeed, individuals with higher levels of Behavioural Flexibility might have a higher propensity to develop and embed pro-environmental behaviours in their behavioural repertoires, as required. Furthermore, directing the development of Behavioural Flexibility alongside FIT Integrity might help to develop an individual's personal belief that they are even capable of changing their behaviour – their self-efficacy. This is an important consideration, since the extent to which people believe that their specific efforts will be successful helps to determine their behavioural motivation for current and future actions.

This programme of research has suggested that, in comparison with other models of pro-environmental behaviour, the FIT Framework offers a range of personal characteristics that are trainable and have the potential to be developed to encourage environmentally sustainable lifestyles. The findings of the empirical studies, which based on a sample pool of over 650 respondents, make it possible to present the FIT Framework more confidently as an alternative model of pro-environmental behaviour. Of course this programme of research has been exploratory and the empirical studies not without their weaknesses; their reliance on self-report data is just one area for development. However, this exploration of pro-environmental activity in the context of the FIT Framework, although not empirically perfect, has helped to shine a light on some of the existing weaknesses of established and popular models of behaviour, namely, their trade-offs between parsimony and complexity, and validity and utility, which have often resulted in the lack of an explicitly associated model of pro-environmental behaviour change.

8.2.2 What has this programme of research contributed to the understanding of pro-environmental behaviour change for the development of environmentally sustainable lifestyles?

8.2.2.1 The resistance of habit

In light of the above discussion, a pertinent aim of this thesis was to initiate the development of an intervention to encourage pro-environmental activity; to help people to change their behaviours and to lead lifestyles that are more environmentally sustainable. In relation to this, a second goal was to enable change that was achievable in a way that did not over rely on resources of willpower. The results of the empirical studies have made it possible to propose an intervention based on the FIT Framework and, although it has not been possible to evaluate empirically the effectiveness of Do Something Greener, as it is named, the design of the study has been described and it is planned as the next phase for future research.

It is believed that the change approach offered by Do Something Greener might have many advantages compared with other established methods. This might be because it offers a more direct approach to support the translation of intentions into action, through the use of volitional strategies designed within small behavioural experiments (Armitage, 2014; Gollwitzer, 1993). Previous pro-environmental behaviour change interventions have focused largely on various sources and modes of information provision (e.g., feedback, social messaging; see Chapter 6 for a review). They have been developed from the perspective of bounded rationality choice models (see Chapter 1), and assumed that the acquisition of new information about behaviour and/or its alternatives will lessen the value-action or thinking-action gap (Blake, 1999) and lead to behaviour change. As the literature review presented in Chapter 6 suggested, this approach is, in the main, ineffective, particularly for effecting long-term change. Often, the changes that are implemented immediately following the provision of information are not maintained in the longer-term and following withdrawal of the intervention. One reason might be because the existing network of habits in thinking, affect, and behaviour is often too powerful to overcome by increased knowledge and thinking alone.

Habit theory (Verplanken et al, 1997; Verplanken et al, 1994, as discussed in Chapter 5) argues that once behaviours have become characterised by habit, they become "scripted" (Fujii & Garling, 2003) and are performed automatically in response to environmental cues, rather than deliberate decision processes. This makes them a functional way of behaving in everyday life.

However, when behaviour is performed automatically, individuals restrict the range of information that they consider; they are less aware of their actions, the environmental impact that these have, and the alternative behaviours that are available (see Danner et al, 2007, 2008). They develop "tunnel vision" (Walker et al, 2014) and are thereby less responsive to interventions based on information provision. Furthermore, this might lead individuals to believe that they have no choice or ability to change their behaviour (see Page & Page, 2014a). Such negative automatic thinking, or more specifically, negative environmental thinking, can significantly impair personal beliefs in one's ability to change; it can affect personal levels of self-efficacy (Bandura, 1994). Moreover, it only takes one negative environmental thought to block action entirely, even if the thought itself is demonstrably incorrect (see Page & Page, 2011).

In line with the habit discontinuity hypothesis (Verplanken et al, 1997), it has been suggested and confirmed, that a change or discontinuity in circumstance/context, often in the form of a life course transition (e.g., moving house, starting a new job etc.), is sufficient to bring about behaviour change (e.g., Walker et al, 2014, see also Chapter 5). On a practical level, life course transitions are natural changes in circumstances that are only likely to occur several times throughout an individual's life at most, and probably during a fixed chronological time period when such transitions naturally occur (e.g., retirement, moving house, etc.). As such, they do not offer a feasible approach to implementing change more frequently, on a regular basis as required for pro-environmental behaviour change. The proposed Do Something Greener intervention was designed to overcome some of these limitations, primarily by tackling the habit web directly through structured daily behavioural experiments that encompass habit reversal and new habit rehearsal.

8.2.2.2 Do Something Greener

The Do Something Greener intervention was adapted from the generic Do Something Different approach (see Fletcher, Pine & Penman, 2005) of the FIT Framework based on the results of the empirical studies and literature reviews. It was designed to address directly the problem of habit by getting people to complete a structured programme of daily Dos. The Dos were designed to expand an individual's repertoire of behaviours directly in order to weaken the existing network of habits and routines within which, it is proposed, pro-environmental behaviours reside. The Dos also direct cognitive development across the Cognitive Constancies.

The driving credo is that habits are not independent from one another, but exist in a mutually supporting network of habit webs and routines (cf. Neal et al, 2006). By breaking down the distal habits that form the habit-web in which the proximal target habits such as pro-environmental behaviour reside, the Do Something Greener programme should enhance an individual's generic flexibility and put people in a (psychological) place in which they can change anything about themselves.

Enhanced flexibility in both thinking and behaviour, as demonstrated throughout this programme of research, has several benefits for pro-environmental activity. This includes greater alignment between behaviours and intrinsic beliefs, being more responsive to extrinsic factors that encourage environmental sustainability, and having more extensive behavioural repertoires that include pro-environmental behaviours. All in all, these findings support Do Something Greener as a suitable alternative approach to encourage the performance of pro-environmental behaviours and, moreover, the development of environmentally sustainable lifestyles. Unlike many preceding approaches to change, Do Something Greener seeks to change both cognitions and behaviours simultaneously, in order to address both the psychological and behavioural challenges of pro-environmental activity.

Verplanken and Wood (2006) suggest that the goal of most, if not all, interventions is to bring about behaviour change. This inherently means replacing old habits with more effective behaviours (Verplanken & Wood, 2006). The habit reversal and new habit rehearsal approach of the Do Something Greener intervention enables people to not only challenge existing thinking and behaviours, but also replace these with alternative actions, some of which are intentionally pro-environmental. On this basis, it is expected that developing levels of FITness through the Do Something Greener intervention will help people be cognitively, psychologically, and behaviourally ready to make the transition towards an environmentally sustainable lifestyle.

8.3 Limitations and Directions for Future Research

It is obvious that this programme of research is not without its limitations. As noted earlier, the data were self-reported and included only individuals' perceptions of their environmental activities and levels of FITness, rather than objective measures. This introduces a degree of measurement error and raises potential limitations with regards to the accuracy of self-report

data and the influence of self-serving bias (Schwarz, 1999), particularly in relation to the performance of environmentally sustainable actions. Objective measures of both pro-environmental activity and FIT variables are much more desirable and would, of course offer a more reliable outcome (Huffman et al, 2014). However, as this programme of research was intended to demonstrate the possible relevance of a new theory of pro-environmental behaviour, and an associated practical model of pro-environmental behaviour change, then it is believed that self-reported data is sufficient in this instance, particularly with consideration to the overall sample size of more than 650 participants, and the replication of results across different empirical studies. Many other studies in the area have employed similar methods (see Abrahamse et al, 2005, Osbaldiston & Schott, 2012).

The relationships that have been evinced between FIT variables and pro-environmental activity are correlational rather than causal and, moreover, exhibit statistical relationships of only modest strength. They are also dependent on the reliability of the measures used, which as the psychometric analyses of the FIT Profiler scales suggest, is not always sufficient, particularly for Behavioural Flexibility. The Behavioural Flexibility scale of the FIT Profiler is designed to measure the range of behaviours that people perform and therefore when completing this scale, respondents must provide two responses (rather than one) per scale item. This is, perhaps, an unusual or unfamiliar request for most participants, and it is different to the way respondents are asked to complete the other items in the FIT Profiler. Therefore, respondents might not fully understand how to complete the scale, i.e., by providing a range of responses, and continue their completion by indicating a single point, as per the other scales. Indeed, the low Behavioural Flexibility scores reported throughout this programme of research, which are calculated by summing the response range for each item, suggest that respondents might not have fully understood how to complete this scale. Consequently, the Behavioural Flexibility scores reported in these studies are low and do not reflect true levels of Behavioural Flexibility. Of course, the latter of these problems is always possible when using self-report measures. However, the design of the Behavioural Flexibility scale of the FIT Profiler might augment it further.

The design of the FIT Profiler scales is historic and a full psychometric analysis of the scales, with the intent to refine and develop them, has not yet been undertaken. In light of the findings of these empirical studies, and with consideration to the above discussion, it seems, perhaps,

the opportune time to focus on their development. One way that the Behavioural Flexibility scale could, as per the discussion above, be improved, would be to split the bi-polar dimensions of the existing Behavioural Flexibility items into separate items and ask participants to rate how frequently they behave in this way. The items could then be paired by the researcher at the stage of data analysis.

Another limitation relevant to the design of the research, relating specifically to Studies 3, 4 and 5, is the use of ranking scales. Respondents completed the rank scales to indicate how they perceived intrinsic and extrinsic factors to influence their pro-environmental behaviour. It appeared that they were able to do this successfully although in hindsight, the request for them to rank up to 15 different items for each pro-environmental behaviour might have been particularly challenging. Indeed, the pattern of responding observed in Study 3 suggests that often respondents ranked the items in the order that they were presented in, rather than according to the instruction. Furthermore, as ranked data does not adhere to the distributional assumptions of parametric tests, when inferential analyses are conducted it is not possible to calculate the magnitude of the difference between scores. Consequently, the analysis is less powerful than its parametric counterpart (e.g., a t-test). In follow-on studies designed to explore the influence of different factors on pro-environmental behaviour, I will use a Likert scale design where respondents rate how strongly each factor influences the specified behaviour and, perhaps, in correspondence with this, ask participants to identify the three most influential factors.

This programme of research did not measure the relationships between alternative behavioural frameworks and theories of pro-environmental action, principally owing to the large number of disparate measures that these alternative frameworks entail. It is not possible to judge directly, therefore, the value of the FIT Framework in comparison to other models. Nonetheless, based on the results of these empirical studies, it is evident that there is potential to explore further relationships between the FIT Framework and pro-environmental activity in a more systematically comprehensive and validated way, and to evaluate empirically the value of the Do Something Greener intervention in relation to pro-environmental behaviour change. In relation to this, and with consideration to the above criticisms relating to the FIT Profiler measure, there is also a future research opportunity to conduct a comprehensive psychometric

analysis on the FIT Profiler with the intent to improve the measure's validity and reliability (see previous discussion).

The next phase of research, therefore, will be to conduct further empirical explorations of the relationships between FIT variables and pro-environmental activity in different samples and sites of practice, and to compare these with the relationships between pro-environmental action and other psychological variables derived from alternative theories of behaviour. The immediate next step, however, is to offer the Do Something Greener programme to individuals, and conduct an empirical evaluation of its effectiveness. This, it is hoped, will make a small practical difference in the world.

8.4 Final Thoughts

The aim of this programme of research was to advance knowledge of pro-environmental behaviours and pro-environmental behaviour change within the context of the FIT Framework, in order to support the development of environmentally sustainable lifestyles. The research sought to develop new and relevant understandings about the variables and processes that lead to environmentally sustainable choices and behaviours across contexts, and with consideration to the role of habit and levels of personal FITness. Overall, the results of the empirical studies show that an individual's cognitive characteristics and behavioural flexibility, as measured by levels of personal FITness, do influence engagement with pro-environmental activity and the extent to which personal lifestyles are environmentally sustainable. Additionally, therefore, it is suggested that developing levels of personal FITness, which, it is proposed is possible by following the Do Something Greener intervention, might help individuals to be cognitively, psychologically, and behaviourally ready to make the transition towards a more environmentally sustainable lifestyle.

By exploring pro-environmental behaviour within the context of the FIT Framework, it is hoped that this programme of research has challenged some of the habitual tendencies that researchers themselves are starting to develop in relation to the study of pro-environmental behaviour, and added a degree of eclecticism in the psychological approaches to pro-environmental behaviour change. It is hoped that this will help to set a more practically oriented agenda for future research.

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Appendices

Appendix A: Questionnaire for Study 1 and Study 2

This questionnaire is called The FIT GAP. It is a comprehensive questionnaire that measures environmental beliefs and behaviours. There are 7 different sections to the questionnaire. Sections A, B & C measure your environmental beliefs and behaviours both at home and at work. Section D measures your willingness to change your behaviour in order to protect the environment. In Section E you will be asked about your general thinking and behavioural styles. Your concern for the environment will be measured in Section F and finally, in Section G you will provide demographic information about yourself.

The questionnaire should take you no more than 30 minutes to complete.

Please answer each question. The data you provide will remain confidential and anonymous. You will not be judged on the responses you give so **please be honest**.

If you have any questions about the questionnaire please contact the researcher.

Section A: Environmental Beliefs

Below is a list of different activities and behaviours. Please consider each one and rate how important it is for *protecting the environment*. Please rate each activity in two ways:

1. how important you THINK it is at the MOMENT – that is your **current beliefs**
2. how important you THOUGHT it was 2 YEARS AGO – that is your **past beliefs**

Please use the scale below for your ratings.

1	2	3	4	5	6	7
Extremely unimportant	Very unimportant	Unimportant	Neither	Important	Very important	Extremely important

	Current beliefs	**Past beliefs**
	Importance at the **moment**	Importance **2 years ago**
1. Recycling materials		
2. Turning unused appliances off at the plug overnight		
3. Reusing materials		
4. Reducing landfill		
5. Turning appliances off when they are finished with		
6. Buying ecologically sound household cleaning products		
7. Protecting the environment from chemicals		
8. Caring for natural surroundings/environment		
9. Supporting environmental organisations		
10. Saving natural energy sources e.g. gas, oil		
11. Buying organic food		
12. Donating unwanted items to charity shops or recycling schemes		
13. Recycling plastic		
14. Signing letters of petitions for environmental action		
15. Recycling cardboard		
16. Participating in mass meetings or protests		
17. Composting household waste		
18. Reusing old or refusing new plastic bags when shopping		
19. Recycling paper		

Appendix A: Questionnaire for Study 1 and Study 2 cont.

Section A: Environmental Beliefs cont.

	Current beliefs	**Past beliefs**
	Importance at the **moment** Rate 1-7	Importance **2 years ago** Rate 1-7
20. Not littering i.e. putting rubbish in the bin		
21. Flying less		
22. Walking, cycling or taking the bus rather than using the car		
23. Buying household appliances with high energy efficiency ratings		
24. Buying environmentally approved cosmetic products		
25. Reducing CO2 emissions		
26. Using low energy consumption light bulbs		
27. Showering rather than taking a bath		
28. Having a full load before putting the washing machine on		
29. Turning lights off if you are the last person to leave a room		
30. Limiting water usage		
31. Reducing waste		
32. Turning the tap off when brushing your teeth		
33. Buying local produce		
34. Using scrap paper/envelopes for memos/notes		
35. Donating money to environmental organisations		
36. Recycling glass		
37. Buying recycled products e.g. paper		

Appendix A: Questionnaire for Study 1 and Study 2 cont.

Section B: Environmental Behaviours at Home

Now consider the following activities and behaviours again.

For each one *think about whether or not you do it and how much you do it when you are at <u>home or outside of work</u>*. Please rate each one in the following ways:

1. how often you do it at home at the MOMENT – **current behaviour**
2. how often you did it at home 2 YEARS AGO – **past behaviour**

Please use the scale below for rating how often you perform each activity and behaviour.

0	1	2	3	4	5
Never	Rarely	Sometimes	About half the time	Often	Always

	Current behaviour	**Past behaviour**
	How often do you do this at the **moment**? Rate 0-5	How often did you do this **2-years ago**? Rate 0-5
1. Buy environmentally approved cosmetic products		
2. Recycle plastic if facilities are/were available		
3. Buy local produce		
4. Recycle cardboard if facilities are/were available		
5. Throw rubbish on the floor		
6. Compost household waste		
7. Reuse old or refuse new plastic bags when shopping		
8. Use scrap paper/envelopes for memos/notes		
9. Donate unwanted items to charity shops or recycling schemes		
10. Buy recycled products when available e.g. paper		
11. Fly for leisure purposes		
12. Walk, cycle or take the bus rather than using the car		
13. Buy organic food		
14. Buy household appliances with high energy efficiency ratings		
15. Recycle paper if facilities are/were available		
16. Turn the tap off when brushing your teeth		
17. Use low energy consumption light bulbs		
18. Shower rather than take a bath		
19. Turn appliances off when they are finished with		
20. Sign letters or petitions for environmental action		
21. Buy ecologically sound household cleaning products		
22. Turn lights off if you are the last person to leave a room		
23. Have a full load before putting the washing machine on		
24. Recycle glass if facilities are/were available		
25. Donate money to environmental organisations		
26. Turn unused appliances off at the plug overnight		
27. Participate in mass meetings or protests		

Appendix A: Questionnaire for Study 1 and Study 2 cont.

Section C: Environmental Behaviours at Work

Now consider the activities and behaviours below, some of these are different from previous sections so please read each one carefully.

For each one *think about whether or not you do it and how much you do it when you are <u>at work</u>*. Please rate each one in the following ways:

1. how often you do it at work at the MOMENT – **current behaviour**
2. how often you did it at work 2 YEARS AGO – **past behaviour**

Please use the scale below for rating how often you perform each activity and behaviour.

0	1	2	3	4	5
Never	Rarely	Sometimes	About half the time	Often	Always

	Current behaviour	**Past behaviour**
	How often do you do it at the **moment**? Rate 0-5	How often did you do this **2-years ago**? Rate 0-5
1. Recycle paper if facilities are/were available		
2. Use scrap paper for rough work		
3. Turn lights off if you are the last person to leave a room/office		
4. Recycle ink cartridges or make these available for recycling		
5. Throw rubbish on the floor		
6. Fly for business purposes		
7. Print documents rather than reading on-screen		
8. Use recycled paper/envelopes if available		
9. Turn taps off after use		
10. Recycle cardboard if facilities are/were available		
11. Reuse envelopes		
12. Turn the printer off overnight (if not needed)		
13. Make old equipment available for recycling or recycle it yourself		
14. Recycle printer toners or make these available for recycling		
15. Car share for work-related journeys		
16. Recycle glass if facilities are/were available		
17. Print documents double-sided or 2 sheets per page		
18. Use a coffee cup rather than plastic cups		
19. Open window blinds to let light into the room/office		
20. Reuse old folders for new projects		
21. Recycle plastic e.g. plastic cups, if facilities are/were available		
22. Share work equipment with colleagues		
23. Buy organic food if available		
24. Turn your computer off when you have finished using it (including monitor)		

Appendix A: Questionnaire for Study 1 and Study 2 cont.

Section D: Willingness to Change

Please consider the following activities and behaviours. For each one, rate how willingly you would do it, if possible, in order to *protect the environment*.

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
I am willing to…					
1. recycle *as much as I can*					
2. reduce my household waste *as much as possible*					
3. reuse materials *as much as possible*					
4. buy more recycled products *if possible*					
5. limit my water usage *as much as possible*					
6. reduce my CO^2 emissions *as much as possible*					
7. protect the environment from chemicals *as much as I can*					
8. care *as much as I can* for natural surroundings/environment					
9. support environmental organisations *as much as possible*					
10. reduce my landfill *as much as possible*					
11. buy *more* ecologically sound household cleaning products					
12. recycle *all* used printer cartridges & toners					
13. save natural energy sources *as much as possible*					
14. compost *more* household waste					
15. reuse old or refuse new plastic bags *every time* I shop					
16. *always* use scrap paper for memos/notes					
17. donate *all* unwanted items to charity or recycling schemes					
18. *always* turn lights off if I am the last person to leave a room					
19. walk, cycle or take the bus for *all* short journeys rather than using the car					
20. *always* turn unused appliances off at the plug overnight					
21. have *fewer* baths and shower instead					
22. *always* turn the tap off when I am brushing my teeth					
23. buy *more* organic food if available					
24. *always* have a full load before putting the washing machine on					
25. buy *more* appliances with high energy efficiency ratings					
26. fly *less* when possible					
27. *always* turn appliances off when I have finished using them					
28. *only* use low energy consumption lights bulbs if possible					
29. buy *more* produce from local shops rather than the supermarket					
30. *always* turn taps off after use					
31. buy *more* environmentally approved cosmetic products					
32. sign *more* petitions for environmental action					
33. *always* put rubbish in the bin					
34. donate *as much money as I can afford* to environmental organisations					
35. recycle *all* paper, plastic, glass and cardboard					
36. participate *more* in environmental protests/meetings					

Appendix A: Questionnaire for Study 1 and Study 2 cont.

Section E: The FIT Profiler (those questions * were included in the short-version of The FIT Profiler in Study 1)

In this section you will be asked about how you think and behave.

The Questions - please read these instructions carefully – take your time. Your results will be meaningless unless you answer questions thoughtfully, and as guided below.

There are 2 types of question in this section of the questionnaire. Some questions require a SINGLE TICK answer only. Other questions require EITHER a SINGLE TICK *when you are definite about your answer* OR you can TICK A RANGE *if you think that your actions, thoughts or behaviour varies*. It will be obvious which question is which type.

Answer according to your actual thoughts and behaviour, not as you would want them to be. Answer according to comfortable thoughts and behaviour, not as others would want you to think and behave.

Please consider each of the 5 examples below to see what we mean. Make sure you understand before going on to the questions. Remember, your results will be affected by the accuracy of your responses.

Example 1: One direction, single tick box. You automatically act/think/behave this way. Tick any single box to indicate strength or response.

Do you show your feelings FREELY or KEEP THEM TO YOURSELF?	5	4	3	2	1	0	1	2	3	4	5
	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Show them freely				Neither one nor the other			Keep them to yourself			

Example 2: One direction, narrow range. You mostly act/think/behave this way. Tick any 2 or 3 boxes to indicate strength of response.

Do you show your feelings FREELY or KEEP THEM TO YOURSELF?	5	4	3	2	1	0	1	2	3	4	5
	☐	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
	Show them freely				Neither one nor the other			Keep them to yourself			

Example 3: One direction, wide range. You tend to act/think/behave this way. Tick any 4 or all 5 boxed to indicate strength or response.

Do you show your feelings FREELY or KEEP THEM TO YOURSELF?	5	4	3	2	1	0	1	2	3	4	5
	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐
	Show them freely				Neither one nor the other			Keep them to yourself			

Example 4: Mid point, single tick box or narrow range. You have no strong tendency to act/think/behave in either way. Tick either 0 or 0 plus 1 or 2 boxes each side (not necessarily the same numbers each side) to indicate strength of response.

Do you show your feelings FREELY or KEEP THEM TO YOURSELF?	5	4	3	2	1	0	1	2	3	4	5
	☐	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
	Show them freely				Neither one nor the other			Keep them to yourself			

Example 5: Both directions, wide range. You sometimes act/think/behave in one way and sometimes in the other way. Tick any 3, 4 or 5 boxes on each side (not necessarily the same numbers each side) to indicate strength of response.

Do you show your feelings FREELY or KEEP THEM TO YOURSELF?	5	4	3	2	1	0	1	2	3	4	5
	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
	Show them freely				Neither one nor the other			Keep them to yourself			

Please read the instructions again if you are not clear. When you are certain about how to answer, start completing the questions below.

Appendix A: Questionnaire for Study 1 and Study 2 cont.

The FIT Profiler Questions

1 BF*
Do you behave in an ASSERTIVE or UNASSERTIVE manner?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Assertive — Neither one nor the other — Unassertive

2 F
Does the THOUGHT OF FAILURE fill you with fear?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

[SINGLE TICK ONLY]

3 SR
Do you feel that you HAVE A CHOICE IN LIFE or NO CHOICE AT ALL?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Always a choice — Neither one nor the other — Never a choice

[SINGLE TICK ONLY]

4 B
When WORK IS OVER can you RELAX?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

[SINGLE TICK ONLY]

5 BF*
Do you behave in a CONVENTIONAL or UNCONVENTIONAL manner?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Conventional — Neither one nor the other — Unconventional

6 C
Do you think that MORAL and ETHICAL STANDARDS have to be COMPROMISED to achieve success?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

[SINGLE TICK ONLY]

7 A
Are you AWARE of what you are doing?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

[SINGLE TICK ONLY]

8 F
Do you generally feel APPREHENSIVE or CONFIDENT?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Apprehensive — Neither one nor the other — Confident

[SINGLE TICK ONLY]

9 B
Do you believe it is important to DEVELOP a BALANCE between WORK and HOME?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

[SINGLE TICK ONLY]

10 BF*
Are you CAUTIOUS or TRUSTING of others?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Cautious — Neither one nor the other — Trusting

11 SR
Do you feel that you have CONTROL over WHAT HAPPENS to you?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

[SINGLE TICK ONLY]

Appendix A: Questionnaire for Study 1 and Study 2 cont.

The FIT Profiler Questions cont.

12 B
Do you find yourself WORRYING about PERSONAL MATTERS whilst at WORK?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

13 C
Do you believe that people are essentially TRUSTWORTHY?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

14 BF
Would you consider yourself to be a PREDICTABLE person?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
No, very unpredictable — Neither one nor the other — Yes, very predictable

15 A
Do you find yourself DAY DREAMING?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

16 F
Do you feel APPREHENSIVE when you are the CENTRE OF ATTENTION?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

17 SR
To what extent do you believe LUCK contributes to your SUCCESS?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
A large extent — Neither one nor the other — Not at all

18 BF*
Are you a ENERGETIC/DRIVEN or CALM/RELAXED person?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Energetic/ driven — Neither one nor the other — Calm/ relaxed

19 B
When you are AT WORK do you wish you weren't?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

20 C
Do you find it EASY to keep a SECRET/CONFIDENCE?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

21 A
Do you MONITOR/ANALYSE things you have done?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

Appendix A: Questionnaire for Study 1 and Study 2 cont.

The FIT Profiler Questions cont.

22 BF* Are you a REACTIVE or PROACTIVE person?	5 ☐ Very reactive	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ Very proactive
23 F Do you meet DIFFICULT SITUATIONS head on or try to avoid them? [SINGLE TICK ONLY]	5 ☐ Head on	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ Avoid
24 SR Do you believe you can CHANGE the way you ARE? [SINGLE TICK ONLY]	5 ☐ Yes, greatly	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ No, not at all
25 B How important do you believe it is to BE ALONE? [SINGLE TICK ONLY]	5 ☐ Very important	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ Not at all important
26 BF* Are you GROUP or INDIVIDUALLY orientated?	5 ☐ Group orientated	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ Individually orientated
27 C Do you think that MORAL and ETHICAL standards should be UPHELD? [SINGLE TICK ONLY]	5 ☐ Yes, always	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ No, never
28 A Do you MONITOR/ANALYSE the ACTIONS and WORDS of others? [SINGLE TICK ONLY]	5 ☐ Yes, always	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ No, never
29 F Does putting forward an UNPOPULAR VIEW WORRY YOU? [SINGLE TICK ONLY]	5 ☐ Yes, always	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ No, never
30 BF* Are you a RISK TAKER or a CAUTIOUS person?	5 ☐ Risk taker	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ Cautious
31 SR* Do you FEEL IN CONTROL? [SINGLE TICK ONLY]	5 ☐ Yes, always	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ No, never

Appendix A: Questionnaire for Study 1 and Study 2 cont.

The FIT Profiler Questions cont.

32 B
Does your PERSONAL LIFE adversely affect your WORK LIFE?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

33 C*
Do you believe that you have to TELL LIES to SUCCEED?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

34 BF*
Do you behave AS YOU WISH or AS OTHERS EXPECT?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Behave as I wish — Neither one nor the other — Behave as expected

35 A*
Are you always CLEAR as to why you did something or are you often SURPRISED WITH YOURSELF?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Always clear — Neither one nor the other — Often surprised

36 F
Does the FEAR OF REJECTION stop you from doing things you want to do?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

37 SR
To what extent do you TAKE CHARGE OF YOUR LIFE?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
A large extent — Neither one nor the other — Not at all

38 BF*
Are you a SYSTEMATIC or SPONTANEOUS person?

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Systematic — Neither one nor the other — Spontaneous

39 B*
"When you are AT WORK is your MIND ON OTHER THINGS?"

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

40 C
Do you feel that adherence to MORAL AND ETHICAL standards will inhibit your PROFESSIONAL DEVELOPMENT?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

41 A
Do you find it DIFFICULT to attend to more than ONE THING at a time?

[SINGLE TICK ONLY]

5 4 3 2 1 0 1 2 3 4 5
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Yes, always — Neither one nor the other — No, never

Appendix A: Questionnaire for Study 1 and Study 2 cont.

The FIT Profiler Questions cont.

42 BF* Are you a OPEN-MINDED or SINGLE-MINDED person?	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Open-minded Neither one nor the other Single-minded
43 F Is there a FEARFUL FEELING at the back of your mind? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always Neither one nor the other No, never
44 SR Do you have FEELINGS OF GUILT about things you have SAID AND DONE? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always Neither one nor the other No, never
45 B "When you are away from people you care about DO YOU MISS THEM?" [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always Neither one nor the other No, never
46 BF* Are you an EXTROVERTED or INTROVERTED person?	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Very extroverted Neither one nor the other Very introverted
47 A When told SOMEONE'S NAME do you FORGET it instantly? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always Neither one nor the other No, never
48 F Do feelings of INSECURITY make you FEARFUL? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always Neither one nor the other No, never
49 SR Are you able to control any ANGRY FEELINGS you might have? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always Neither one nor the other No, never
50 BF* Are you a DEFINITE or FLEXIBLE person?	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Very definite Neither one nor the other Very flexible
51 B Do you feel that your HOME LIFE should take precedence over your WORK LIFE? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always Neither one nor the other No, never
52 C Do you think that HONESTY IS THE BEST POLICY? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always Neither one nor the other No, never

Appendix A: Questionnaire for Study 1 and Study 2 cont.

The FIT Profiler Questions cont.

53 A Do you have to READ SOMETHING MORE THAN ONCE to fully take it in? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always — Neither one nor the other — No, never
54 BF* Would you consider yourself to be a GENTLE or FIRM person?	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Very gentle — Neither one nor the other — Very firm
55 C Do you think it is possible to be ETHICAL/MORAL and SUCCESSFUL? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Very much so — Neither one nor the other — No, never
56 A How often do you BUMP INTO THINGS? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Very often — Neither one nor the other — Never
57 B Do you think that WORK should take precedence over your HOME LIFE? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always — Neither one nor the other — No, never
58 BF* Would you consider yourself to be a LIVELY PERSON?	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Not lively at all — Neither one nor the other — Very lively
59 F* Do FEARFUL FEELINGS stop you from doing things you want to do? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always — Neither one nor the other — No, never
60 SR Do you TAKE RESPONSIBILITY for what happens to you? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always — Neither one nor the other — No, never
61 C Do you feel there is a FUZZY LINE between RIGHT AND WRONG? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Very fuzzy — Neither one nor the other — Not fuzzy at all
62 A How often do you FORGET APPOINTMENTS? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Very often — Neither one nor the other — Never
63 C Would you consider doing SOMETHING IMMORAL or UNETHICAL if you could see a successful outcome? [SINGLE TICK ONLY]	5 4 3 2 1 0 1 2 3 4 5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Yes, always — Neither one nor the other — No, never

Appendix A: Questionnaire for Study 1 and Study 2 cont.

The FIT Profiler Questions cont.

64 F Does entering NEW SITUATIONS and meeting NEW PEOPLE worry you? [SINGLE TICK ONLY]	5 ☐ Yes, always	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ No, never
65 SR Do you believe that BEING IN THE RIGHT PLACE AT THE RIGHT TIME IS LUCK? [SINGLE TICK ONLY]	5 ☐ Yes, always	4 ☐	3 ☐	2 ☐	1 ☐	0 ☐ Neither one nor the other	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐ No, never

The FIT Profiler Thoughts and Feelings scale

Below are a number of statements, which refer to thoughts and feelings. Consider each one in turn. Please say how often each one applies to you over the last few weeks, using one of the given categories and tick the appropriate box next to each statement.

1. Feelings of sadness first thing in the morning.
☐ Very frequently / often
☐ Now and again
☐ Very rarely
☐ Never

2. Finding it difficult to "think on the spot" and concentrate.
☐ Very frequently / often
☐ Now and again
☐ Very rarely
☐ Never

3. Feeling low and wanting to give up trying.
☐ Very frequently / often
☐ Now and again
☐ Very rarely
☐ Never

4. Feeling as if you are "falling apart at the seams" but unsure why.
☐ Very frequently / often
☐ Now and again
☐ Very rarely
☐ Never

5. Lack of interest and enjoyment in food.
☐ Very frequently / often
☐ Now and again
☐ Very rarely
☐ Never

6. Feeling uneasy and needing to "escape".
☐ Very frequently / often
☐ Now and again
☐ Very rarely
☐ Never

7. Feeling life is difficult to cope with.
☐ Very frequently / often
☐ Now and again
☐ Very rarely
☐ Never

8. Worrying about things which causes feelings of tension and strain.
☐ Very frequently / often
☐ Now and again
☐ Very rarely
☐ Never

Appendix A: Questionnaire for Study 1 and Study 2 cont.

Section F: Environmental Concern

Please read the statements below and rate how much you agree with each one.

		Strongly disagree	Disagree	Neither	Agree	Strongly agree
1.	I worry about environmental problems					
2.	Too much attention is paid to environmental problems					
3.	The environment is one of the most important issues facing the world today					
4.	It is important that the environment is protected for future generations					
5.	Environmental problems are exaggerated					
6.	I do all I can to help protect the future of the environment					
7.	I care about the environment					
8.	I am concerned about the future of the environment					
9.	When I am at work I think about the environmental impact of my behaviours					
10.	When I am at home I think about the environmental impact of my behaviours					

Section G: The New Ecological Paradigm

Please read the following statements and indicate the extent that you agree or disagree with each statement.

		Strongly disagree	Mildly disagree	Unsure	Mildly agree	Strongly agree
1.	We are approaching the limit of the number of people the earth can support					
2.	Humans have the right to modify the natural environment to suit their needs					
3.	When humans interfere with nature it often produces disastrous consequences					
4.	Human ingenuity will insure that we do NOT make the earth unliveable					
5.	Humans are severely abusing the environment					
6.	The earth has plenty of natural resources if we just learn how to develop them					
7.	Plants and animals have as much right as humans to exist					
8.	The balance of nature is strong enough to cope with the impacts of modern industrial nations					
9.	Despite our special abilities humans are still subject to the laws of nature					
10.	The so-called “ecological crisis” facing humankind has been greatly exaggerated					
11.	The earth is like a spaceship with very limited room and resources					
12.	Humans were meant to rule over the rest of nature					
13.	The balance of nature is very delicate and easily upset					
14.	Humans will eventually learn enough about how nature works to be able to control it					
15.	If things continue on their present course, we will soon experience a major ecological catastrophe					

Appendix A: Questionnaire for Study 1 and Study 2 cont.

Section H: Biographic and Lifestyle Information

How environmentally friendly do you think you are at home? (please circle the appropriate number)

0	1	2	3	4	5	6	7	8	9	10
Not environmentally friendly at all									Very environmentally friendly	

How environmentally friendly do you think you are at work? (please circle the appropriate number)

0	1	2	3	4	5	6	7	8	9	10
Not environmentally friendly at all									Very environmentally friendly	

1. What is your age today? ……
2. Are you …? ❑ Male or ❑ Female
3. Please indicate your ethnicity.

   White ❑ British ❑ Irish ❑ Welsh

   Mixed ❑ White & Black Caribbean ❑ White & Asian ❑ White and Black African ❑ Other Mix

   Asian or Asian British ❑ Indian ❑ Bangladeshi ❑ Pakistan ❑ Other Asian background

   Black or British Black ❑ Caribbean ❑ African ❑ Other Black background

   Chinese ❑ Chinese

   Other ❑ Please specify ……..
4. What is your marital status? ❑ Single ❑ Married ❑ Divorced ❑ Living with partner ❑ In a relationship ❑ Widowed
5. What is your highest educational qualification? ❑ GCSEs or equivalent ❑ A-Levels or equivalent ❑ Bachelors degree ❑ Masters degree ❑ PhD or higher ❑ I don't have any
6. Is your job … ? ❑ Administrative/secretarial ❑ Professional ❑ Managerial ❑ Unemployed ❑ At home with the children ❑ Self-employed ❑ Studying/in education
7. Is your job … ? ❑ Full time ❑ Part time
8. What is your annual income? ❑ £0-10,000 ❑ £10,001-20,000 ❑ £20,001-£30,000 ❑ £30,001-£40,000 ❑ £40,001-£50,000 ❑ £50,001+
9. Does the company you work for have an environmental policy? ❑ Yes ❑ No ❑ Not applicable
10. What type of property do you live in? ❑ Terraced house ❑ Semi-detached house ❑ Detached house ❑ Room in a shared house/student halls ❑ Flat/apartment/maisonette ❑ Other
11. Is this property … ❑ Owned by you ❑ Rented ❑ Owned by your parents ❑ Student halls ❑ Other

Appendix A: Questionnaire for Study 1 and Study 2 cont.

Participant Debrief

Many thanks for completing The FIT GAP.

You will have noticed that throughout the questionnaire you were asked about your beliefs and behaviours in relation to a range of activities. Most of these were simple everyday activities that could, if performed, help to protect the environment.

The purpose of this questionnaire is to identify which activities people think are important for protecting the environment and also to identify which activities they actually perform. It is often the case that people do not do what they think is important, that is their beliefs and behaviours do not correspond. In other words, people are not coherent in what they think and how they behave. In order to protect the environment or at least lessen the impact of human behaviour upon the environment, it is important that people consider the environment in their daily behaviours. This study, by identifying the extent of people's environmental beliefs and behaviours, will also identify when people don't consider the environment in their thoughts and actions. It is then possible to mediate and modify these inactions to develop a more coherent set of environmental beliefs and behaviours, something that is important for a more sustainable society overall.

If you would like further information about this questionnaire or the programme of research please contact the researcher.

Appendix B: Questionnaire for Study 3

Participant Information

We are researchers from the University of Hertfordshire undertaking a study exploring the factors that influence energy consuming behaviours in the home.

If you agree to take part in this study, you will be asked to complete a survey that lists 15 factors that might influence your behaviours in relation to energy consumption in the home. You will be asked to rank order each factor according to how strongly it influences your behaviour. There will be two scales, one for your current attitude and one for how you think you will see things in 2-years' time.

If you agree to take part you will be asked to complete the survey. This will take approximately 20 minutes.

Any data you do provide today will remain both confidential and anonymous and will only be used for the purposes outlined here.

If you do not wish to contribute to this research project you can exit the survey and take no further action.

If you participate, you may use the email addresses below should you have any queries or concerns now or at a later date.

Please note that any information you may supply today will only be used for the purposes outlined here. Participation in the study is voluntary and you may withdraw your assistance at any time if you wish and without explanation.

Consent: If you give your full consent to take part (with the full understanding that you may withdraw at any time without giving a reason) please continue with the survey after reading the following:

I understand that if I withdraw from the study, the data I have submitted will also be withdrawn at my request. I have read the above information explaining what the study entails and what will be expected from me.

I understand that the information that I submit will be confidential, and used only for this study. I have read and understood the above information.

I agree to participate in this study.

Thank you in advance for your participation.

The researchers.

This study has been approved by the School of Psychology Ethics Committee Registration Protocol Number: PSY/09/09/NP/NR study 28-08-09.

Section A: Biographic and Lifestyle Information

1. Gender: ❑ Male ❑ Female
2. Age: ❑ 18-30 ❑ 31-50 ❑ 51-65 ❑ Over 65
3. Where are you living? ❑ In a property owned by you ❑ In a property owned by your parents ❑ In rented accommodation ❑ In student halls ❑ Other
4. Do you have an 'environmental policy' at your place of work/study? ❑ Yes ❑ No ❑Don't know ❑ Not applicable
5. Are you a student at the University of Hertfordshire? ❑ Yes ❑ No
6. Are you a member of staff at the University of Hertfordshire? ❑ Yes ❑ No

Appendix B: Questionnaire for Study 3 cont.

Section B: Factors Influencing Energy Consumption

Respondents completed this scale twice. First, with consideration to their current energy consumption, and second, with consideration to their future energy consumption.

Participant Instructions

Please rank the 15 items listed below in terms of how much they influence you personally now in saving energy in your home. (Please rank the 15 items listed below in terms of how much you think they will influence you personally in 2-years' time in saving energy in your home).

The easiest way to do this is to look through the list and select the item you think is most important and tick 1 on the scale next to it. Then look for the item you think is next most important and tick 2 on the scale next to that item and so on until you reach 15. The item you rank as number 1 should be the most important and the item you rank as number 15 should be the least important.

Do not agonise over the ranking process. Your initial view of the correct ranking to give is probably the right one.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Feedback from my energy company(s) showing me the amount of energy used by each of my electrical appliances															
The attitudes and behaviour of friends and family															
My sense of social responsibility															
Believing that climate change is man-made															
Financial rewards for reducing energy consumption															
My willingness to change my lifestyle															
Clear and practical information on how to save energy															
My belief that there is a need to save energy															
My financial resources															
Availability of grants for making my property more energy efficient, e.g., double-glazing, cavity wall insulation, loft insulation															
Belief in the reality of climate change															
Government and local authorities leading by example															
The price of electricity and gas etc.															
Believing my actions will make a difference															
Financial penalties for excessive consumption															

Participant Debrief

Many thanks for completing the survey. The study is exploring the factors that influence energy use in the home. We are particularly interested in how much influence different factors have on behaviour.

Do you have any further questions?

You may contact us in the future on:

The Researchers

Appendix C: Questionnaire for Study 4

Participant Information

I am a PhD student at the University of Hertfordshire undertaking a study exploring the factors that influence personal energy consuming behaviours at home and in the workplace.

The study involves completing an online survey consisting of 3 different scales.

The first scale consists of factors that might influence your behaviours in relation to energy consumption at HOME. The second scale consists of factors that might influence your behaviours in relation to energy consumption at WORK. For both scales, you will be asked to rank order each factor according to how strongly it influences your energy consumption in each context. The final scale consists of 20 items which will assess your general thinking and behavioural tendencies. This is called The FIT Profiler. Lastly, you will be asked to provide some demographic information about yourself.

The survey takes approximately 15 minutes to complete.

If you agree to participate, any data you do provide will remain both confidential and anonymous and will be used only for the purposes outlined here. Your responses will not be identifiable to you as an individual.

If you do not wish to contribute to this research project you can exit the survey and take no further action.

If you participate you may use the email address below should you have any queries or concerns now or at a later date.

Please note that any information you may supply today will only be used for the purposes outlined here, participation in this study is voluntary and you may withdraw your assistance at any time if you wish and without explanation.

Consent: If you give your full consent to take part (with full understanding that you may withdraw at any time without giving reason) please continue the survey after reading the following:

I understand that if I withdraw from the study, the data I have submitted will also be withdrawn at my request. I have read the above information explaining what the study entails and what will be expected from me. I understand that the information I submit will be confidential, and used only for this study. I have read and understood the above information.

I agree to participate in this study.

Thank you in advance for you participation.

Researcher:

This study has been approved by the University of Hertfordshire's School of Psychology Ethics Committee. Registration Protocol Number: PSY/01/11/SA

Appendix C: Questionnaire for Study 4 cont.

Section A: Home Energy Consumption

Please rank the 12 items below in terms of how much they influence you personally in saving energy in your home.

The easiest way to do this is to look through the list and select the item you think is most important and tick 1 on the scale next to it. Then look for the item you think is next most important and tick 2 on the scale next to that item and so on until you reach 15. The item you rank as number 1 should be the most important and the item you rank as number 15 should be the least important.

Do not agonise over the ranking process. Your initial view of the correct ranking to give is probably the right one.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Feedback from my energy company(s) showing me the amount of energy used by each of my electrical appliances												
The attitudes and behaviour of friends and family												
My sense of social responsibility												
Believing that climate change is man-made												
Financial rewards for reducing energy consumption												
My willingness to change my lifestyle												
Clear and practical information on how to save energy												
My belief that there is a need to save energy												
My financial resources												
Availability of grants for making my property more energy efficient, e.g., double-glazing, cavity wall insulation, loft insulation												
Belief in the reality of climate change												
Government and local authorities leading by example												
The price of electricity and gas etc.												
Believing my actions will make a difference												
Financial penalties for excessive consumption												

Appendix C: Questionnaire for Study 4 cont.

Section B: Work Energy Consumption

Please rank the 12 items below in terms of how much they influence you personally in saving energy in your place of work.

The easiest way to do this is to look through the list and select the item you think is most important and tick 1 on the scale next to it. Then look for the item you think is next most important and tick 2 on the scale next to that item and so on until you reach 15. The item you rank as number 1 should be the most important and the item you rank as number 15 should be the least important.

Do not agonise over the ranking process. Your initial view of the correct ranking to give is probably the right one.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Respect of environmental policies at work												
The attitudes and behaviour of friends of fellow colleagues												
My sense of social responsibility												
Believing that climate change is man-made												
Feedback from my employer on the amount of energy saved annually												
The attitudes and behaviour of superiors												
My sense of responsibility to my employer												
My belief that there is a need to save energy commercially												
My willingness to participate in workplace environmental actions												
Avoidance of disciplinary action from my employer for not following environmental policies												
Belief in the reality of climate change												
Training to give clear and practical information in order to carry out environmental policies												
Reward scheme in the workplace for correctly following environmental policies												
Believing my actions will make a difference												
Management/superiors leading by example												

Section C: The shortened version of The FIT Profiler (see Appendix A)

Section D: Home and Work Environmental Behaviour

How often do you carry out the following activities at home/work?

	Always	**Occasionally**	**Often**	**Never**	**N/A**
Think before printing					
Print/photocopy double-sided					
Use scrap paper (for notes/internal document printing)					
Turn the monitor off when not in use e.g., at meetings, lunch					
Switch off IT equipment over night					
Turn the lights off					
Reuse packaging or stationery (envelopes/folders etc.)					

Appendix C: Questionnaire for Study 4 cont.

Section E: Biographic and Lifestyle Information

1. Gender: ❑ Male ❑ Female

2. Age: ❑ 16-30 ❑ 31-50 ❑ 51-65 ❑ Over 65

3. Where are you living? ❑ In a property owned/mortgaged by you ❑ In a property owned/mortgaged by your parents ❑ In privately rented accommodation ❑ In university rented accommodation ❑In student halls ❑ Other

4. What is your type of employment? ❑ Full time ❑ Part time ❑ Temporary ❑ Zero-contract (on call) ❑ Student/in education ❑ Unemployed

5. How long have you been working for your current employer? ❑ 0-12 months ❑ 1-5 years ❑ 6-10 years ❑ 11-20 years ❑ 21-30 years ❑ 31 years and over ❑ N/A

6. The type of company that best applies to your current employer? ❑ Independent business ❑ Public sector ❑ National corporate business ❑ Small/medium enterprise ❑ N/A

7. What type of work do you do? ❑ Unskilled (minimal training) ❑ Partially skilled (moderate amount of training) ❑ Skilled (highly specialised training) ❑ N/A

8. What position at work do you hold? ❑ Basic level employee ❑ Middle management ❑ Supervisory ❑ Higher management ❑ N/A

9. At work, do you usually work as… ❑ A team ❑ Individually ❑ N/A

10. Do you have an 'environmental policy' at your place of work/study? ❑ Yes ❑ No ❑Don't know ❑ Not applicable

11. How much personal responsibility do you feel towards the environment while you are at work? ❑ A lot ❑ Quite a lot ❑ A little ❑ None ❑ N/A

12. How much personal responsibility do you feel towards the environment while you are at home? ❑ A lot ❑ Quite a lot ❑ A little ❑ None ❑ N/A

Participant Debrief

Thank you for taking the time to complete this survey. This study is exploring the factors that influence energy use in the home and workplace, and how they may differ. It also compares the way in which you behave and think to your environmental concern, based on how you ranked each factor in the last two scales.

If you wish to be informed as to the outcome of this study or have any further questions about this study or the information you provided, then you can contact the researcher using the details below.

Researcher.

Appendix D: Questionnaire for Study 5

Participant Information

I am a PhD student at the University of Hertfordshire undertaking a study exploring the strength of habit for a range of pro-environmental behaviours and the factors that influence performance of these.

The questionnaire is composed of several different scales.

The first scale type is the Self-Report Habit Index. This measures the habit characteristics of behaviours. You will be asked to complete this scale for 7 different pro-environmental behaviours.

The second scale is a ranking scale. This scale consists of factors that might influence the pro-environmental behaviour identified. In this scale you will be asked to rank order each factor according to how strongly it influences the identified pro-environmental behaviour.

The final scale consists of 20 items, which will assess your general thinking and behavioural tendencies. This is called The FIT Profiler. Lastly, you will be asked to provide some demographic information about yourself.

The survey takes approximately 30 minutes to complete.

If you agree to participate, any data you do provide will remain both confidential and anonymous and will be used only for the purposes outlined here. Your responses will not be identifiable to you as an individual.

If you do not wish to contribute to this research project you can exit the survey and take no further action.

If you participate you may use the email address below should you have any queries or concerns now or at a later date.

Please note that any information you may supply today will only be used for the purposes outlined here, participation in this study is voluntary and you may withdraw your assistance at any time if you wish and without explanation.

Consent: If you give your full consent to take part (with full understanding that you may withdraw at any time without giving reason) please continue the survey after reading the following:

I understand that if I withdraw from the study, the data I have submitted will also be withdrawn at my request. I have read the above information explaining what the study entails and what will be expected from me. I understand that the information I submit will be confidential, and used only for this study. I have read and understood the above information.

I agree to participate in this study.

Thank you in advance for you participation.

Researcher:

This study has been approved by the University of Hertfordshire's School of Psychology Ethics Committee. Registration Protocol Number: PSY/01/11/KM

Appendix D: Questionnaire for Study 5 cont.

Section A: Life Activities Scale

Below is a list of everyday activities. Please rate each activity in two ways:

1. the degree to which you consider each activity as a habit (habit score)
2. how frequently you perform the activity (frequency score)

Please use the following scales for your answers:

Habit score		**Frequency score**	
I don't do X	= 1	Never	= 1
I do X but I don't consider it a habit	= 2	At least once a month	= 2
X is a weak habit	= 3	At least once a week	= 3
X is a habit	= 4	At least once a day	= 4
X is a strong habit	= 5	More than once a day	= 5

Activity	**Habit score (1-5)**	**Frequency score (1-5)**
Watching TV		
Reading books/newspapers/magazines		
Listening to music/radio		
Socialising with friends		
Exercising		
Talking on the phone		
Checking emails		
Surfing the internet		
Playing computer games		
Shopping		

Appendix D: Questionnaire for Study 5 cont.

Section B: Preference for Routine

Please answer the following questions using the rating scale provided.

Generally speaking…	Very rarely	Rarely	Sometimes	Often	Most of the time
1. …do you stick to the same routine when getting ready in the morning?					
2. …do you get upset when someone disrupts your plans?					
3. …are you 'set in your ways'?					
4. …do you have the same breakfast every morning (or go without breakfast every day)?					
5. …do you 'go with the flow' when you are with friends?					
6. …do you think your ways of doing things are the best?					
7. …do you have the same drink first thing in the morning (e.g., tea, coffee, fruit juice)?					
8. …are you happy to try different ways of doing things?					
9. …if friends or family turn up unannounced are you happy to see them?					
10. …would it be easy for someone to convince you to change your views on something?					
11. …once you have found a journey to work that you feel comfortable with, do you always go that way?					
12. …do you like to have your days planned?					

Section C: Self-Report Habit Index

Respondents completed the Self-Report Habit Index for 7 different pro-environmental behaviours (recycling materials, turning lights off, turning taps off, turning electrical equipment off, walking, cycling or using public transport rather than the car, car-pooling/sharing for journeys, recycling equipment).

Please answer the following statements using the rating scale provided.
Pro-environmental behaviour X is something…

	Agree						**Disagree**
	1	**2**	**3**	**4**	**5**	**6**	**7**
I do frequently							
I do automatically							
I do without having to consciously remember							
That makes me feel weird if I do not do it							
I do without thinking							
That would require effort not to do it							
That belongs to my (daily, weekly, monthly) routine							
I start doing before I realise I'm doing it							
I would find hard not to do							
I have no need to think about doing							
That's typically me							
I have been doing for a long time							

Appendix D: Questionnaire for Study 5 cont.

Section D: Pro-environmental Behaviour Ranking Scales

Respondents completed the Pro-environmental Behaviour Ranking Scales for 7 different pro-environmental behaviours (recycling materials, turning lights off, turning taps off, turning electrical equipment off, walking, cycling or using public transport rather than the car, car-pooling/sharing for journeys, recycling equipment).

Please rank the 9 items listed below in terms of how much they influence you personally in *recycling materials (e.g., paper, plastic, cardboard and glass)*.

The easiest way to do this is to look through and select the item YOU think is the most important and put a 1 on the scale next to that item. Then look for the item you think is next most important and put a 2 on the scale next to that item and so on until you reach 9. The item you rank as number 1 should be the most important and the item you rank as number 9 should be the least important.

You cannot use the same number more than once and you cannot have equal rankings.

Do not agonize over the ranking process; your initial view of the correct ranking to give is probably the right one.

How much does each of the following factors influence your *pro-environmental XX*?

	Ranking (1-9)
The attitudes and behaviour of my friends and family	
My sense of social responsibility	
My believing that climate change is man-made	
My willingness to change my lifestyle	
Clear and practical information on how to recycle	
My belief that there is a need to recycle	
My belief in the reality of climate change	
Government and local authorities leading by example	
Believing my actions will make a difference	

Section E: The shortened version of The FIT Profiler (see Appendix A)

Section F: Biographic and Lifestyle Information (see Appendix C)

Participant Debrief

Thank you for taking the time to complete this survey. This study is exploring the habit characteristics of pro-environmental behaviour and factors that influence these, and how they may differ.

If you wish to be informed as to the outcome of this study or have any further questions about this study or the information you provided, then you can contact the researcher using the details below.

Researcher.

Appendix E: Study 5 – Factor Analyses of the Pro-Environmental Habits

In an attempt to explore further the influence of intrinsic and extrinsic variables on pro-environmental activity, and simplify the pattern of results, a Factor Analysis (FA) using an Unweighted Least Squares (ULS) method with Varimax rotation was applied to the ranking scale for each pro-environmental behaviour. The analysis was conducted to identify the underlying factor structure of the variables and to compare and contrast this across pro-environmental behaviours. It sought to identify the common variance amongst the items rather than the total variance.

Recycling materials

For the pro-environmental behaviour 'recycling materials', the data proved suitable for FA; there was a good level of common variance amongst the items (range = 28-43%), with the communalities after extraction remaining high (range = 12-99%). The Eigenvalue criterion suggested the retention of 4 factors that accounted for 67% of the common variance (Factor 1 = 22.37%; Factor 2 = 16.40%; Factor 3 = 15.19%; Factor 4 = 13.47%). The Scree plot also confirmed the retention of 4 factors, although not unambiguously. The loading of individual items onto the Factors was simplified by a Varimax rotation (Table 5.9). The items loaded relatively evenly onto the factors. Led by the strongest loading factor, the following factor labels were allocated. Factor 1 was interpreted as Self-efficacy to Change Behaviour. Factor 2 was interpreted as Beliefs about Recycling. Factor 3 was interpreted as Social Influence. Factor 4 was interpreted as Good Citizenship.

Table 1E. Study 5 – Factor loadings for Exploratory Factor Analysis with Varimax rotation of the 'recycling materials' scale (*N* = 95)

Scale item	F1 Self-efficacy to change behaviour	F2 Beliefs about recycling	F3 Social influence	F4 Good citizenship
The attitudes and behaviour of my friends and family			.74	
My sense of social responsibility				.49
My believing that climate change is man-made				.60
My willingness to change my lifestyle	-.35			
Clear and practical information on how to recycle	-.32			
My belief that there is a need to recycle		.99		
My belief in the reality of climate change			.56	
Government and local authorities leading by example				.55
Believing my actions will make a difference	.94			

Appendix E: Study 5 – Factor Analyses of the Pro-Environmental Habits

Turning lights off

For the pro-environmental behaviour 'turning lights off', the data proved suitable for FA; there was a good level of common variance amongst the items (range = 26-47%), with the communalities after extraction remaining high (range = 17-99%). The Eigenvalue criterion suggested the retention of 4 factors that accounted for 69% of the common variance (Factor 1 = 26.30%; Factor 2 = 17.18%; Factor 3 = 13.97%; Factor 4 = 11.65%). The Scree plot also confirmed the retention of 4 factors, although not unambiguously. The loading of individual items onto the factors was simplified by a Varimax rotation (see Table 5.10). The items loaded relatively evenly onto the factors. Led by the strongest loading factor, the following factor labels were allocated. Factor 1 was interpreted as Social Influence. Factor 2 was interpreted as Good Citizenship. Factor 3 was interpreted as Personal Beliefs. Factor 4 was interpreted as Self-efficacy to Change Behaviour.

Table 2E. Study 5 – Factor loadings for Exploratory Factor Analysis with Varimax rotation of the 'turning lights off' scale (N = 95)

Scale item	F1 Social influence	F2 Perceived reality	F3 Personal beliefs	F4 Self-efficacy to change behaviour
The attitudes and behaviour of my friends and family	1.01			
My sense of social responsibility			.65	
My believing that climate change is man-made		.99		
My willingness to change my lifestyle				-.40
Clear and practical information on saving energy			-.45	
My belief that there is a need to save energy			-.58	
My belief in the reality of climate change	-.39			
Government and local authorities leading by example		-.30		
Believing my actions will make a difference				.69

Turning taps off

For the pro-environmental behaviour 'turning taps off', the data proved suitable for FA; there was a good level of common variance amongst the items (range = 37-53%), with the communalities after extraction remaining high (range = 15-99%). The Eigenvalue criterion suggested the retention of 3 factors that accounted for 62% of the common variance (Factor 1 = 32.32%; Factor 2 = 16.36%; Factor 3 = 13.47%). The Scree plot also confirmed the retention of 3 factors, although not unambiguously. The loading of individual items onto the factors was

simplified by a Varimax rotation (see Table 5.11). The items loaded relatively evenly onto the factors. Led by the strongest loading factor, the following factor labels were allocated. Factor 1 was interpreted as Good Citizenship. Factor 2 was interpreted as Belief in Human Impact. Factor 3 was interpreted as Willingness and Ability to Change Behaviour.

Table 3E. Study 5 – Factor loadings for Exploratory Factor Analysis with Varimax rotation of the 'turning taps off' scale (*N* = 95)

Scale item	F1 Good citizenship	F2 Belief in human impact	F3 Willingness and ability to change behaviour
The attitudes and behaviour of my friends and family	-.68		
My sense of social responsibility			-.60
My believing that climate change is man-made		.99	
My willingness to change my lifestyle	-.46		
Clear and practical information on how to save water			.77
My belief that there is a need to save water			.29
My belief in the reality of climate change	.67		
Government and local authorities leading by example	.38		
Believing my actions will make a difference		-.56	

Turning off electrical appliances

For the pro-environmental behaviour 'turning off electrical appliances', the data proved suitable for FA; there was a good level of common variance amongst the items (range = 30-57%), with the communalities after extraction remaining high (range = 19-84%). The Eigenvalue criterion suggested the retention of 3 factors that accounted for 62% of the common variance (Factor 1 = 33.42%; Factor 2 = 15.60%; Factor 3 = 12.78%). The Scree plot also confirmed the retention of 3 factors although not unambiguously. The loading of individual items onto the factors was simplified by a Varimax rotation (see Table 5.12). The majority of the items loaded onto the first factor. Led by the strongest loading factor, Factor 1 was interpreted as Personal Beliefs. Factor 2 was interpreted as Good Citizenship. Factor 3 was interpreted as How to Save Energy.

Appendix E: Study 5 – Factor Analyses of the Pro-Environmental Habits

Table 4E. Study 5 – Factor loadings for Exploratory Factor Analysis with Varimax rotation of the 'turning off electrical appliances' scale (N = 95)

Scale item	F1 Personal beliefs	F2 Good citizenship	F3 How to save energy
The attitudes and behaviour of my friends and family	-.59		
My sense of social responsibility		-.59	
My believing that climate change is man-made		-.36	
My willingness to change my lifestyle	-.33		
Clear and practical information on how to reduce energy consumption			.70
My belief that there is a need to reduce energy consumption	.53		
My belief in the reality of climate change	.52		
Government and local authorities leading by example		.92	
Believing my actions will make a difference	.62		

Walk, cycle or use public transport rather than using the car

For the pro-environmental behaviour 'walk, cycle or use public transport rather than using the car', the data proved suitable for FA; there was a good level of common variance amongst the items (range = 31-56%), with the communalities after extraction remaining high (range = 10-99%). The Eigenvalue criterion suggested the retention of 3 factors that accounted for 62% of the common variance (Factor 1 = 34.96%; Factor 2 = 14.88%; Factor 3 = 12.61%). The Scree plot also confirmed the retention of 3 factors although not unambiguously. The loading of individual items onto the factors was simplified by a Varimax rotation (see Table 5.13). The majority of the items loaded onto the first factor. Led by the strongest loading factor, Factor 1 was interpreted as Good Citizenship. Factor 2 was interpreted as Self-efficacy. Factor 3 was interpreted as Carbon Reduction.

Table 5E. Study 5 – Factor loadings for Exploratory Factor Analysis with Varimax rotation of the 'walk, cycle or use public transport rather than using the car' scale (*N* = 95)

	F1 Good citizenship	F2 Self-efficacy	F3 Carbon reduction
The attitudes and behaviour of my friends and family	-.59		
My sense of social responsibility	-.71		
My believing that climate change is man-made		-.51	
My willingness to change my lifestyle	-.31		
Clear and practical information on how to reduce carbon emissions			.39
My belief that there is a need to reduce carbon emissions			.66
My belief in the reality of climate change	.59		
Government and local authorities leading by example	.78		
Believing my actions will make a difference		.96	

Appendix E: Study 5 – Factor Analyses of the Pro-Environmental Habits

Car-pooling/car sharing

For the pro-environmental behaviour 'car-pooling/sharing', the data proved suitable for FA; there was a good level of common variance amongst the items (range = 26-63%), with the communalities after extraction remaining high (range = 12-99%). The Eigenvalue criterion suggested the retention of 3 factors that accounted for 66% of the common variance (Factor 1 = 39.54%; Factor 2 = 15.67%; Factor 3 = 11.16%). The Scree plot also confirmed the retention of 3 factors although not unambiguously. The loading of individual items onto the factors was simplified by a Varimax rotation (see Table 5.14). The majority of the items loaded onto the first factor. Led by the strongest loading factor, Factor 1 was interpreted as Good Citizenship. Factor 2 was interpreted as Belief in Human Impact. Factor 3 was interpreted as Taking Action.

Table 6E. Study 5 – Factor loadings for Exploratory Factor Analysis with Varimax rotation of the 'car-pooling/car sharing' scale (*N* = 95)

	F1	F2	F3
Scale item	Good Citizenship	Belief in human impact	Taking action
The attitudes and behaviour of my friends and family	-.72		
My sense of social responsibility	-.86		
My believing that climate change is man-made		.99	
My willingness to change my lifestyle	-.41		
Clear and practical information on how to reduce carbon emissions			.72
My belief that there is a need to reduce carbon emissions	.28		
My belief in the reality of climate change	.75		
Government and local authorities leading by example	.69		
Believing my actions will make a difference	.47		

Recycling equipment

For the pro-environmental behaviour 'recycling equipment', the data proved suitable for FA; there was a good level of common variance amongst the items (range = 26-64%), with the communalities after extraction remaining high (range = 28-84%). The Eigenvalue criterion suggested the retention of 2 factors that accounted for 53% of the common variance (Factor 1 = 38.40%; Factor 2 = 15.07%). The Scree plot also confirmed the retention of 2 factors. The loading of individual items onto the factors was simplified by a Varimax rotation (see Table 5.15). Factor 1 was interpreted as Good Citizenship. Factor 2 was interpreted as Willingness and Ability to Change Behaviour.

Appendix E: Study 5 – Factor Analyses of the Pro-Environmental Habits

Table 7E. Study 5 – Factor loadings for Exploratory Factor Analysis with Varimax rotation of the 'recycling equipment' scale (N = 95)

Scale item	F1 Good citizenship	F2 Willingness and Ability to Change Behaviour
The attitudes and behaviour of my friends and family	.51	
My sense of social responsibility		-.75
My believing that climate change is man-made	.50	
My willingness to change my lifestyle	.42	
Clear and practical information on how to recycle		.45
My belief that there is a need to recycle		.37
My belief in the reality of climate change	-.44	
Government and local authorities leading by example	-.69	
Believing my actions will make a difference	-.90	

The results from the FAs show that each pro-environmental behaviour has a different factor structure with the number of underlying dimensions ranging from 2-4. The amount of variance explained by these factors was similar, ranging from 53-69%. Overall, there was a large degree of similarity across the different pro-environmental behaviours. For most of the pro-environmental behaviours there was one dominant Factor that explained the largest proportion of the variance. This Factor tended to include a mixture of both intrinsic variables, such as personal beliefs and values, and extrinsic factors, such as the attitudes and behaviours of friends, family and other role models.

Appendix F: The Dos of the Do Something Greener Programme

The daily Dos designed to develop levels of Awareness

Awareness is about knowing what you want, and monitoring your actions to maximise your ability to achieve it. It also means being in tune with the effect you have on other people and "reading" the situation you are in so that you can behave appropriately. Awareness stops you from going through life on 'automatic pilot' and allows you to lead a more intentional life.		
Generic Dos	C_Aw1	Spend 5 minutes sitting down with your eyes closed and listening to all the sounds around you. What do you hear? Notice what thoughts go through your head. How do these make you feel? Fearful? Excited? Motivated? De-motivated? Jot down your thoughts or tell somebody about your experience.
	C_Aw2	Pay particular attention to the body language, expression or tone of voice of people around you today. What is this "telling" you about their state of mind? Adapt your behaviour accordingly. Record your thoughts; what did you do differently and what effect did this have?
	C_Aw3	In a situation you are in regularly (e.g., a team meeting at work, family meal time), imagine it's the first time you've been there. What did you see, that you didn't see before? How might the situation look from another person's point of view or in a different context? Record your thoughts.
	C_Aw4	Pay attention to things you wouldn't normally notice today. Pick 5 different 'things' to focus on. For instance, the texture of the paper your favourite magazine is printed on, the fabric of your clothes or the materials that your furniture is made from. Jot down 3 ways that these could be made differently, i.e., from different materials, with a different texture. Think about what impact this would have.
	C_Aw5	Attend more closely to the routine tasks you perform at home or work today. Imagine you're explaining to someone else what you're doing, and why you're doing it this way. Write a letter to them describing one of your routines.
Green Dos	C_Aw6	Take the time to count the number of lights and/or appliances that are turned on at your home/workplace. Do they need to be on? When do they go off? And who controls them? Find out and discuss this with your family/colleagues.
	C_Aw7	Find out the temperature your home/workplace is kept at. Could it be a bit cooler in winter or a bit warmer in summer? Discuss this with your family/colleagues.

The daily Dos designed to develop levels of Balance

Balance is being able to focus on what you want, but not at the cost of other areas in your life. It might involve getting a good balance between your work and social life or focusing on the most important aspects of these and eliminating less productive activities.		
Generic Dos	C_Bal1	Don't be too task-orientated today: spend time building key relationships with people who matter to you. This could mean asking someone (a friend, family member or work colleague) to join you for lunch, or taking time to offer support/coaching to another person who might benefit from this or spending an extra 5 minutes listening to another person's opinion.
	C_Bal2	Plan a day or night out with someone you like spending time with. This might be a member of your family, a good friend or a work colleague. Do it one day this week.
	C_Bal3	Write down and evaluate the importance of everything you do on a daily basis at home or work. Everything from your routine activities to your chosen past times. Is each and everything you do worth the effort? Don't do the most effortful activity today or do it differently to make it easier.
	C_Bal4	Re-establish a neglected friendship that once meant a lot to you. Make contact with this person today.
	C_Bal5	Don't be a perfectionist today. Recognise that "the best is the enemy of the good enough" and give yourself permission to take small short cuts with less important tasks. For example, this might mean cutting back on the amount of household chores you do or putting less effort into a report that people might not take the time to read. Spend sufficient time completing your chosen task so that it is good enough but not perfect.
Green Dos	C_Bal6	Incorporate exercise and enjoyment into your daily travel one day this week. Try public transport, walking, cycling or car sharing. Keep a travel diary of how, when and where you did this. Was it easy?
	C_Bal7	Do something "low carbon" with your family, friends or colleagues. This might be going out for a walk with colleagues at lunchtime or taking a cycle ride with your family at the weekend. Take a photo of yourself doing it.

Appendix F: The Dos of the Do Something Greener Programme

The daily Dos designed to develop levels of Conscience

Conscience is your personal values and sense of right and wrong, and doing the "right thing". For example, behaving with integrity, respecting the rights of others or not doing something compromising, just because others do so. This is not being judgemental, but having a clear set of personal values by which you live.		
Generic Dos	C_Con1	Analyse the situation before reacting today. Count to 10 before reacting and during that time think about if what you are about to do, or say, would be acceptable if someone were to say it to you. Was this easy to do? Did it make you change your response?
	C_Con2	Don't persuade yourself that doing something questionable is OK today, just because someone else says it is. Do what you believe is right today. What did you do differently?
	C_Con3	Speak up for something you believe in today, even if what you have to say might challenge someone else. This might be voicing a different opinion to a family member or a work colleague. What impact did this have?
	C_Con4	Give people praise and credit where it is due today. Don't put people down or feel jealous if someone has achieved something.
	C_Con5	If you're not sure what is the right thing to do, think about someone you admire. Ask yourself "What would they do in this situation?"
Green Dos	C_Con6	Organise a discussion about the ethics of climate change with your family, friends or work colleagues. Who is responsible and who is likely to suffer? Think about the impact it would have on your lifestyle.
	C_Con7	Imagine that you could see carbon dioxide. Visualise the results and draw a picture of the effects. How would this affect your lifestyle or your company's activities? Think about what you could do differently.

The daily Dos designed to develop levels of Fearlessness

Fear is often what holds us back in life. Fearlessness is not allowing fear to govern your life. It's about approaching the unknown in the same way as the known. Often we are fearful because we haven't done something before. The best way to tackle our fears is to break the challenge down in small steps. The Fearlessness Dos are designed to help you tackle your worries in easy stages. Once you have completed the first exercise, and realise "nothing bad happens", you will feel much more confident about taking the next step. In this way, the fear is progressively reduced.		
Generic Dos	C_Fear1	Today, say 'no' to someone who takes advantage of you or who expects too much of you, even if the prospect is somewhat frightening.
	C_Fear2	Do something you've put off for ages because of your fears today. This might be starting to exercise, going for a health check-up or dealing with a financial problem.
	C_Fear3	Talk about a difficult subject with someone. This could be about anything that scares you or makes you feel uncomfortable.
	C_Fear4	Do something on your own that you normally would be "afraid" to do, e.g., go to the cinema, speak up at a meeting or join a new community group or evening class.
	C_Fear5	Do something that challenges you today. This could be starting a conversation with a work colleague or neighbour who you have never spoken to before, or going to a different exercise or evening class.
Green Dos	C_Fear6	Take on a specific green challenge today. For example, find out about switching your energy to a green supplier or change your bank to an ethical provider.
	C_Fear7	If you think that someone is behaving in an environmentally irresponsible way, tell them! This might be telling a member of your family or a work colleague to recycle their waste or turn off their electrical equipment rather than leaving it on standby.

Appendix F: The Dos of the Do Something Greener Programme

The daily Dos designed to develop levels of Self-responsibility

Self-responsibility is accepting that what happens in your life is largely down to one person – you. It's about taking control of your habits, expectations and behaviours. Taking responsibility allows you to take charge of your life and not be a victim. Everyone has failures and setbacks to deal with, but it is what we "do" with these that is important. FIT people see difficult times as an opportunity to learn what to do better next time.		
Generic Dos	C_SelfR1	Don't wait for someone else to make a start with something that needs to be done. Take the initiative and do it yourself today. This might be a DIY or gardening job you've been waiting for or a new project at work.
	C_SelfR2	Take the first step to repair a damaged relationship or improve an important relationship. Write them a letter, send them an email, connect with them on social media or give them a call.
	C_SelfR3	Do not make excuses for your failings today. If you are late for an appointment or meeting, be honest. Admit that it's your fault. What could you do in the future to prevent this from happening?
	C_SelfR4	Set a new achievable goal and work out how you will achieve it. Write out an action plan for it and start implementing it today.
	C_SelfR5	If a situation is going badly, take some time to reflect on it and ask yourself "what went wrong and what will I do differently next time?" Make a note of the alternative actions you would take instead.
Green Dos	C_SelfR6	If you think your family/organisation or local community could do more for the environment, take responsibility. Do more yourself and encourage others to do so too. This might be encouraging your family/colleagues or neighbours to recycle more of their waste or to car share their journeys with you or getting involved with your local Transition Town group.
	C_SelfR7	Acknowledge your past, personal contribution to climate change. Think about your current carbon footprint and do something to reduce it, regardless of what other people say or do. Change one thing today to reduce your carbon footprint. What impact did this have on your day-to-day activities?

The daily Dos designed to develop dimensions of Behavioural Flexibility - Assertiveness

Assertive is insisting on your rights, or asking for what you want.		
Generic	B_Ass1	Look directly at people when talking to them today. Smile confidently, and say good morning to people on the way to work or to the shops.
	B_Ass2	Complain about something when you normally wouldn't speak up.
	B_Ass3	Say what you think on a topic. Speak up in a meeting or have an opinion on a news item.
	B_Ass4	When going out with friends, family or work colleagues, say where you would like to go and where not.
	B_Ass5	Ask for a discount when purchasing something today.
Green	B_Ass6	Take a stand on a green issue at home or work. This might be about the heating and cooling controls, or the amount of equipment that is left on stand-by.
	B_Ass7	Talk to your family/colleagues to ensure that they are doing what they can to be environmentally responsible. Keep trying even I you don't get a response immediately.

The daily Dos designed to develop dimensions of Behavioural Flexibility - Unassertiveness

Unassertive is not putting yourself forward or asking for what you want.		
Generic	B_Unass1	Instead or giving your opinion on something today, just observe and let others have a say.
	B_Unass2	Smile and nod when listening to a point you agree with rather than saying anything today.
	B_Unass3	Listen and react positively to another person's advice – even if they don't know better than you.
	B_Unass4	Let someone else choose the activity today. This might be where you go for lunch or what you will do at the weekend.
	B_Unass5	Talk at a slower pace and more quietly today.
Green	B_Unass6	Be generous in assessing other people's green initiatives. Let them explain these to you.
	B_Unass7	Take public transport or car share today and let everyone else get on board before you.

Appendix F: The Dos of the Do Something Greener Programme

The daily Dos designed to develop dimensions of Behavioural Flexibility - Conventional

Conventional is traditional, formal and according to custom.		
Generic	B_Conv1	Be polite with everyone you meet today.
	B_Conv2	Conform by going along with the consensus opinion today even if you disagree with it.
	B_Conv3	Challenge yourself to be more traditional today. Maybe take lunch at the same time as everybody else or buy a newspaper and sit down and read it.
	B_Conv4	Do things that other people often do in the evening. For example, watch the national news or listen to a popular radio show (e.g., The Archers).
	B_Conv5	Today, do something that is traditionally associated with your age and/or gender. This might be wearing a dress or makeup if you're a female or watching a sports match if you're a male.
Green	B_Conv6	Make sure you adhere to your council's local waste disposal system this week. Recycle everything that you "should".
	B_Conv7	Do something in a traditional way, like your grandparents would. This might be using leftover food to make your next meal or buying your produce at your local shops or market rather than the big chain stores.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Unconventional

Unconventional is being different and willing to stand out.		
Generic	B_Unconv1	If you want to have a go at trying something new, don't let traditions (such as gender and age) put you off. Have a go this week!
	B_Unconv2	Question why something is always done in a certain way. Don't accept as an explanation "That's the way it's always been done."
	B_Unconv3	Do something different with your usual dress – wear some distinctive jewellery or don't wear a tie depending on what would be unconventional in your circle.
	B_Unconv4	Take in some unusual or cakes to work, or put out some unusual nibbles when you have friends round.
	B_Unconv5	Suggest a themed "dressing up day" at work, to your friends in aid of charity.
Green	B_Unconv6	Test-drive an electric bike and consider the advantages of using it to get around.
	B_Unconv7	Wear a warmer but less conventional outfit today rather than, for instance, turning up the heating.

The daily Dos designed to develop dimensions of Behavioural Flexibility –Wary

Wary is being guarded, not readily trusting others.		
Generic	B_War1	Check the small print on an important document. For example, go through your bank statements and check any payments are correct, or check utility bill readings.
	B_War2	Don't share any useful ideas you have today, in case someone else steals them and takes the credit.
	B_War3	Check whom your 'friends' and 'followers' are on social media. Remove those who you don't want accessing your information.
	B_War4	Don't rely on someone else to doing something today. Follow-up and check that it's been done.
	B_War5	Read incoming emails carefully and check outgoing emails before sending them today. Send them to yourself first to get an idea of what it would be like to be on the receiving end.
Green	B_War6	Be sceptical about media reports relating to environmental scepticism. Find out and discuss what might actually be going on using this resource: www.withouthotair.com
	B_War7	Organise a meeting with your local councillor or sustainability rep at work. Question them on their sustainability policy.

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The daily Dos designed to develop dimensions of Behavioural Flexibility – Trusting

Trusting is believing others are truthful, well intentioned and reliable.		
Generic	B_Tru1	Lend a book or something else you value to a friend or work colleague.
	B_Tru2	When working with other people today, trust that they will make the right decisions for you and the group. Go along with their recommendation.
	B_Tru3	Delegate an important task that you would usually do yourself to someone else today.
	B_Tru4	Today, if you are unsure of whether someone is telling the truth, give them the benefit of the doubt. Don't question them.
	B_Tru5	Confide in someone about an important personal matter.
Green	B_Tru6	Car share or take public transport to work today. Trust that it will work well.
	B_Tru7	Place trust in someone else's green initiative, and take responsibility for putting an element of it into practice.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Unpredictable

Unpredictable is when others do not know what you will do next.		
Generic	B_Unpre1	Buy a gift for someone who would not expect it.
	B_Unpre2	Get up 1 hour earlier or go to bed 1 hour earlier/later that you usually do.
	B_Unpre3	Eat something different for breakfast, lunch or dinner. Perhaps something you haven't tried before or something you haven't had for a long time.
	B_Unpre4	Change your timing. If you're usually late for things, be early, or if you're usually early, be just on time or a little late.
	B_Unpre5	Sit somewhere different today. This could be at a different desk at work, or with someone different at lunchtime or a different place on the sofa or at the dinner table.
Green	B_Unpre6	Commute a different way today. Take a different route or a different mode of transport. Make your journey more sustainable.
	B_Unpre7	Go to a natural setting today. This could be a local park or woodland.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Predictable

Predictable is when people know what you will do next.		
Generic	B_Pre1	Watch the same TV programme or listen to the same radio station at least twice this week.
	B_Pre2	Exercise regularly and at the same time three times this week. Even if it is just for 10 minutes.
	B_Pre3	Take the same daily commute (to and from work/school), and at exactly the same time this week.
	B_Pre4	Have your breakfast/lunch or dinner at the same time and in the same place everyday this week.
	B_Pre5	Get up and go to bed at exactly the same time this week. Keep the same routine.
Green	B_Pre6	Turn lights and appliances off every time you leave a room unoccupied. Do this every day this week.
	B_Pre7	Have short showers this week. Set a timer for 5 minutes (or less) and get out when the time is up, regardless of whether you want to stay for longer.

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The daily Dos designed to develop dimensions of Behavioural Flexibility – Energetic

An energetic person is full of enthusiasm and motivated.		
Generic	B_Enrg1	Challenge yourself to see how quickly you can get through your tasks today.
	B_Enrg2	Take the stairs rather than the lift whenever you can.
	B_Enrg3	Work more briskly and efficiently. Schedule more activities in a day that you would normally consider. Set tight deadlines for yourself.
	B_Enrg4	Take up an active sport one day this week. Alternatively, walk briskly as if you're late.
	B_Enrg5	Speak briskly, but clearly, as if the person you are speaking to is late, so that conversations don't take too long.
Green	B_Enrg6	Get involved with some pro-environmental action. If you can't find anything, start it yourself.
	B_Enrg7	Initiate the replacement of all relevant light and appliances with energy-saving versions, at home/work. Don't wait for someone else to do it!

The daily Dos designed to develop dimensions of Behavioural Flexibility – Calm/relaxed

A calm and relaxed person is peaceful and not stressed; without tension.		
Generic	B_Cal1	Don't hurry today: practice walking, talking and eating slowly.
	B_Cal2	Take time to savour the moment. For example, enjoy the coffee you drink today or the fine weather, even if it might be cloudy at the weekend.
	B_Cal3	If you don't achieve everything you would have liked today, tell yourself that sometimes good enough is good enough. Revise your goals to a more realistic level.
	B_Cal4	Learn to meditate or practice yoga.
	B_Cal5	Take time to talk to people properly instead of rushing off somewhere. Respond in a calm and measured way when others are agitated.
Green	B_Cal6	One evening, turn off as many lights and appliances as possible. Enjoy the darkness and silence.
	B_Cal7	Go out to a local peaceful natural environment. This might be a quiet park, woodland, or river.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Reactive

Reactive is responding rather than initiating.		
Generic	B_Rea1	Recognise that some battles are not worth fighting, and just follow the rules. This could be filling in a form that you think is trivial or implementing a new procedure even if it doesn't seem useful to you.
	B_Rea2	If someone is tackling a task where you have more experience, don't offer to help, wait to be asked.
	B_Rea3	In a meeting, when there is an action point, don't suggest what you can do. Don't be concerned about the silence, tough it out until someone else volunteers.
	B_Rea4	Don't take the lead, listen and let someone else take charge.
	B_Rea5	If something needs to be done, and it's not urgent or important to you, wait until someone asks you to do something about it.
Green	B_Rea6	Respond positively to an environmental initiative. This might be something at work, in your community or at home.
	B_Rea7	Make sure you are personally complying with environmental policies and procedures, and are involved in their development.

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The daily Dos designed to develop dimensions of Behavioural Flexibility – Proactive

Proactive is taking the initiative, foreseeing and acting in advance.		
Generic	B_Pro1	Organise a meeting to discuss something important to you or your family.
	B_Pro2	Take the initiative and do something to repair a damaged relationship. This could be apologising to the other person, sending a card or flowers, or suggesting meeting for a coffee to talk things through.
	B_Pro3	When you see something needs doing, do it yourself or get someone else to do it, right then. Don't leave it until later.
	B_Pro4	Seek out training and development opportunities.
	B_Pro5	Decide what it is you want to achieve in your work, or your life in general. Write it down, and use this as the basis for your decision-making.
Green	B_Pro6	Look around you, see an environment-related opportunity for improvement and make it happen.
	B_Pro7	Make your own energy budget, set targets to reduce your energy use, and hit those targets.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Team orientated

Team orientated is taking a team view, or going along with the group. It's putting the needs of others first, whether they are family, friends, team members or the organisation you work for.		
Generic	B_Tea1	Volunteer to organise, or participate enthusiastically in, a team building exercise or event.
	B_Tea2	Bring some fruit, cakes or biscuits to a meeting. Volunteer to make the coffee, or wash the dishes.
	B_Tea3	Help out at a social event for the day, e.g., a charity event, school event, a local community event.
	B_Tea4	Remember that not everybody is as capable as you are. Be accommodating of others' faults and frailties and find an opportunity to support and encourage them.
	B_Tea5	Arrange to take part in a team-based sport or take up a hobby, such as amateur dramatics that will involve you cooperating with others.
Green	B_Tea6	Organise a regular meeting with other people who are interested in environmental sustainability issues. This might be people in your family, local community or in your organisation.
	B_Tea7	Raise money as a group for a carbon-saving initiative.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Individual orientated

Individual orientated refers to doing your own thing.		
Generic	B_Indv1	Make a decision without asking the group.
	B_Indv2	When someone brings you a problem, ask them what they would do to tackle it and send them off to do it.
	B_Indv3	Every day this week, do something just for yourself without feeling guilty – even if it's a long soak in the bath or meeting up with friends. Have a treat.
	B_Indv4	Identify and work towards a personal goal that is being neglected.
	B_Indv5	Be as generous to yourself as you are to others. For example, if you are always very forgiving of others, forgive yourself quickly and readily when you get something wrong this week.
Green	B_Indv6	Choose a personal green goal, just for you, and work towards it, e.g., turn your appliance off when they are not in use or use the car less and walk instead.
	B_Indv7	Reduce your personal waste, e.g., the amount you throw away, as much as possible over the course of a week.

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The daily Dos designed to develop dimensions of Behavioural Flexibility – Risk taking

Risk taking is acting without regard for the consequences.		
Generic	B_Risk1	See failure as part of learning and have a go at something you might not be good at.
	B_Risk2	Challenge an opinion made by someone in authority, even if it's just asking a question.
	B_Risk3	If you normally avoid taking centre stage, volunteer to give a presentation, or do a small part of the presentation or run a workshop, or a small part of the workshop.
	B_Risk4	Do something you have hesitated to do and don't worry what others think about what you're doing.
	B_Risk5	Consider the worst that could happen in a situation that induces some fear in you. If you can cope with the worst, take a chance and do it.
Green	B_Risk6	Take on a green challenge that you are not certain you can achieve. This might be changing your energy supplier to a sustainable provider or not using any heating or cooling devices for 1 week regardless of the temperature.
	B_Risk7	Get a weekly pass on public transport and use it for all your travel needs. Go somewhere different!

The daily Dos designed to develop dimensions of Behavioural Flexibility – Cautious

Cautious is being careful, sceptical, and concerned about risks.		
Generic	B_Cau1	Get a second opinion on any piece of important advice or fact given today.
	B_Cau2	Make sure the data on your computer is backed up. Download up-to-date software and run a virus and anti-virus spyware check.
	B_Cau3	Be "Devil's Advocate" when considering options. Write down all the potential pitfalls to get ahead of any problems.
	B_Cau4	Don't offer an opinion until you hear what everyone else thinks. Alternatively, decide to sleep on something before acting.
	B_Cau5	Shop around before buying something, or let someone else try something new before you commit.
Green	B_Cau6	Take time to question an environmental claim about a product. This might be where your energy comes from or where your bank/building society invests their capital.
	B_Cau7	Consider the risks (financial, social, political, physical) to you and your family associated with global warming. Use the internet to have a look at some of the recent reports (IPCC 5th assessment report: http://www.ipcc.ch/report/ar5/)

The daily Dos designed to develop dimensions of Behavioural Flexibility – Behaving as you wish

Behaving as you wish is doing as you want to, not as other want you to.		
Generic	B_Behw1	Be intelligently "selfish" this week. Take time out this week so that you can recharge and support others when required.
	B_Behw2	Select which deadlines you need to meet to achieve your goals and prioritise those this week.
	B_Behw3	If you have to dress a particular way for work, find some way of expressing your preferences. It could be by wearing a particular piece of jewellery or having a particular hairstyle.
	B_Behw4	Watch/listen to TV, films or music you want to, not to please others.
	B_Behw5	Don't agree with someone if you don't! For example, don't do something just to please someone else this week – only do it if you really want to.
Green	B_Behw6	If someone wants you to behave in an environmentally unfriendly way, do what you think is right by suggesting an environmentally friendly alternative that you are happier doing.
	B_Behw7	Go outside in your lunch hour as often as possible over two weeks. Have a break in a natural setting, even if there is a lot of work to do.

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The daily Dos designed to develop dimensions of Behavioural Flexibility – Behaving as expected

Behaving as expected is doing as others would normally expect you to.		
Generic	B_Behex1	Practice good manners whenever you can this week. For example, open the door for people, offer people tea or coffee, say 'Please' and 'Thank you' as often as possible.
	B_Behex2	Fulfil the requirements of your role. Meet as many deadlines as you can this week.
	B_Behex3	In a new situation, think about the expectation others might have of you and behave accordingly.
	B_Behex4	Be courteous to others. For example, let someone cut in front of you in traffic or be punctual for meetings and appointments.
	B_Behex5	Accept that we all have to do things we don't want to sometimes. Do something you'd rather not this week, and don't waste energy making a fuss.
Green	B_Behex6	Commit yourself to making sure that your company's, local council's or school's sustainability policy succeeds. Take practical action to that effect.
	B_Behex7	Be meticulous, this week, about following all waste and energy reduction policies, e.g., recycle (at work and home), switch off lights, computers etc.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Systematic

Being systematic is planning and considering in advance.		
Generic	B_Sys1	Rate your daily tasks according to whether they are urgent and/or important and tackle the important ones first.
	B_Sys2	Follow the instructions/recipe when using something or cooking something for the first time this week. Gather everything you need together before starting a task.
	B_Sys3	Systematise a task or tasks that you do on a regular basis. Use daily/weekly check lists to record progress.
	B_Sys4	Organise something in your life that's too haphazard, like sorting out your CDs, DVDs or even your finances.
	B_Sys5	Make a list of the things you want to achieve over the next week, next year and over the course of your life. Decide on how you'll do at least one of these, and identify the action steps.
Green	B_Sys6	Keep an energy diary at home/work by reading meters and setting targets.
	B_Sys7	Take an energy efficient product (e.g., lightbulb, fridge) and work out how much money it would save in energy costs over a year.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Spontaneous

Spontaneous is doing things on the spur of the moment.		
Generic	B_Spo1	Say 'yes' to something that you would normally hesitate over.
	B_Spo2	Treat yourself to something on the spur of the moment this week.
	B_Spo3	Instead of passing by your friend's/neighbour's house or your colleague's office, pop in and say 'hello'.
	B_Spo4	Do something on the spur of the moment. For example, you could call someone you haven't spoken to for a while, or book tickets for a show.
	B_Spo5	When you're fed up or bored, go and do something to cheer yourself up: call someone, book tickets for an outing, or go and have a coffee.
Green	B_Spo6	Go to a farmer's market or similar without a shopping list, and buy what looks good.
	B_Spo7	In a supermarket, buy something that you've never bought before that is in some way more environmentally friendly than your usual, e.g., less packaging, local produce, no air miles.

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The daily Dos designed to develop dimensions of Behavioural Flexibility – Open minded

Open minded is being open to new things and new experiences.		
Generic	B_Open1	Read about something that wouldn't normally interest you, politics, sport a religion maybe.
	B_Open2	Go to a restaurant serving food you haven't tried before, e.g., Iranian, vegetarian or Greek, or watch a film you would not usually choose.
	B_Open3	Put yourself in the shoes of someone you don't like, try and understand them better and think of something constructive to say to them.
	B_Open4	Think about why a firm view you have on something could be wrong and express some doubt.
	B_Open5	Listen to another person's point of view today, and don't argue! Don't dismiss new ideas as rubbish, think about an aspect of the change that has some merit and say so.
Green	B_Open6	Role play being "green" for a week. You don't have to believe, just do the best acting job you can.
	B_Open7	If you haven't already done so, watch the films "An Inconvenient Truth" and "Age of Stupid". Discuss with your family, friends or colleagues.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Single minded

Single minded is being focused, knowing what and how.		
Generic	B_Sing1	Decide to do something you have been putting off because you think others might not approve. Don't be dissuaded or put off by others.
	B_Sing2	Write a daily schedule every day this week and stick to it.
	B_Sing3	Be clear about why you think your opinion is "right" and defend it consistently.
	B_Sing4	Don't go along with change for the sake of it. Think about the opportunities for you and do something to make the most of those.
	B_Sing5	When you feel you are making slow progress with something, be persistent. Don't give up; just keep doing something every day that will move you further towards your goal. Start today. Progress is often two steps forward, one step backwards.
Green	B_Sing6	Plan a week's low carbon journeys and stick your plan (whatever the weather).
	B_Sing7	Write down a plan for a significant reduction in your personal carbon emissions and single-mindedly achieve your target.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Extroverted

Extroverted is outgoing and sociable.		
Generic	B_Extr1	Be curious about people this week, and show your interest by asking questions. Make the first move to introduce yourself to a group.
	B_Extr2	Be upbeat, smile and say good morning to people today. Say hello to everyone you meet today.
	B_Extr3	Make a list of all the groups you belong to, work and non-work. Challenge yourself to add another group to each list.
	B_Extr4	Ask people how they are when you meet them, and show interest in their responses.
	B_Extr5	Join a club or do an activity you are interested in – remember everyone is the new person at some time.
Green	B_Extr6	Attend a pro-environmental meeting this week (e.g., Transition Town meeting), introduce yourself to some new people there, and discuss your views.
	B_Extr7	Start an environmental group at work, in your neighbourhood, and meet once this week.

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The daily Dos designed to develop dimensions of Behavioural Flexibility – Introverted

Introverted is inward looking and thoughtful.		
Generic	B_Intr1	Instead or discussing issues with others, take time to reflect along. Fade into the background as much as possible this week.
	B_Intr2	Speak quietly and slowly as much as possible today. Speak less and, listen to others more.
	B_Intr3	Spend some time alone and think about why you might enjoy your own company.
	B_Intr4	Spend some time people watching, and spotting introverts. Consider if there are some advantages in behaving like them.
	B_Intr5	In a situation where you would normally contribute a great deal, don't speak until you are asked a question.
Green	B_Intr6	Spend some time alone, collecting your thoughts (and some facts) about climate change.
	B_Intr7	Change something about your environmental behaviour without telling anyone. Sustain the change and add to it over time.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Definite

Definite is being certain and sure.		
Generic	B_Def1	Stand up for yourself, and see the benefits of taking a firm line when challenged this week.
	B_Def2	Speak out when you disagree with what someone is saying or doing this week.
	B_Def3	When stating a point, make eye contact with the person you are addressing and make your point as if you are assuming agreement. Be clear and consistent.
	B_Def4	Don't be influenced by the emotion you feel today. Focus on your long-terms goals to help you stick to your preferred course of action.
	B_Def5	Don't allow yourself to be blown off course by counter arguments this week. Listen, but if you've done your homework by considering other options then stick to your guns.
Green	B_Def6	Find out how much energy and whether it is high compared with other users.
	B_Def7	Find out about the scientific consensus on climate change and tell someone else about it.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Flexible

Flexible is open to change, willing and able to adapt.		
Generic	B_Flex1	Look at what others do differently in a similar role to you. Adopt something that they do that would work for you.
	B_Flex2	Cooperate with the inevitable. If you are facing change, not matter how large or small, write down all the new possibilities you can think of that could emerge from the new situation.
	B_Flex3	Avoid wasting time and energy defending your opinions, as if your opinion is the only valid point of view. Assume other people see things differently for a reason. This week, try to discover what they see, that you don't.
	B_Flex4	Let others be 'right' today. Be humble, don't criticise. As long as it's not reckless, go along with their wishes. If they are right you'll have learned something.
	B_Flex5	When you have a difference of opinion with someone this week, think about things from the other person's point view, and do something that shows your willingness to compromise.
Green	B_Flex6	Change your energy supplier to a 'green' tariff (e.g. Good Energy). If it cost a bit more, then use a bit less.
	B_Flex7	Embrace an aspect of your company's or local council's sustainability policy, make sure you adapt to it and encourage others to do so.

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The daily Dos designed to develop dimensions of Behavioural Flexibility – Gentle

Gentle is mild, kindly and subtle.		
Generic	B_Gen1	Buy someone flowers, or send a card to say thank you for something someone has done for you.
	B_Gen2	Help someone out without being asked. Lend a hand when you see someone is struggling this week.
	B_Gen3	When someone is looking concerned, anxious or unhappy, ask if they are all right.
	B_Gen4	Be thoughtful towards someone. If someone is on their own, chat to them or include them in your group's conversation.
	B_Gen5	Be approachable today. Take into account your facial expression and body language might communicate to others. Be supportive and encouraging of someone who is trying their best.
Green	B_Gen6	Offer support to a person who is trying to implement a pro-environmental change.
	B_Gen7	Talk to some children (e.g., your own, members of the family or a school group) about responsibility for the environment.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Firm

Firm is resolute, standing by what you think; determined.		
Generic	B_Firm1	Don't feel you have to justify everything you do this week. Just state what you intend to do, and why, but don't over explain.
	B_Firm2	Recognise that you can never please everyone all of the time and don't waste time trying. Set a limit on the time you will allow for discussion and then make a decision.
	B_Firm3	Make a strategic decision and stick with it. Don't be swayed by the immediate circumstances you are in.
	B_Firm4	Take a stand. This could be defending your opinion to work colleagues, friends or family.
	B_Firm5	Speak out if you disagree with what someone else is doing this week.
Green	B_Firm6	Adopt a new pro-environmental behaviour and persist until it is achieved.
	B_Firm7	Tell one of your energy suppliers that you will be taking environmental performance into account. Find out about the options that are available to switch to a 'greener' tariff.

The daily Dos designed to develop dimensions of Behavioural Flexibility – Not lively

Not lively is still and laid-back.		
Generic	B_Notliv1	Spend 5 minutes at the end of each day reflecting on the day's events and planning tomorrow's. Do this everyday this week.
	B_Notliv2	Sit still for twenty minutes today. Notice the sounds around you or learn to meditate.
	B_Notliv3	Instead of going out, have a quiet evening it. Don't necessarily watch TV, listen to some music or read a book.
	B_Notliv4	Go out for a coffee on your own. Quietly observe other people an the way in which they behave.
	B_Notliv5	Don't be the first to volunteer for things this week, create some space to encourage others to step up to the bar.
Green	B_Notliv6	If you drive, plan your next three journeys without using the car.
	B_Notliv7	Spend the week doing things more slowly. Take a slow journey (e.g., by walking or cycling) or cook a meal slowly. Enjoy the process rather than just the results.

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The daily Dos designed to develop dimensions of Behavioural Flexibility – Lively

Lively is being bubbly, effusive, full of life and animated.		
Generic	B_Liv1	Walk briskly, as if you're excited to get somewhere. Stride along corridors and up stairs today.
	B_Liv2	At home, dance to or sing along with your favourite tune as you do chores.
	B_Liv3	Challenge yourself to see how quickly you can get through your tasks today.
	B_Liv4	Multi-task. Make a call while you are cooking dinner or read a report while you are waiting for an appointment etc.
	B_Liv5	Pretend you have to get your message across to someone who can only give you a few minutes of their time.
Green	B_Liv6	Organise a social event to publicise environmental sustainability.
	B_Liv7	Organise and/or do a sponsored walk, run or bike ride for a pro-environmental cause.

Appendix G: Do Something Greener Feedback Report

Personal Feedback Report

Personal FITness and Pro-environmental Activity

Introduction

This report is designed to help you understand your levels of personal FITness and pro-environmental activity. It will help you to identify the areas that could be developed further as part of the Do Something Greener programme.

This report is divided into two sections. First, there is some background information on the FIT Framework and pro-environmental activity. Second, you will find a graphical presentation of your FIT characteristics and levels of pro-environmental activity.

The FIT Framework

FIT is an acronym for the Framework for Internal Transformation. It is a model of behaviour with an associated framework of behaviour change. FIT is a model that considers the potential impact of cognitive and behavioural habits on people's everyday decisions and behaviours. It does this by measuring people's cognitive and behavioural strengths using a psychometrically validated tool called the FIT Profiler. This is the survey that you have just completed. The FIT Framework also includes a variety of behavioural interventions, called Do Something Different, that encourage and support people to develop their existing cognitive and behavioural strengths.

FIT theory acknowledges that behaviour and thinking-style can both be prone to inflexibility and habit, and this might prevent effectiveness in different areas of life. FIT suggests that this kind of automatic behaviour can often control how we behave and as a consequence might place enormous limits on the way we approach different aspects of our life. The FIT Framework and Do Something Different programme encourage people to break out of these routine patterns of thinking and behaving by developing their cognitive characteristics and degree of flexibility in behaviour. The Dos provided as part of this programme will help you to challenge your existing habits and become more flexible in your approach. However, before starting the programme it is important for you to understand your current ways of thinking and behaving.

The FIT Profiler psychometric that you have completed provides information on the way you currently think and behave across the FIT dimensions. Before providing your personal results, it is useful to provide a brief explanation of the different dimensions of FIT – the Cognitive Constancies and Behavioural Flexibility.

Cognitive Constancies

According to the FIT Framework, the Cognitive Constancies underpin action. When they are of sufficient strength and aligned at similar levels, they can help to guide decision-making and behaviour that is effective and in line with your personalised goals. There are 5 different Cognitive Constancies. These are:

1. *Awareness* is the degree to which an individual monitors and attends to their internal and external worlds. It is the extent to which an individual is awake to their environments and the learning possibilities that these offer.

2. *Balance* is the ability of people to ensure every aspect of life receives due care and attention so that each part is in sync and no one part dominates. A person who scores high on balance is able to prioritise different aspects of their life and allocate cognitive and behavioural resources towards these in accordance with demand.

3. *Conscience/ethics* is the moral compass for decision-making and behaviour. It allows people to differentiate right from wrong and then act on doing the right thing. An individual with a high level of Conscience with endeavour to make every decision an ethically and morally correct one.

4. *Fearlessness* is acting without fear or trepidation and facing unknown situations with the same confidence and bravado as those that are known. High levels of fear can be an emotional limiter of behaviour that keeps people within their comfort zones, doing the things that they have always done.

5. *Self-responsibility* is the extent to which an individual takes charge of their life and accepts responsibility for their actions and the things that happen to them, regardless of factors outside of their control. An individual who is self-responsible takes an active role in shaping their world so that it suits them.

Higher levels of each Constancy and a general alignment across the Constancies helps with effective decision-making.

Appendix G: Do Something Greener Feedback Report

Behavioural Flexibility

Having a sufficient level of Behavioural Flexibility enables an individual to behave effectively and flexibly across a range of different situations. This will help to ensure that an individual's behaviour is appropriate to the situation. The FIT Framework measures flexibility across 15 bi-dimensional behaviours. These are:

Pole 1		**Pole 2**
Assertive	V	Unassertive
Conventional	V	Unconventional
Cautious	V	Trusting
Predictable	V	Unpredictable
Energetic/Driven	V	Calm/Relaxed
Reactive	V	Proactive
Group orientated	V	Individually orientated
Risk taker	V	Cautious
Behave as I wish	V	Behave as others expect
Systematic	V	Spontaneous
Open-minded	V	Single-minded
Extroverted	V	Introverted
Definite	V	Flexible
Lively	V	Not lively
Gentle	V	Firm

Most people tend to have a 'comfort zone' on each behaviour dimension, which reflects personal preferences in the way they behave – their habits.

The purpose of the Do Something Different programme is to extend an individual's behavioural comfort zone to help them be better equipped to behave appropriately and flexibly in accordance with circumstance, and as guided by their Cognitive Constancies.

Pro-environmental activity

There is now very little doubt regarding the connection between human behaviour, carbon emissions and changes to the world's climate. A recent report compiled by an international consortium of scientists, the largest of its kind to date, has suggested that the large majority of climate researchers agree that human activity is contributing to global warming (Intergovernmental Panel on Climate Change Assessment Report 5 [IPCC AR5], 2013). There is a significant relationship between changes to the climate and human behaviour, as reflected in individual lifestyle preferences and organisational practices.

Despite the increasing scientific evidence, it seems that a large majority of people still remain either unaware, in denial, or otherwise disengaged from the problem of climate change and do not consider the environmental impact of their everyday behaviours. It seems that for most individuals, daily life continues in a way that is environmentally unsustainable. This situation is untenable in the long-term. There is a need for people to consider the environmental impact of their lifestyles and make changes to mitigate this impact.

Appendix G: Do Something Greener Feedback Report

The pro-environmental activity scales that you completed give an indication of your levels of pro-environmental activity in your thinking and behaviour in home and work contexts. The scales measure the importance you attribute to a range of different pro-environmental behaviours and assess how frequently you perform each of these behaviours in home and work contexts. The content similarity across the scales enables your scores to be compared across the scales so that you can identify the area(s) where you might be performing well as well as the area(s) that you might need to develop.

Higher scores on each of the scales indicates better performance. The purpose of the Do Something Different programme is to extend your engagement with pro-environmental activity both cognitively and behaviourally.

Your Personal Feedback Report

Below is your personal feedback report. This shows your scores on Behavioural Flexibility and the Cognitive Constancies based on the answers you provided to the FIT Profiler psychometric and also your current levels of pro-environmental activity. The graphs display your FIT and pro-environmental activity levels in comparison to the maximum possible scores.

FIT Scores

The maximum Behavioural Flexibility score is 100.

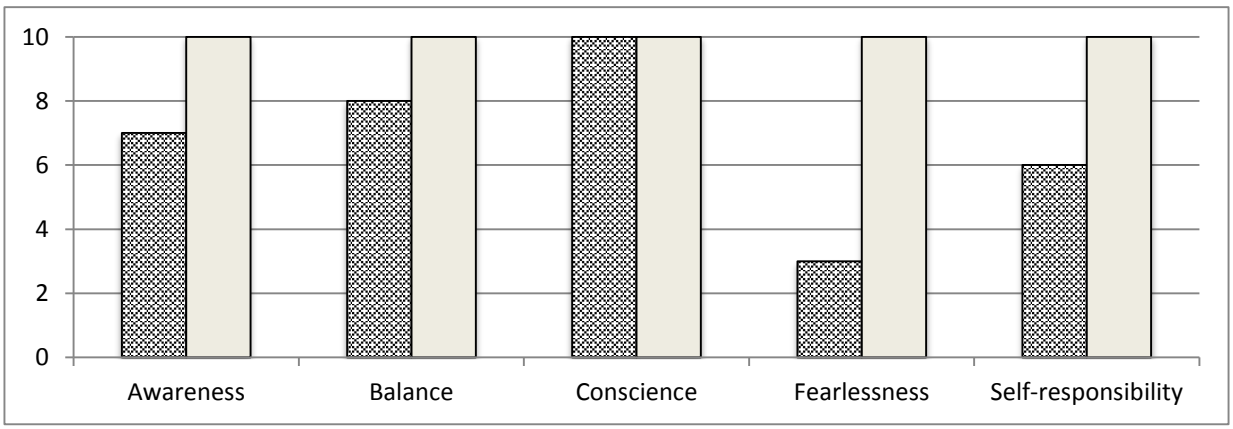
The maximum score on each of the Cognitive Constancies is 10.

If any of your scores are particularly low, you should prioritise seeking development in these areas by choosing appropriate Dos from the Do Something Different programme.

If you have any large discrepancies across your Cognitive Constancy scores you should also prioritise developing the areas that are lower in order to increase alignment.

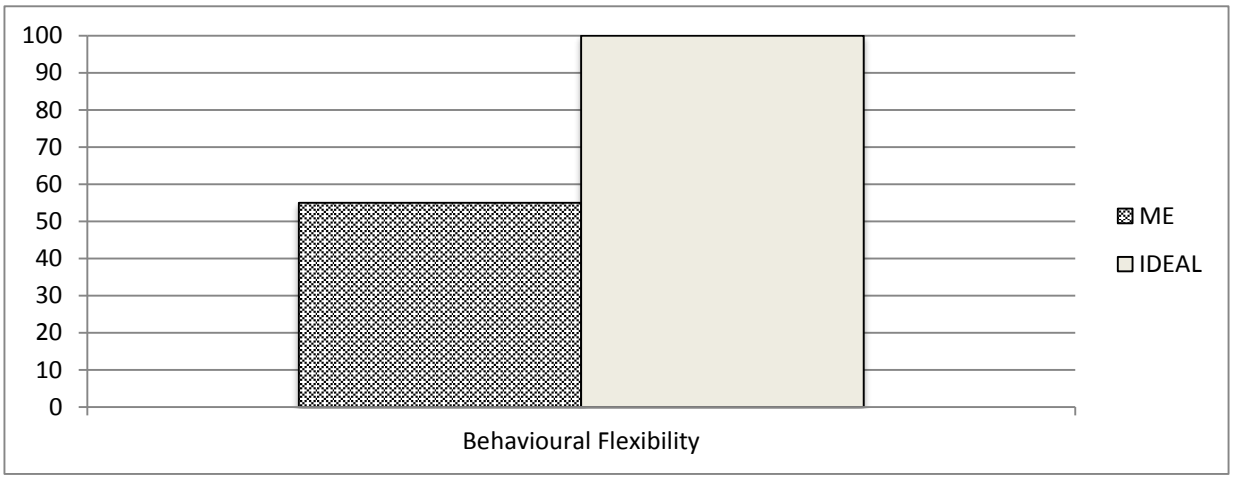
The Do Something Different programme encourages development across all areas of FIT. These feedback scores give you further insight into the areas that you might need to give further attention.

Cognitive Constancies



Appendix G: Do Something Greener Feedback Report

Behavioural Flexibility



Pro-environmental Activity Scores

The maximum scores on each of the pro-environmental activity scales are 100.

If any of your scores are particularly low, you should prioritise seeking development in these areas by choosing appropriate Dos from the Do Something Greener programme.

If you have any large discrepancies across your scores you should also prioritise developing the areas that are lower in order to increase alignment.

The Do Something Different programme encourages development across all areas of pro-environmental activity. These feedback scores give you further insight into the areas that you might need to give further attention.

Pro-environmental activity