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2020

Leaving No Trace in the Irish Countryside: Effecting Behavioural Change of Recreationists

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Recommended Citation

LEAVING NO TRACE IN THE IRISH COUNTRYSIDE: EFFECTING BEHAVIOURAL CHANGE OF RECREATIONISTS

A Thesis Submitted in Fulfilment of a PhD
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Submitted to the Quality and Qualifications Ireland (QQI)

May 2020

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Abstract

The Irish countryside has become a hotspot for outdoor recreation and activity tourism. Despite the many positive impacts of these activities, adverse impacts on wildlife, the environment and farming practices are an unfortunate consequence of irresponsible behaviour. Although not all negative impacts can be mitigated by behaving responsibly, user education has been identified as crucial to reducing negative impacts and ensuring the environmental, and hence the economic, sustainability of both activity tourism and recreation. The development of effective programmes aimed at behavioural change requires a thorough investigation of the target audience and how they interact with the natural environment.

This study addresses the current dearth of research regarding the attitudes and behaviours of outdoor recreationists and activity tourists in Ireland towards the natural environment. It aims to investigate how behavioural change has been achieved in a range of parallel contexts and identify the combination of factors necessary to effect positive change.

This PhD research is a combination of four sequential methodological stages. A quantitative survey of recreationists was conducted first, followed by two rounds of semi-structured interviews with experts in outdoor recreation, tourism and behavioural change. The culmination of the data analysis enabled the researcher to design a theoretical framework for behavioural change. Aspects of this framework have been applied and tested in a pilot intervention in the form of a workshop.

The findings of this research suggest that attitude is an essential aspect of behavioural intention, however previously understated factors such as place attachment, knowledge, social identity and trust are important factors in the design of behavioural interventions. There is evidence to support the use of theory in behavioural change, yet caution is needed on its application and evaluation. Effective communication, active learning and post-testing are effective tools in the implementation and evaluation of interventions. The researcher has developed a framework illustrating the factors necessary to achieve behavioural change in the context of outdoor recreation. The theoretical framework will aid in the design of future interventions aiming to induce long-term behavioural change. The research outcomes will contribute significantly to the development of effective policy and educational strategies influencing behavioural change and thus contribute to the protection of our natural environment for future generations.

Dedication

To my parents, Ger and Sheila Doyle, without their never-ending support I wouldn't be where I am. Nan Nan, the bestist, the nicest and the loveliest. Grandad, who taught me to remain calm and work through obstacles. Larkin who taught me that complicated things can be broken down into simple processes "swing swing". Nanny, and all her home-baked cakes and bread.

Acknowledgements

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List of Acronyms

ATTA	Adventure Travel Trade Association
BCE	Experts in the field of Behavioural Change
CSO	Central Statistics Office
EPA	Environmental Protection Agency
ERB	Environmentally Responsible Behaviour
GNP	Gross National Product
LNT	Leave No Trace
MMR	Mixed Methods Research
N.O.L.S	National Outdoor Leadership School
NGO	Non-Governmental Organisation

SAC	Special Areas of Conservation
SCT	Social Cogitative Theory
SPA	Special Protection Areas
TPB	Theory of Planned Behaviour
TRE	Expert in the Field of Outdoor Recreation and Activity Tourism
TTM	Transtheoretical Model of Change
UK	The United Kingdom of Great Britain and Northern Ireland
UNWTO	United Nations World Tourism Association
US	United States of America
USDA	United States Department of Agriculture

Chapter 1: Introduction

This chapter examines the rationale and significance of this research. The aims of the research are outlined, and the context of this research is discussed. This chapter also discusses where the research is situated in the literature and how it should be interpreted. Finally, the thesis structure is presented to provide clarity for the reader.

1.1 Rationale

Four principal themes combine to explain the rationale of this research.
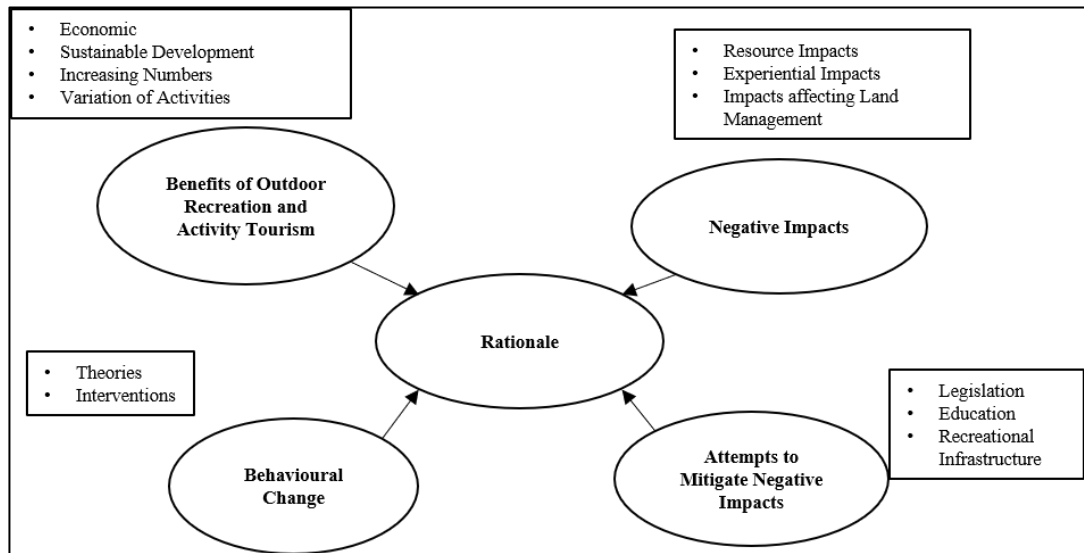
Figure 1.1 Rationale of the proposed research

Figure 1.1 illustrates the themes which encapsulate the rationale of this research. The rationale of this research lies in the importance of outdoor recreation and activity tourism, the negative impacts that can threaten the sustainability of these sectors and the attempts to mitigate these negative impacts. In addition, demonstrating how theories of behavioural change can be incorporated into the design of behavioural interventions is a primary rationale of this research.

1.1.1 Outdoor Recreation and Activity Tourism

This research is rooted in the context of outdoor recreation, specifically outdoor recreation in Ireland. According to Bell, et al. (2007, p.6), "Outdoor recreation refers to activities that people undertake out of doors in places where they can access nature or green areas". For the purposes of this thesis, Bell, et al's interpretation of outdoor recreation should be assumed. Included in the ambit of outdoor recreation is activity tourism. Determining what constitutes activity tourism can be complex and subjective (Swarbrooke et al., 2003; Adventure Travel Trade Association, 2018). A vacation can be described as activity tourism if it comprises of a combination of physical activity, cultural exchange and interaction with the environment. It is crucial to define these terms early in the thesis for the convenience of the reader and to reduce the possibility of ambiguity. An activity tourist will most likely engage with outdoor recreation, but not all outdoor recreationists are activity tourists. This should be assumed throughout the remainder of the thesis.

Tourism in Ireland has seen a remarkable rise in recent years, particularly in the last decade (Fáilte Ireland, 2019). According to a report by Fáilte Ireland (2019), in 2018, Ireland was visited by over 10.9 million holidaymakers from outside of the state. This indicates the importance of tourism to this research. It is impossible to conduct a study on outdoor recreation without considering the potentially huge numbers of activity tourists who can also engage in outdoor recreation.

It is crucial to frame what outdoor recreation means for this research. Working from the earlier definition and using the recreational plan produced by Coillte (which is a state-owned forestry business in Ireland) helps to mitigate the traditional view of outdoor recreation as a high-octane, thrill-seeking activity (Coillte, 2017). The

Adventure Travel Trade Association (2013) estimated that nearly 90% of outdoor recreation is represented by what is known as "soft" activities. These soft activities can include walking, camping, swimming, fishing, bird watching and cycling. High octane activities such as mountain biking, mountain climbing, and surfing are also included in outdoor recreation. This variety of possible outdoor recreational activities makes Ireland especially suitable for activity tourism as it has an abundance of natural resources to accommodate these outdoor recreations. The inclusiveness of outdoor recreation means that a substantial proportion of the population can be described as outdoor recreationists of some sort, even without their knowledge.

Benefits

The use of nature in both urban green spaces and rural areas for outdoor recreation and activity tourism has been linked with a multitude of benefits for people. These can be seen in terms of health (Schoffman et al., 2015), as well as the economy and societal wellbeing (Gratton and Kokolakakis, 2013). These benefits will be discussed further in the literature review chapter. However, it is important to briefly discuss these benefits as they illustrate the need for and significance of this research.

Tourism can result in numerous economic benefits. For example, 2018 was an excellent year for Irish tourism, with the total tourism expenditure estimated to be €9.4 billion (Fáilte Ireland, 2019). The report by Fáilte Ireland also states that over 25% of tourists engaged in walking/hiking during their stay, with a number of other outdoor recreational activities also being mentioned (Fáilte Ireland, 2019). Finally, sites in which outdoor recreation takes place were prevalent in both the top free and paid attraction categories of the report by Fáilte Ireland (Muckross House, Kilkenny Parklands, National Botanical Gardens, etc.). Participation in outdoor recreation can

increase the awareness and appreciation for the natural environment (Ewert, Place and Sibthorp, 2004; Berns and Simpson, 2009). In addition, studies have investigated the value of recreational land use as opposed to traditional agriculture (Hynes, Buckley and van Rensburg, 2006; Buckley, van Rensburg and Hynes, 2009) in rural areas. Furthermore, new sources of income may act as an incentive for landowners to adopt multiple land-use approaches instead of intensive agriculture in order to protect the environment. The popularity of these beautiful recreational areas supports the need for this research as the sustainable development of these areas will be paramount to their continued attractiveness as destinations.

The health benefits of engagement in outdoor recreation are well known. Researchers have linked participation in outdoor recreation to aiding in the treatment of mental health problems such as depression, stress and insomnia (Jenkins and Pigram, 2005; Bell et al., 2007; Mann and Leahy, 2010). There is also a positive financial impact to be gained for the government, as participation in outdoor recreation has been suggested as a treatment for several physical and mental health issues. This can reduce the number of patients requiring medical or psychiatric treatment in hospitals, thus saving the government money. The use of a social prescriber and the promotion outdoor activities is becoming a popular tool for doctors in the United Kingdom, as described by a recent article in the Irish Times (Harrold, 2019). A recent article published in the Irish Independent, claims that Doctors are reducing waiting room times by prescribing social activities (O'Connor, 2020). This scheme has been conducted in 17 locations across Ireland, particularly in Co Mayo and Co Donegal. Patients who present to a GP with mental or physical complaints can be then referred to a social prescriber who assesses the case and aids the patient by setting them up with local services and groups. The initiative is viewed as largely successful with

some doctors reporting a 25% drop in consultations with patients who have engaged with a social prescriber (O'Connor, 2020).

Negative Impacts

Despite the benefits of outdoor recreation and activity tourism, the overuse, as well as the irresponsible use of the outdoors can have many negative impacts. This is echoed by Leung and Marion (2000, p.23) who stated: "Negative impacts on wilderness are an inevitable consequence of recreation". Studies conducted regarding the negative impacts of outdoor recreation on the environment have allowed for the development of a new field of research known as recreation ecology (Marion, 2006). The negative impacts of outdoor recreation are discussed in greater detail in Chapter 2. However, some negative impacts will be discussed briefly here in order to elucidate the need for this research. The natural environment is regarded as a resource in the context of outdoor recreation and activity tourism, and therefore it will be referred to as such in this thesis (Newman et al., 2003; Manning, 2007; Kaiser, 2008; Marion et al., 2016).

The impacts associated with irresponsible outdoor recreation have been described by Manning and Anderson (2012) as fitting into three broad categories. These are:

- resource impacts such as damage to soils and water quality as well as habitat disturbance and biodiversity loss
- experiential impacts such as crowding and land use conflict
- management impacts such as trail degradation.

These negative impacts highlight the significance of this research as a large number of areas in which recreation takes place are Special Areas of Conservation or Special Protection Areas, which means that these areas are designated for the conservation

of protected species of plants and animals (Stokes, O'Neill and McDonald, 2004; van Rensburg, Doherty and Murray, 2006; The National Trails Office, 2012). Unfortunately, outdoor recreation occurs in some of the most fragile ecosystems such as bogs and sand dunes (Pigram and Jenkins, 2005; The National Trails Office, 2012; The Border Midland Western Regional Assembly, 2014). For example, the trampling of soils in protected areas can have a significant negative impact. Trampling can significantly affect soils, which can show reduced microbial diversity, vegetation and species composition (Randall and Newsome, 2009; Oprządek, 2014). In addition, the biodiversity in areas can be altered significantly as some species of plant are more resilient to trampling than others (Anderson, 1995; Roovers et al., 2004; Pescott and Stewart, 2014).

One of the most prominent experiential impacts can be overcrowding. The effects of crowding have caused many park management officials to investigate the "carrying capacity" of the resource area (Watson, Williams and Daigle, 1991; Manning, 2007). Unfortunately, the concept of crowding is subjective to the individual, and it varies between the type of person, the culture and the kind of environment.

These negative impacts are only a sample of the possible effects of irresponsible behaviours in the outdoors. The numerous types of negative impacts justify the need for this research as the continued growth of outdoor recreation and activity tourism could have disastrous effects if these impacts are not investigated and mitigated.

There is a dearth of literature regarding the general usage numbers and behaviours of outdoor recreationists from an Irish perspective. The potential impacts of irresponsible outdoor recreation are not currently fully understood, in addition, the

lack of knowledge of the usage numbers of people participating in outdoor recreation could hinder the design and implementation of sustainable tourism and recreation strategies. This is of particular interest to Ireland as the Adventure Travel Trade Association identified Ireland as an ideal destination for the development of activity or adventure tourism. The Adventure Travel Trade Association highlighted the available resources and economic freedom in Ireland (Adventure Travel Trade Association, 2018). In addition, Fáilte Ireland has consistently reported the growing popularity in recreation and the importance of the development of this sector for the future (Tourism Ireland, 2013; Fáilte Ireland, 2014).

1.1.2 Attempts to Mitigate Negative Impacts

There have been numerous attempts to mitigate the negative impacts caused by outdoor recreation in a variety of contexts. Looking at the United States, where a significant body of research is conducted regarding outdoor recreation, the number of visitors to national parks in 2014 was over 292 million people (U.S. National Park Service, 2019). The United States is a useful example to demonstrate the rapid growth in outdoor recreation as well as the need to reduce the negative impacts on the environment. The impacts, both positive and negative, associated with outdoor recreation, have been mentioned briefly. The growth in visitor numbers and participation has led to significant research on carrying capacity, with many recreation ecologists believing that the current growth of outdoor recreation is unsustainable (Cole, 1989; Manning, 2007; Hammit, Cole and Monz, 2015). There exists a number of strategies that are used by management officials to curb irresponsible behaviour by outdoor recreationists. They will be introduced here in order to frame the rationale for this research.

Legislation

The use of legislation by management officials can be seen under two main categories, namely, the use of regulation and the use of economic incentives. While there are a number of benefits for a direct approach to behaviour change in outdoor recreation, many studies attest that direct management is not effective at changing behaviour in the long-term (Cole, 1989; Manning, 2007; Steg, Van Den Berg and De Groot, 2013). A point worth noting is that several irresponsible recreational behaviours are already punishable by law in Ireland and indeed many countries. For example, under current legislation in Ireland, such as the Litter Pollution Act 1997, which was amended by both the Waste Management (Amendment) Act 2001 and the Protection of the Environment Act 2003, the leaving or discarding of litter in public places is an offence that is punishable by an on-the-spot fine of €150 or a maximum fine of €3,000 following a conviction in the district court (Chapter 2 discusses these themes in more detail). This aids the justification for this research as current legislation does not seem to induce compliance with recommended behavioural practices regarding outdoor recreation, as evidenced by the ongoing issue of illegal dumping. This research is uniquely situated to examine possibilities as to why that is.

Education

The use of education as a means to mitigate irresponsible recreational behaviours will be a core theme of this research. A brief introduction will be presented here in order to frame the need for this research. The creation and dissemination of environmental methods and education has risen in popularity as a tool in recreational ecology and environmental psychology (Manning, 2007; Madden, 2009). The general concept is that the provision of education on the most appropriate behaviours

will increase compliance and induce behavioural change (Christensen and Cole, 2000; Jensen, 2002; Marion and Reid, 2007).

The relatively low cost of educational interventions (when compared to regulation) in addition to the unobtrusive nature of educational messages might not impede on the recreational experience of people (Jones and Bruyere, 2004; Bell, 2005). Additionally, a number of scholars have suggested that many of the irresponsible actions caused by recreationists are due to uninformed, unskilled and careless actions (Ellis, 2005; Kaiser, 2008; Widman, 2010). This research is ideally suited to investigate the use of education in the context of outdoor recreationists in Ireland.

Recreational Infrastructure

Sustainable development is described in the often-cited Brundtland report (1987, p.41) as "development that meets the needs of the present without compromising the ability of future generations to meet their needs". The continued growth of outdoor recreation and tourism will need investment in order to adequately meet the growing demand. The Outdoor Recreation Plan developed by Coillte identified the development of infrastructure as a critical component for the sustainable development of outdoor recreation (Coillte, 2017). Examples of developments suggested by the plan include the development of trailheads, signage and car parks. For example, the development of car parks can mitigate congestion and overcrowding at recreational access points.

1.1.3 Behavioural Change

Behavioural prediction and change theory have been a topic of considerable debate across numerous disciplines for decades (Webb and Sheeran, 2006; Kurz et al., 2015;

Dolan and Galizzi, 2015). Several theories pertain to behavioural change in a range of contexts, notably, the theory of planned behaviour (Ajzen, 1991), social cognitive theory (Bandura, 1999) and the transtheoretical model of behavioural change (Prochaska and DiClemente, 1982; Prochaska, DiClemente and Norcross, 1993) and have all been used in many interventions. However, the application and validity of each theory have been criticised; this debate has spanned decades of research and will continue for decades to come. One of the purposes of this research is to examine the application of behavioural change theory in the context of outdoor recreation in Ireland.

The study of behaviour serves as a primary foundation of this research. The concept of behaviour is discussed in more detail in Chapter 2. However, this section will serve as a brief introduction to the importance of behaviour and as a justification for the study of behaviour in the context of outdoor recreation. There is a growing consensus among social science researchers that human behaviour accounts for both the cause and possible solution to many of the social issues that affect modern society (for example, racism, health, discrimination, environment degradation and industry productivity) (Ajzen and Albarracin, 2007; Fishbein and Ajzen, 2010).

A large amount of behavioural research stems from health science, and behavioural change in health science often aims to increase or reduce certain behaviours (for example, smoking, drinking, and weight reduction). Although there are a number of studies into behavioural change from other countries, much of the literature on behavioural change in outdoor recreation and the efficacy of educational strategies comes from the United States. There is no notable research on the attitudes and behaviours of outdoor recreationists in an Irish context as well as a paucity of

empirically supported interventions for the sustainable development of outdoor recreation. As a result, the by-proxy use of land management and educational strategies from other countries may not be as effective depending on the culture of the target population (Kindermann and Gormally, 2013; Eshun and Tonto, 2014).

Irish Specific Research

When discussing the attitudes and behaviours of recreationists in Ireland, there are a few studies, while not in this specific area, that can be of use for comparison nevertheless. For example, Motherway, et al., conducted a significant investigation of environmental attitudes in Ireland across demographics (Motherway et al., 2003). The research used a national survey of environmental attitudes to develop a study on environmental attitudes, values and behaviour designed by the International Social Survey Programme (ISSP). The data produced by this study served as the basis for several follow up reports. One such study involved the investigation of environmental attitudes in Ireland across demographics conducted by Motherway, et al. (2003). The report indicated that there was evidence to suggest that environmentalism was becoming more mainstream. The study examined the environmental attitudes over a broad range of contexts and demographics. Unfortunately, more recent retests have not been carried out, which could have led to some interesting comparisons on the shift of attitudinal thinking over a more extended period. The concept of trust was a notable aspect of the study conducted by Kelly, et al. (2003) The low levels of trust shown to publications made by businesses and government departments on the causes of pollution is a notable finding (Kelly et al., 2003). A contradiction noted by Kelly, et al., is that while government officials are not trusted, when faced with the theme of environmental concern, respondents were strongly supportive of government-led responses through regulation and even

through higher prices or taxes where necessary (Kelly et al., 2003). While this is an encouraging finding, research is needed to see if the pro-environmental attitude and support for government initiatives are found in outdoor recreationists as regulation and paternalism could dampen the enjoyment of recreationists who travel to the outdoors to unwind (Leung and Marion, 2000; Manning and Anderson, 2012; Skår and Vistad, 2013).

A more recent study on Irish, pro-environmental behaviours was conducted by Lavelle, Rau and Fahy (2015). This research examined the concept of pro-environmental behaviours with the idea of disaggregating these behaviours in the context of time, these groups are described as habitual and occasional behaviours (Lavelle, Rau and Fahy, 2015). The habitual behaviours occur most frequently, such as bringing a reusable coffee cup every day, whereas an occasional behaviour could be buying an electric car. This paper suggests that environmental behaviours should not be categorised collectively, the factors that influence behavioural intention on habitual behaviours were different from those that affected occasional behaviours, which highlights the opportunity of using different approaches to address separate behavioural issues. The study by Lavelle, Rau and Fahy emphasises the need for this research. Without knowledge of the determinants of behaviour, or the factors that may influence behavioural intention in outdoor recreationists, how can sustainable development be conducted effectively?

Behavioural Theories

Attempting to examine and explain behaviour is not a new concept to social science. A range of theories and frameworks have been developed, and scholars have debated their merits for decades (Bandura, 1999; Smith and Hitt, 2005). Behaviour is defined

as how a person behaves in response to a situation or stimulus. How and why people act the way they do has been the focus of many studies across numerous disciplines (Morris, 2007; Smith et al., 2008; Davis et al., 2015). Previous research on recreation ecology examined the use of behaviour theory in the design of interventions to increase compliance with environmentally responsible behaviours. While a number of behavioural theories have been used before, no single theory has been proven to be the most effective in this regard. This demonstrates the need for this research, as one of the core rationales of this research is to examine the use of behavioural theory in regard to outdoor recreation in Ireland.

In addition, Chapter 2 presents the argument that many of the theory-based interventions seem to lack a robust application of theory. This argument has been made by several critics who claim that some interventions only pay lip service to behavioural change theories in order to increase their pedigree (Michie, van Stralen and West, 2011; Prestwich et al., 2014).

This research will contribute to the knowledge base in Ireland regarding the determinants of the behavioural intention of outdoor recreationists in relation to the environment and the practising of environmentally responsible behaviours. The application of established behavioural theories with regard to outdoor recreation will be evaluated. At present, the application of these behavioural theories in outdoor recreational behavioural change may not be fit for purpose or in fact, exist at all. This research will identify the most important concepts described by the behavioural theories while examining the factors required to develop behavioural interventions in the context of outdoor recreation. In addition, the efficacy of behavioural interventions across a number of comparable disciplines will be explored, which will

enable the researcher to discuss their suitability for outdoor recreation. Although there has been some research conducted concerning the behavioural change of recreationists in other countries, this research will be the first of its kind to develop a theoretical framework specifically for use in the design of behavioural interventions with regard to outdoor recreation in Ireland. The framework resulting from this research will enable the creation of long-term behavioural change interventions which will aid in the development of land management and educational strategies for the sustainable development of outdoor recreation in the future.

While the theme of behaviour will be discussed in greater detail in Chapter 2, it is crucial to briefly introduce one of the most prominent behavioural theories at this stage in order to aid in justifying the need for this research. The theory of planned behaviour has been used in both recreation ecology and environmental psychology (Sheeran, Trafimow and Armitage, 2003; Brown, Ham and Hughes, 2010; Vagias et al., 2014). One of the main concepts of the theory of planned behaviour is that individuals make rational choices: a person's actions are not spontaneous or unpredictable, and their behaviour results from the intention to perform a specific behaviour. The stronger the intention, the more likely an individual is to conduct or perform that behaviour (Steg, Van Den Berg and De Groot, 2013). The use of the theory of planned behaviour in recreation ecology could be due to its coherent rationale.

The theory of planned behaviour posits that there are multifaceted influencers of behaviours and that interrelationships exist between these aspects. These aspects include attitude, social norms and perceived behavioural control. Each of these aspects is discussed further in Chapter 2. The attitudes of outdoor recreationists are

mostly unknown in Ireland, despite the large body of work conducted by Motherway et al., (2003) on the general population. This research addresses this gap.

1.2 Significance

Given the positive and negative impacts as a result of outdoor recreation and activity tourism, it is, therefore, essential to understand the adverse impacts of activity tourism in order to design more effective strategies for the sustainable development of this industry. This research will inform and aid in the development of interventions which can mitigate a significant proportion of the negative impacts to wildlife, habitats, environment, as well as conflict and user enjoyment which are a result of irresponsible outdoor recreation.

The implementation of strategies without prior knowledge of community opinions or collaboration with local communities can severely hinder their success (Séraphin, Sheeran and Pilato, 2018; Pannett, 2018). A seemingly paradoxical task falls to landowners, park managers and governmental authorities — the mission of protecting the natural environment while at the same time providing opportunities for outdoor recreation to millions of people per year. This research will serve as a practical guide, which highlights the importance of community engagement, and will be essential to effective communication and delivery of interventions in the context of outdoor recreation in the future.

This research addresses the dearth in the literature regarding outdoor recreation from an Irish context. Future developments will benefit from the outputs of this research. An evaluation on the use of behavioural theory in the design of interventions will be a significant output of this research. This will provide a foundation of knowledge,

from which future research in this area can be built. This research is the first of its kind from an Irish perspective and be essential to the future sustainable development of this sector.

1.3   Research Aims and Objectives

There are two interdependent aims of this research. The first aim of this research is to address the dearth of literature regarding the behavioural prediction and design of interventions in the context of outdoor recreation and environmental protection in Ireland. The second aim of this research is to investigate how behavioural change has been achieved in a range of parallel contexts and identify the combination of factors necessary to effect positive change. In order to achieve these aims, a number of interlinked objectives are described below.

It is necessary to understand what the environmental attitudes and behaviours of outdoor recreationists are. As such, the first objective of this research is:

- **Objective One:** Examine the attitudes and behaviours of outdoor recreationists in Ireland regarding environmentally responsible behaviour.

With this information gathered, it is necessary to understand how behavioural change theory has been conducted in the past and what are the current main channels of thought on the issue. One cannot expand upon a field of knowledge without a clear understanding of the most relevant existing knowledge. As such, a multi-disciplinary investigation will be conducted in order to achieve the second objective of this research:

- **Objective Two**: Review and critique the evolving theories relating to behavioural change.

Building on the theoretical domain, an investigation of the application of behavioural interventions will be necessary to achieve the aim of this research. Behavioural interventions and strategies to induce behavioural change can be complex, especially when trying to evaluate their effectiveness and generalisability to the context of outdoor recreation in Ireland. As such, the third objective of this research is to:

- **Objective Three:** Investigate and evaluate the efficacy of strategies used to achieve behavioural change in a range of contexts.

The achievement of the first, second and third objectives will allow the researcher to frame and understand the concepts of the fourth objective adequately. This objective will focus on the development and design of a framework which illustrates the factors that can be used in the design of a behavioural intervention in order to induce behavioural change in the context of outdoor recreation:

- **Objective Four:** Develop and apply a theoretical framework illustrating the factors required to engender environmentally responsible behaviours in recreationists.

1.4 Context

This section examines factors that establish the context of this research. The economic importance of tourism to the global economy is significant: reports from the United Nations World Tourism Organisation identify tourism as a major category of international trade in services. In 2018, for instance, the United Nations World Tourism Organisation (UNWTO) (2019) estimated the total value of tourism exports as up to US$1.7 trillion. Ireland has also benefited from the economic benefits of tourism. The total tourism expenditure in Ireland in 2018 was approximately €9.4 billion (Fáilte Ireland, 2019).

1.4.1 Responsible Recreation

Despite the benefits of outdoor recreation and activity tourism, the irresponsible use of the outdoors can have a multitude of negative impacts. In 2004, the Department of Community, Rural and Gaeltacht Affairs set up a countryside recreation council Comhairle Na Tuaithe (Comhairle Na Tuaithe, 2006). Comhairle Na Tuaithe used the term "countryside recreation" to describe outdoor recreation in its National Countryside Recreational Strategy (Comhairle Na Tuaithe, 2006). This organisation works with people from farming organisations, recreational users of the countryside and state bodies with a responsibility for or interest in the countryside.

Comhairle Na Tuaithe aims to protect and develop access to the countryside for the purpose of recreation as well as creating a countryside code. Comhairle Na Tuaithe advocates the use of Leave No Trace as a means to develop outdoor recreation sustainably. Leave No Trace Ireland is described in more detail in Chapter 2. Leave No Trace is an environmental charity dedicated to the education and dissemination of minimal impact outdoor recreation practises. It does this through a variety of mediums.

This research has been designed and conducted in close cooperation with Leave No Trace Ireland. Leave No Trace Ireland aims to arm people with the knowledge of what impacts can occur when the wrong behaviours are carried out and believes that a change in attitude in how people see their interaction with the natural environment can modify the way people use it. Regarding behavioural change in the context of outdoor recreation, one of the most popular and least intrusive means of inducing responsible recreation has been the promotion of low-impact practices and outdoor education. Leave No Trace Ireland has gained significant support and endorsement

by a number of State agencies. However, a significant challenge for Leave No Trace Ireland is the dearth of relevant literature on the attitudes and behaviours of outdoor recreationists from an Irish perspective. If Leave No Trace Ireland is to continue its growth and official endorsement by the relevant agencies, then it must operate using the best available information. This is discussed in more detail in Section 2.6.4.

Numerous scholars attest that by informing the public and by providing education, the opportunity for behavioural change increases (Christensen and Cole, 2000; Jensen, 2002; Marion and Reid, 2007). The benefit of using education is that it provides the individual with the knowledge and skills for determining the correct course of action, and, therefore, the individual will behave responsibly.

1.4.2 Theoretical Context

The range and scale of behavioural theories, as well as the interventions used to change behaviour, are well documented across several disciplines. Human behaviour is a fascinating area of study that is both intricate as well as deceptively simple. Scholars have dedicated entire careers to understanding the factors necessary to change behaviour. However, to date, no theory has been developed to account for all human behaviour. In addition, the application of rigid theories of behavioural change has encountered challenges, particularly given the range and diversity of outdoor recreation and activity tourism. Furthermore, the use of strategies developed in other countries can face significant challenges due to geographical and cultural differences (Haukeland, 2011; Hynes, Norton and Corless, 2014).

While there is a significant amount of research conducted into understanding behaviours concerning health science and other areas, behaviour in outdoor

recreation has not been given the same level of focus. As a result, behavioural change techniques have been introduced in the past using pre-existing theories without evidence regarding their effectiveness. Alternately, techniques that are not based on any behavioural theory have also been introduced to a number of interventions, with varying levels of success. This research is the first of its kind to develop a theoretical framework for behavioural change with the specific context of outdoor recreation.

As this research focuses on an extremely complicated and diverse topic, as evidenced by the literature review, the pragmatic method of inquiry will allow the search for a practical, logical and useful solution to complicated problems. The pragmatic approach makes decisions based on the situation and opportunities that can emerge as a result of an inquiry (Patton, 2015). This research searches for solutions that, at the very least, can shed some light on a particular issue. This research, as well as the area of social science and behaviour in general, will benefit significantly from the principles of pragmatism. Pragmatism is discussed further in Chapter 3.

1.5   Structure of the Thesis

Chapter 2 gives a background in the area of outdoor recreation and activity tourism in Ireland as well as the many benefits associated with both. The literature review focuses on the negative impacts caused by irresponsible behaviours as well as the attempts made to mitigate the negative impacts. Chapter 2 introduces Leave No Trace Ireland and its contribution towards the sustainable development of outdoor recreation and activity tourism in Ireland. To better understand the concept of behaviour, several behavioural theories are discussed and critiqued to examine the influencers of behavioural intention. Subsequently, the efficacy and applications of behavioural change interventions in Ireland and abroad are examined. In addition, a

theoretical framework, which emerged from a thorough investigation of the literature, is presented that will illustrate the factors necessary to induce behavioural change in outdoor recreationists. This framework acts as the basis on which the methodology of this research will be built.

Chapter 3 outlines the methodological approach used in this research as well as the justification of the research design. The mixed-methods approach is explained in this chapter, explaining both the quantitative and qualitative methodologies separately as per sequential triangulation as well as a justification for its use. There were four distinct phases of data collection and analysis in this research in order to achieve the aims and objectives of this research. Finally, the limitations and ethical considerations of the chosen research are examined. This research is merely a logical chain of practical steps taken when the researcher was faced with new questions and opportunities during the research.

Building on the theoretical domain, the researcher developed and applied the methods of sequential triangulation which is discussed in Section 3.3.2. The quantitative methodology consisted of a user completed questionnaire, which was distributed at several outdoor recreational areas and events. The Phase 1 quantitative survey was conducted first, and the analysis of the survey data led to the design of a template for semi-structured expert interviews which allowed the researcher to discuss and develop themes that arose through the quantitative data collection Phase 2. During the collection, analysis and dissemination of data, the creation of further questions that required more in-depth investigation occurred; it became clear that a series of expert interviews was necessary to understand the application of theoretical knowledge with real-world examples and how the two interrelate and affect each

other in Phase 3 (See Section 3.6). Finally, a theoretical framework was developed, applied in a pilot test and evaluated in Phase 4 (Section 3.7).

Chapter 4 and 5 deal with the range of data, both qualitative and quantitative, used to develop the findings and ultimately, the theoretical framework. The findings chapters are divided into internal and external factors in order to illustrate the fundamental relationships that exist between individuals and the outside world. Chapter 4 examines the internal factors of the framework, while Chapter 5 examines the external factors. Chapter 6 discusses the testing and evaluation of the theoretical framework. These chapters present and discuss the main findings of this study. The results are discussed with regard to the objectives of this research and literature review.

Conclusions and recommendations are delivered in Chapter 7. Conclusions are presented on the main findings, and critical points are highlighted. Recommendations based on the objectives of this study are presented, these include recommendations for policy, practical application and future research. Finally, a self-reflection section on the overall research process is presented.

Chapter 2:   Literature Review

2.1   Introduction

An early and essential step in the research process is to identify and review the accumulated knowledge of the topic in question (Neuman, 2013). Following Neuman's guidelines on the purposes of a literature review, this chapter will demonstrate a familiarity with a large body of knowledge covering a variety of disciplines (tourism, recreation, behavioural change). This literature review will examine the accumulation of prior research and will incorporate that literature into the context of this research. In addition, by learning from previous work, new ideas will be formed (Neuman, 2013, p.126).

This chapter will first investigate the current state of outdoor recreation and tourism in Ireland as well as the benefits associated with both. Tourism in a broad sense will be described first, after which more specific focus will be shown to activity tourism.

The negative impacts that can occur through both outdoor recreation and activity tourism will then be discussed. Later sections in this chapter will review attempted solutions to the negative impacts associated with outdoor recreation and activity tourism. Further sections will examine the concepts of attitude and behaviour as well as the most prominent theories relating to behavioural change. Furthermore, an in-depth analysis of the design and implementation of behavioural interventions will be conducted in order to deduce the efficacy of theory-based interventions within the context of this research and to identify potential pitfalls. An introduction to Leave No Trace Ireland will be provided as well as an examination of Leave No Trace's relevance in the sustainable development of outdoor recreation and tourism in

Ireland. Finally, a preliminary theoretical framework which brings together the findings of the literature review into a single visual synopsis will be presented.

The literature examined included academic books, academic journals and grey literature (organisation reports, policy statements and unpublished works). The United States of America is a primary source of literature in the field of recreation ecology and behavioural change, however other countries like the United Kingdom, Spain, as well as a number of Asian and Scandinavian countries, have conducted research in this field. In regard to tourism, there are a number of relevant countries who have investigated the effects of tourism. Behavioural change research has a large amount of representation in health science. Additionally, there have been a number of studies that have investigated behavioural change in a range of contexts. While some research exists on the development of sustainable outdoor recreation and tourism in other countries (Welford and Ytterhus, 2004; Macbeth, 2005; Haukeland, 2011; Wishitemi et al., 2015), there is a dearth of specific knowledge of attitudes and behaviours and the impact of behavioural change strategies from an Irish perspective.

2.2 Activity Tourism

Tourism is defined by the United Nations World Tourism Organisation (UNWTO) as a "social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes" (UNWTO, 2017). This literature review mainly focuses on a type of tourism called activity tourism or adventure tourism (Lee, Jan and Huang, 2015) as this type of tourism involves participation in outdoor recreation by visitors. Determining what constitutes activity tourism can be complex and subjective (Swarbrooke et al., 2003). A vacation can be described as activity tourism

if it comprises of a combination of physical activity, cultural exchange and interaction with the environment. The ideal activity tourism vacation encompasses all three factors (Adventure Travel Trade Association, 2013). Activity tourism (also called adventure travel) can consist of a wide variety of outdoor activities, including, but not limited to, walking, hiking, fishing, camping, swimming, kayaking and bird watching. There are other terms that are used instead of or alongside activity tourism such as nature-based tourism, which has subcategories like ecotourism and wildlife tourism. Then in the spectrum of adventure tourism, there are sub-niches like expedition tourism (Swarbrooke et al., 2003).

Traditionally, activity tourism may have been viewed as strenuous, high-octane pursuits designed for outgoing people; in reality, however, about 90% of activity tourism is based on "soft" activity, with walking, cycling and fishing being the most sought after (Adventure Travel Trade Association, 2013). The popularity of activity tourism, in general, has risen substantially in recent years; a report by Fáilte Ireland (2013) notes that the percentage of adventure travellers from the Americas and Europe has increased from 26.3% in 2009 to 41.9% in 2012. When examining the activities conducted by tourists, a more recent report from Fáilte Ireland estimated that over 24.5% of overseas tourists engaged with hiking and walking on their holiday. In addition, over 26% of domestic tourists engaged with hiking and walking on their holiday (Fáilte Ireland, 2019).

2.2.1 Tourism in Ireland

Tourism in Ireland has seen a remarkable rise in recent years, particularly in the last decade (Fáilte Ireland, 2019), as discussed in Chapter 1 (see Section 1.1.1). Furthermore, there has been a steady growth in tourists heading to remote rural

locations, enticed by programs such as the Wild Atlantic Way (WAW) and a desire to participate in outdoor activities during their vacation (Fáilte Ireland, 2018c). Fáilte Ireland also emphasised the increased popularity of visiting national parks for the purpose of outdoor recreation among domestic and overseas tourists (Fáilte Ireland, 2016). International tourism literature evidenced the use of the countryside for activity tourism and its links with a multitude of beneficial impacts in terms of health, wellness and the economy (Liu et al., 2014; Romagosa, Eagles and Lemieux, 2015), these benefits are discussed in Section 2.2.3.

Ireland receives most of its visitors from Great Britain, North America, France and Germany (Fáilte Ireland, 2019). These four core markets provide approximately 68% of the total overseas visitors. Although the British market represents the highest proportion of visitors, it is the French and German market that has been identified as a promising avenue for future development (Tourism Ireland, 2013). For instance, Germany has the world's second-largest outbound travel market: approximately 53% of holidaymakers take their vacation abroad. Currently, Ireland receives about 1% of the German outbound market. In 2018, Ireland hosted over 763,000 German holidaymakers, which is an 18.4% growth on 2017 (Fáilte Ireland, 2019). These markets are of particular interest to Ireland due to the uncertainty surrounding the possible impact of Brexit on people travelling from the United Kingdom. In addition, it is important to recognise the origin of activity tourists as different interventions can be utilised based on geographical and cultural factors, which greatly influence the success of behavioural interventions (see Section 2.5.4) if used in different areas without consideration. One example of a cultural difference seen in tourists would be the growth of the Asian Market, which has been identified as a potential market in the future (Tourism Ireland, 2017).

Fáilte Ireland, in conjunction with Tourism Ireland, has identified three main types of tourists that visit Ireland. This segmentation of the tourist market was the result of three studies aimed at revitalising Irish tourism (Fáilte Ireland, 2012; Tourism Ireland, 2013; Fáilte Ireland, 2014). The three main types of tourists are the Social Energisers, the Culturally Curious and the Great Escapers.

Fáilte Ireland defined these tourists based on their characteristics: who they are, what they want on vacation, what they do not want in a vacation, what they do while on vacation and what their typical vacation behaviour is. The tourist group that will be mainly focused on is this research is the Great Escapers as this is how the majority of activity tourists would be labelled. However, the Culturally Curious also engage with soft activities such as walking, especially when visiting landscapes and cultural sites (Fáilte Ireland, 2014).

2.2.2 Activity Tourism

Ireland ranked in the top 10 for activity tourism destinations in developed countries in 2010 (Adventure Travel Trade Association, 2012). Ireland has been moved out of the top ten in recent years (Adventure Travel Trade Association, 2015), which is surprising considering that the Adventure Travel Trade Association suggested Ireland as a location for further development of activity or adventure tourism. The ATTA highlight positive characteristics such as the available resources and economic freedom of Ireland as a possible destination for adventure travel in its report (2018).

2.2.3 The Positive Impacts of Tourism

The tourist industry has numerous positive impacts in Ireland. This section examines

these benefits, which include economic and societal benefits as well as the use of tourism for environmental conservation. It is important to examine these impacts as they support the need for the sustainable development of activity tourism and the necessity for this research.

Economic Benefits

There are numerous benefits to tourism. From a financial point of view, tourism generates a significant income to the Irish economy. Section 1.1.1 briefly described the economic value of tourism. In addition to this revenue, there are intangible benefits to the economy as a result of tourism. This includes increased employment in rural areas, which can reduce the need of local people to migrate to larger cities. Tourism also aids in the establishment of small businesses that provide goods that are unique to the area, an example would be Dingle Distillery, which produces a number of artisan spirits such as whiskeys and gins.

The promotion of tourism strategies like the Wild Atlantic Way (WAW) by Fáilte Ireland has drawn tourists from around the globe to mostly rural locations along the west coast of Ireland (Tourism Ireland, 2013; Fáilte Ireland, 2014). Studies have shown that marketing and tourism strategies like the WAW can provide new sources of income to these areas, which in turn leads to a growth of small and medium enterprises and helps combat the migration of people from rural locations to more populous areas (Aronson, Milton and Blignaut, 2007; Stronza and Gordillo, 2008; Stead, 2011). The WAW continues to be a crucial factor in the development of tourism and job creation along the west coast of Ireland (Fáilte Ireland, 2018b).

Activity tourism can result in numerous economic benefits. Studies have suggested

that activity tourism can provide employment opportunities for residents if planned correctly (Campbell, 1999; Bell et al., 2007; UNWTO, 2014). Furthermore, a report from the Adventure Travel and Trade Association (2013) estimates that activity tourists spend on average 40% more money and 30% longer on vacation than other tourists. Great Escapers are looking for the wow factor on their vacation and so are more drawn to scenery and immersion into local communities when compared to tourists in general. This, in turn, has substantial knock-on economic benefits to services such as catering, hotels and guided tours (Swarbrooke et al., 2003; Irish Sports Council, 2005; Bell et al., 2007), not to mention gift shops for native goods (Mühlhäusler and Peace, 2001). Moreover, the facilities developed for the tourism industry are available to local communities, which can aid the rural populations by supporting employment and conservation and by improving the quality of life. This is clearly demonstrated in the recent development of Greenways and Blueways in several Irish locations and the future plans for the development of tourism in Ireland (Department of Transport, Tourism and Sport 2015).

Conservation

Conservation through nature-based tourism can be a contentious issue. Some researchers suggest that it can provide support for the protection of fragile ecosystems (Lee, 2013; Imran, Alam and Beaumont, 2014). Other sources believe that the sheer number of tourists visiting these sites may cause more harm than good (Lindsay, Craig and Low, 2008; Das and Chatterjee, 2015). There is evidence to suggest that activity tourists can be harmful to local ecosystems. This highlights the need for adaptable policy, design and educational strategies to protect these natural resources. In addition, activity tourism can also provide much-needed funds for conservation efforts that rely heavily on government subsidies and raise awareness

of environmental issues (Kiss, 2004; Corvalan, Hales and McMichael, 2005).

Conservation through nature-based tourism is not only a financial opportunity, by allowing access to protected and vulnerable areas, conservationists are able to reach audiences and disseminate information about their work. Conservationists are able to increase their interactions with the public and grow an environmental concern in visitors to these areas (Brightsmith, Stronza and Holle, 2008). By allowing access to vulnerable areas, a clear argument of why conservation is needed can be developed, in addition, the use of social media by visitors allows a wider audience to see the environmental issue and can raise awareness.

A report by the Commission for the Economic Development of Ireland (CEDRA) listed the development of tourism and recreation as a significant factor in the development of rural areas (CEDRA, 2019). In developing countries, the economic benefits can act as incentives for local communities to promote biodiversity and nature conservation, as well as to alter their traditional practices that may impact the ecosystem or disrupt tourist infrastructure (Wunder, 2000; Sanchirico, Cochran and Emerson, 2002). Studies have shown that by involving the local community in the policymaking and the promotion of activity tourism, a community can be united to work together (Tsaur, Lin and Lin, 2006; Rowat and Engelhardt, 2007).

From an Irish perspective, there are several ways in which nature-based tourism can act as an incentive to promote conservation efforts (Scarpa et al., 2000; Irish Sports Council, 2005; Coillte, 2017). If looking at the benefits from a purely financial standpoint, then the immediate tangible benefits of economic growth can act as an incentive to protect a valuable resource (Irish Sports Council, 2005). Using

willingness to pay and costless choice models, The Irish Sports Council (2005) estimated that the expenditure on equipment such as walking boots and other essentials to be around €46.7 million. Additionally, the total expenditure by trail users in local areas on items such as food, drink and accommodation is €260 million, which gives a total direct economic expenditure impact of almost €307 million annually (Irish Sports Council, 2005). Furthermore, by including the non-market value of the trails as well as the expenditure of overseas visitors, the economic value of trails in Ireland was estimated to be €540 million annually. The report also examines the economic value of forest recreation using the same methods, which is estimated to be €503 million annually (Irish Sports Council, 2005). A more recent example is provided by a report by Collite (2017). In Collite's report, an estimated 1.5 million overseas visitors engaged in outdoor recreation in 2014, and the market for this was valued at €900 million. Furthermore, the economic value of recreational resources was calculated at €142 million per year due to the prospect of the future growth of tourism and the development of new recreational facilities (Coillte, 2017). It is essential to view the indirect benefits that economic growth can have in an area, such as an increase in quality of life, population growth and the development of amenities. Studies have investigated the value of recreational land use as opposed to traditional agriculture in rural areas (Hynes, Buckley and van Rensburg, 2006; Buckley, van Rensburg and Hynes, 2009). Furthermore, new sources of income may act as an incentive for landowners to conduct less intensive farming practices rather than potentially harmful practices. The report by Buckley, van Rensburg and Hynes (2009) suggested that there is support for developed formal access routes to recreation in both upland and low land areas, to the extent that a willingness to pay has been identified by a portion of the population. The study posited the idea that

outdoor recreation and activity tourism could become important components of the multi-functional use of agricultural land in the future (Buckley, van Rensburg and Hynes, 2009). These examples suggest the benefits that tourism can have on Ireland's conservation efforts. The imagery used in the promotion of the "Emerald Isle" and "Wild Ireland" is a major attraction to prospective tourists, and the sustainable development of precious resources will be vital for the tourism industry's continued growth and prosperity.

2.3   Outdoor Recreation

Chapter 1 introduced the concept of outdoor recreation and its link with activity tourism. Outdoor recreation and activity tourism have obvious similarities regarding benefits to the economy and health while also relying on the same natural resources. Activity tourism and outdoor recreation have been separated for the purposes of this literature review as there may be differences in the attitudes and behaviours of residents when compared to the activity tourists visiting the area. However, the findings of this research (Chapters 4, 5 and 6) will, in the main, refer to recreationists and activity tourists collectively.

While organisations such as Fáilte Ireland produce comprehensive reports on the number of tourists coming into the country (Fáilte Ireland, 2016), the number of residents participating in outdoor recreation is much harder to quantify. Outdoor recreation can be referred to by different terms. In Ireland, Comhairle Na Tuaithe uses the term countryside recreation which "applies to sporting, recreational and vacation pursuits based on the utilisation of the resources of the countryside and which contribute to healthy active lifestyles" (Comhairle Na Tuaithe, 2006). This research will use the term outdoor recreation as it encapsulates the range of areas in

which outdoor recreation can take place. In addition, this term is also more inclusive of urban green spaces. In 2004, the Department of Community, Rural and Gaeltacht Affairs set up a countryside recreational council, the term countryside included land, water and air. (Comhairle Na Tuaithe, 2006).

Soft activities such as walking have been regarded as the most commonly undertaken form of outdoor recreation (Adventure Travel Trade Association, 2013). There could be an argument made that since hillwalking is a more strenuous form of activity, it should be differentiated from other types of walking such as parkland, powerwalking, race walking, trekking and dog walking. However, different types of walking have been amalgamated in reports before, e.g. Fáilte Ireland (2018c). It can be difficult to distinguish different types of walking activity based on difficulty as a certain amount of assumed difficulty is entirely subjective: what constitutes a herculean effort for one person could be a leisurely stroll for another. There is difficulty in distinguishing the different types of walking in the literature as well as the possibility that a recreationist could theoretically engage with multiple forms of walking on a single trip. For the purpose of this research, all forms of walking, aside from dog walking, will be considered together.

2.3.1 Outdoor Recreation in Ireland

Ireland's rugged Atlantic coastline, forests, national parks and mountains have made it a prime destination for outdoor recreation and activity tourism (Irish Sports Council, 2005; Comhairle Na Tuaithe, 2006; Gratton and Kokolakakis, 2013; The Border Midland Western Regional Assembly, 2014).

Evidence of the recent growth in outdoor recreation can be seen in the increase and

range of outdoor recreation events being organised throughout the country (The Border Midland Western Regional Assembly, 2014). There are a number of studies that have advocated and demonstrated the demand for the development of more green spaces and recreational facilities in Ireland (Buckley, van Rensburg and Hynes, 2009). An excellent example from an Irish perspective can be seen in the development of a five-year recreational development plan by Coillte (2017). Coillte is currently around two thirds through a five-year plan (2017–2021) for the development of outdoor recreation on public lands and waterways. The five-year plan highlighted the economic importance of outdoor recreation and pledged significant investment in the further development of the sector. The outdoor recreation plan aimed to develop an extensive network between public bodies to support, guide, inform and coordinate recreation provision on public lands. This network will link forests, rivers, lakes, canals, Blueway's, national parks, Greenways and nature reserves across the entire country by co-operation between a number of governmental bodies such as Bord na Mona, Inland Fisheries Ireland, the National Parks and Wildlife Service and Waterways Ireland. The total investment in the five-year plan is estimated at €165 million.

The recreational plan produced by Coillte aims to change the traditional view of outdoor recreation as a high-octane, thrill-seeking activity. The establishment of extensive Blueways and Greenways supports the development of 'soft' recreational activities. In addition, the variety of possible outdoor recreational activities makes Ireland especially suitable for activity tourism as it has an abundance of natural resources to accommodate outdoor recreation (Manton, Hynes and Clifford, 2016; McGurk et al., 2019).

In addition, a large proportion of outdoor recreation takes place in areas that are designated as Special Areas of Conservation or Special Protection Areas, which means that these areas are designated for the conservation of protected species of plants and animals (Stokes, O'Neill and McDonald, 2004; The National Trails Office, 2012; Crushell, Foss and Kirwan, 2016). This highlights the importance of the sustainable development of outdoor recreation and activity tourism.

2.3.2 The Positive Impacts of Outdoor Recreation

There are numerous positive impacts linked to the development and practising of outdoor recreation (Comhairle Na Tuaithe, 2006; Comley and Mackintosh, 2014). These benefits are broadly described under the following subheadings: economic benefits, social/educational benefits and health benefits.

Economic Benefits

Section 2.2.3 outlined the economic benefits associated with tourism, particularly activity tourism. It is worth noting that services provided for the convenience of tourists in these areas are also available to residents, who spend a portion of their income on recreation thus also contributing to the local economy. The Great Western Greenway based in Co. Mayo has been widely praised as successful and has provided attention and funding for further greenway developments. A report by Fáilte Ireland / Fitzpatrick Associates (2011), estimated approximately €940,000 in expenditure by local residents, which consisted of 34,400 "visits" to or "uses" of the Greenway, at an average spend of €27.31 per visit or use. Due to the well-cited success of the Great Western Greenway, a separate study investigating the development of Greenways as a tourism resource was conducted by McGurk, et al. (2019). The results from this study supported the earlier reports on the economic value of the Greenway (McGurk

et al., 2019). There is also an indirect positive financial impact to be gained for the government, as participation in outdoor recreation has been suggested as a treatment for several physical and mental health issues (Godbey, 2009; Romagosa, Eagles and Lemieux, 2015). This can reduce the number of patients requiring medical or psychiatric treatment in hospitals, thus saving the government money (see Section 1.1.1).

Coillte's outdoor recreation plan estimated the economic value of 'well-being', associated with access to the outdoor recreational facilities to be at least €500 million per year (Coillte, 2017). Sports clubs, parks, charities and outdoor centres gain consistent revenue in areas that may rely on a seasonal tourist industry (Knight and Gutzwiller, 1995; Wunder, 2000), while also providing full and part-time employment for local inhabitants (Southwick Associates, 2012; Gratton and Kokolakakis, 2013).

Social and Educational Benefits

The use of natural resources for outdoor recreation can have a profound social benefit. For instance, in Nordic countries, the idea of *allemansrätten* or everyman's right to nature is incorporated into their laws. *Allemansrätten* is the right of all citizens to interact with nature for personal use (Gelter, 2000). Furthermore, participation in outdoor recreation has enabled an increase in environmental awareness as well as allowing for environmental education to be conducted in green spaces. In addition, outdoor recreation and activity tourism have helped rejuvenate small rural communities, which reap economic benefits as a result of the protection of the natural environment. Another societal benefit comes with the multifunctional use of agricultural land, which has become the topic of study in many European

countries, including Ireland (O'Leary, McCormack and Clinch, 2000; Kassioumis et al., 2004; Pigram and Jenkins, 2005; Cawley, Bicalho and Laurrens, 2013). This initiative has allowed the development of outdoor recreation development in areas where recreational space may have been limited. It also aids in the resolution of possible conflict between landowners and recreationists.

Health Benefits

Considering the health benefits associated with outdoor recreation, scholars such as Godbey (2009) explained it through the context of "wellness" as described by the World Health Organisation. According to the World Health Organisation (2016), "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Outdoor recreation contributes not only to physical wellbeing but also to mental health. Participation in outdoor recreation has been linked by researchers to aiding in the treatment of mental health problems such as depression, stress and insomnia (Jenkins and Pigram, 2005; Bell et al., 2007; Mann and Leahy, 2010). A review of the literature suggests that access to green spaces is becoming important, especially in urban areas, and this has resulted in it becoming an essential factor in urban planning (Daniel, 2001; Thompson, 2002; Pietilä et al., 2015).

 The research into the benefits of outdoor recreation is substantial and continuing to grow (Knight and Gutzwiller, 1995; Godbey, 2009; Gratton and Kokolakakis, 2013). One project of interest is the Nature and Environment to Attain and Restore (NEAR) Health project conducted by the National University of Ireland Galway. This project aims to design and pilot 'inclusive nature-based solutions to assist communities' so that they value a healthy environment, maintain healthy lifestyles and promote and

restore wellbeing.

The prevention of physical health complications, as suggested by Godbey (2009), is most effective when outdoor recreational activity is routinely engaged. For example, Godbey (2009) suggested that going on regular walks has been linked to a more than 30% reduction in the risk of heart disease in women. Other studies link the practice of outdoor recreation to benefits such as weight loss, blood pressure management, lowering the risk of strokes and a reduction in joint pain. Although caution is advised when examining these links as human health systems are complex, support for the health benefits of outdoor recreation is substantial in many countries (Morris, 2007; Godbey, 2009; The Border Midland Western Regional Assembly, 2014; Pietilä et al., 2015).

2.4   Negative Impacts

Previous sections have discussed the use of natural resources for outdoor recreation and activity tourism and the multitude of beneficial impacts (see Section 2.2.3 and 2.3.2). However, as stated by Leung and Marion (2000, p.23), "Negative impacts on wilderness are an inevitable consequence of recreation". It is practically impossible to have zero impact on the environment, and many impacts are a result of uninformed, unskilled and careless actions. The impacts associated with irresponsible outdoor recreation have been described by Manning and Anderson (2012) as fitting into three broad categories. These categories are:

- resource impacts such as damage to soils and water quality as well as habitat disturbance and biodiversity loss
- experiential impacts such as crowding and land use conflict
- impacts affecting land management such as trail degradation.

These impacts can be intensive and long-lasting depending on the activity and the environment (Christensen and Cole, 2000; Belnap, 2003; Randall and Newsome, 2008). In addition, categorisation does not mean isolation, and this section will show that these impacts can be connected and synergistic.

2.4.1 Resource Impacts

This section examines some of the drastic effects human behaviour can have on ecosystems and the animals living within. A recent study claims that approximately 5% of global land remains unaffected by humans (Kennedy et al., 2019). This figure is less than what has previously been estimated (19%) (Venter et al., 2016). Despite the ambiguity and debate in the literature on the true extent of human modification globally, these figures demonstrate that there are few areas on this planet that can claim to be wholly untouched or unaffected by man. In addition, the concept of wilderness can be subjective to the individual depending on environmental or specialised knowledge. However, there is significant effort underway to preserve or at least maintain what remains of the supposed wilderness for the future. The range of impacts that can result from irresponsible recreational behaviour has created a new discipline of inquiry known as recreational ecology (Knight and Gutzwiller, 1995; Pickering and Hill, 2007; Törn et al., 2009). The description of every possible impact that can occur is not within the remit of this research. Instead, the following sections focus on some of the most prominent resource impacts and their effect on the ecosystem. These impacts can be either direct, such as trampling of ecologically sensitive areas such as sand dunes (Kindermann and Gormally, 2013; The Border Midland Western Regional Assembly, 2014), or indirect, such as the addition of nutrients to the environment from improper waste disposal (Bridle and Kirkpatrick,

2003). There exists a veritable cornucopia of potential impacts that can be classed under resource impacts. The impact humans have on local wildlife is diverse and depends on both the activity and the environment. For example, studies illustrate that the fitness (contribution of an individual to the next generation of offspring) of some bird species is directly affected by the intrusion of outdoor recreationists. Studies have shown that this intrusion on bird nesting grounds is sufficient to disturb populations (Müllner, Linsenmair and Wikelski, 2004; Lindsay, Craig and Low, 2008).

In addition to the disturbance of wildlife, habitat destruction can be a significant consequence of irresponsible recreational behaviour; the scale and spatial effect of the impact can at times be challenging to measure (Coppes et al., 2017). Regarding habitat destruction, it is unfortunate that outdoor recreation occurs in some of the most fragile ecosystems such as bogs and sand dunes (Andersen, 1995; Pigram and Jenkins, 2005; The National Trails Office, 2012; The Border Midland Western Regional Assembly, 2014). These areas are established over hundreds or thousands of years and they serve a multitude of benefits such as carbon sinks or as a nexus for biodiversity. These ecosystems can quickly suffer devastating damage from relatively little recreational activity (Kindermann and Gormally, 2013). The Millennium Ecosystem Assessment gives a detailed report of both the tangible and intangible benefits provided by healthy ecosystems as well as the cost of their destruction (Corvalan, Hales and McMichael, 2005). Irresponsible camping and the proliferation of campfires has also been shown to result in severe consequences for the environment (Ryan, 2003; Marion and Reid, 2007; Manning and Anderson, 2012). This is especially relevant given the damage caused by wildfires in recent years, for example, a single disposable barbecue is believed to be the cause of a

wildfire that destroyed 13 acres of sand dune in Curracloe, County Wexford in 2018 (Burns and Hutton, 2018).

Another consideration is the disturbance caused by domestic animals on the environment. Despite the domestication of dogs, or "man's best friend" as described in a poem by Ogden Nash, over the last 11-12,000 years, dogs still retain the base, primal instincts to hunt and chase (Sime, 1999; Gompper, 2014). When these instincts are triggered, they can have severe impacts on wildlife and can significantly disturb wildlife populations such as nesting birds (Scottish Wildlife Trust, 2007; Manning and Anderson, 2012; Gompper, 2014). Even when no direct interaction is found between dogs and domestic cattle, the mere presence of dogs can still affect the behaviour of wildlife and livestock due to fouling and scent marking. Dog fouling can lead to localised nutrient enrichment in locations as well as a hazard for users of recreational areas (Boyle, 2017).

In addition, conflict and loss of livelihood due to disturbance of domestic livestock is a significant problem (Sime, 1999; Gompper, 2014). While agricultural land may not be considered a wilderness or natural area, it still performs a number of ecosystem services (EPA, 2016). These systems can face significant disturbance due to irresponsible behaviour, with off-leash dogs being a significant factor (Scottish Wildlife Trust, 2007). This is of particular interest in Ireland as the conflict between landowners and outdoor recreationists, due to the disturbance of livestock, has caused severe problems in relation to access to land (Madden, 2009). Over 80% of land is privately owned in Ireland, and access to natural resources outside of official sites (for example, National Parks and Coillte recreational properties) for outdoor recreation is entirely at the discretion of the owner. Although strategies have been

devised to mitigate tension (Comhairle Na Tuaithe, 2006; Coillte, 2017), the relationship between outdoor recreationists and landowners continues to be under strain in Ireland and in other countries (Kassioumis et al., 2004; van Rensburg, Doherty and Murray, 2006; Madden, 2009; Schneider and Wynveen, 2015).

Numerous studies investigated the effects of trampling by outdoor recreationists on soils. Soils can show reduced microbial diversity, vegetation and species composition due to trampling (Randall and Newsome, 2009; Oprządek, 2014). Furthermore, studies demonstrated that some species of plants are more resilient to disturbance (Anderson, 1995; Roovers et al., 2004; Pescott and Stewart, 2014). This suggests that the species that are more resilient to these disturbances tend to persevere and disperse throughout the disturbed area, thus changing the biodiversity of the area (Andersen, 1995; Pickering and Hill, 2007; Pescott and Stewart, 2014). Also of note is the risk of the introduction of invasive species (Potito and Beatty, 2005). The introduction of invasive species has become a significant issue in the Irish countryside in recent years in both terrestrial and marine environments (Hynes, Norton and Corless, 2014; The Border Midland Western Regional Assembly, 2014). It has been suggested that both outdoor recreationists and tourists are important facilitators in the establishment of invasive species, and they have been targeted for awareness-raising campaigns (Anderson et al., 2015). An excellent example of an invasive species is the case of rhododendron in Killarney National Park. Located in County Kerry, Killarney National Park is spending hundreds of thousands of euros each year in the eradication of rhododendron. This invasive species is virulent and widespread in many areas of the park. While rhododendron seeds can be dispersed by the wind, off-trail trampling, as well as other irresponsible activities by recreationists can enable the establishment of this species (Cross, 1981; Fáilte

Ireland, 2018a). Thus far, attempts to control it have used significant amounts of the park's manpower and budget.

The use of water resources like rivers, lakes and the seaside as recreational facilities is well known; however, irresponsible recreational activities and improper waste disposal can have adverse impacts on the water quality of an area (Bridle and Kirkpatrick, 2003; Hammit, Cole and Monz, 2015). Negative impacts on the natural environment can be localised. However, they can have a far-reaching ripple effect throughout the ecosystem (Randall and Newsome, 2009; Pescott and Stewart, 2014). Manning and Anderson (2012) provided a number of case studies on the multiple negative impacts that can occur due to irresponsible behaviour. One such example is the overcrowding and excessive trail use at Acadia National Park in Maine, United States. Overcrowding has resulted in several negative impacts, including trail erosion, trail widening, rock disturbance, impacts on soil, impacts on vegetation, impacts on wildlife, depreciative behaviours, user-created trails and conflict between recreational users.

Environmental assessments on the usage of areas along the Wild Atlantic Way have identified numerous locations which have experienced significant recreational impact (Boyle and Skehan, 2016; Boyle, 2017; Fáilte Ireland, 2018a; CAAS, 2019). These reports have noted numerous examples of damage caused by visitor behaviour and increased visitation. These impacts range across three categories from low/no impact, to medium impact and severe impact with impacts having the potential to be significant, long-term or permanent. Some of the key impacts identified in the reports include; the development of user created trails in vulnerable systems such as sand dunes, increased erosion of soils at concentrated visitation points, an increase in

impromptu fire use which increases the risk of fire damage and the establishment of uncontrolled fires, the disturbance of birds from domestic dogs and the contamination of areas from dog fouling (Boyle, 2017).

2.4.2 Experiential Impacts

Crowding

Although much of the study of recreation ecology is dedicated to the study of adverse impacts on the natural environment, there is also a substantial amount of research into the impacts on the visitor experience (Chiu, Lee and Chen, 2014; Pietilä and Kangas, 2015; Lee and Jan, 2015). Manning and Anderson (2012, p.15), defined crowding as a "subjective, negative estimation of the level of use of a natural resource by other people". The acceptable level of land use by others is subjective, and it varies between the type of person, culture and the kind of environment (Manning and Valliere, 2001; Manning et al., 2002; Sayan et al., 2013). Crowding, and the impacts that crowding can have on both the resource and the experience of users has been a significant issue which has caused many park management officials to investigate the "carrying capacity" of the resource area (Watson, Williams and Daigle, 1991; Manning, 2007) and to study the indicators of crowding (Manning, Lawson and Valliere, 2009). The growth in the participation of outdoor recreation and tourism in Ireland has resulted in an increase in the number of people in areas that were not designed to accommodate such numbers (The Border Midland Western Regional Assembly, 2014). This serves as a prime example of how the negative impacts are interrelated. For example, crowding on a trail may directly affect the experience of the recreationist but may also cause recreationists to walk off the trail, which could affect the environment in the ways discussed in Section 2.4.1 and affect

land management (see Section 2.4.3). In addition, the recently coined phrase 'overtourism' is ubiquitous in recent research journal articles that study the development, or over-development, of tourism in many areas (Séraphin, Sheeran and Pilato, 2018; Séraphin et al., 2019; Kuščer and Mihalič, 2019). Local residents are showing increased dissatisfaction regarding the over-development of tourism in many areas, which is leading to significant pushback to the further development of the sector (Kuščer and Mihalič, 2019).

Conflict

Conflict is another experiential impact of outdoor recreation (Manning and Anderson, 2012). Conflict, according to Manning and Anderson (2012, p.15), "may occur when the behaviour of one individual or group interferes with the goals of another individual or group". This definition originates from the work by Jacob and Schreyer (1980). Many people use outdoor recreation to gain a sense of solitude from busy work or home life (Sayan et al., 2013); however, actions taken by other users, such as a noisy group, can disrupt the recreationist and can have severe effects on their experience (Jacob and Schreyer, 1980; Schneider, 2000; Pilcher, Newman and Manning, 2009).

Conflict can also occur when different recreational activities are taking place in the same area (Vaske and Donnelly, 2007). The use of hiking trails and mountain biking are distinct activities in which the practitioners are known to be at odds due to the use of virtually the same resources (Watson, Williams and Daigle, 1991; Pickering et al., 2010). A study by Teisl and O'Brien (2003) suggested that different types of recreationists can exhibit different levels of environmental concern and behaviour. The study initially found a positive relationship between participation in recreation

and environmental concern, but that the level of concern was different between recreational groups (Teisl and O'Brien, 2003). This is a surprising finding as the inclusive nature of outdoor recreation would suggest that an individual can engage with a variety of recreational activities at any one time. This could suggest it is necessary to discuss how a recreationist might identify themselves (Raymond, Brown and Weber, 2010).

Finally, conflicts can occur through differences in beliefs or social norms, for example, hunting and other types of recreation or land use (Bjerke, Thrane and Kleiven, 2006; Nanang and Hauer, 2008). Individuals opposed to the idea of hunting may experience discomfort and conflict with others and land management when learning that hunting is permitted in that area (Manning and Anderson, 2012). These experiential impacts can have a negative effect on tourism, and if the tourist has a negative experience, there is a possibility that they might share their displeasure with friends, family and online, this can affect the reputation of a destination.

2.4.3 Impacts Affecting Land Management

Outdoor recreation can also have negative consequences on landowners and the management of recreational facilities. For the most part, the negative impacts caused by outdoor recreation are unevenly distributed throughout the area. In fact, many of the adverse impacts are localised to sectors that receive especially heavy visitation or repetitive visitation (Manning and Anderson, 2012). Examples of such sites that suffer severe impacts, as discussed in Section 2.4.1, include trails, campsites, roads and parking areas. In order to meet the growing demand of recreationists and to develop the sector, land management is faced with a difficult task in the development and maintenance of recreational facilities.

As previously mentioned in Section 2.4.1 and 2.4.3, the impacts affecting Irish landowners, such as the disturbance of domestic cattle and other depreciative behaviours are having a significant effect on the development of outdoor recreation and activity tourism. Despite the efforts of Comhairle Na Tuaithe (2006) and other state agencies to dissuade concerns, many landowners have become anxious in recent years to the increased numbers of recreationists using traditional rights of way and the cost of health and safety liability. Many landowners are reluctant to allow the development of access routes through their land. Some of the major concerns remain the cost of insurance, disruption of farming practices and crime/nuisance (Comhairle Na Tuaithe, 2006; Madden, 2009; McGurk et al., 2019). A recent study suggests that half of landowners would not allow a route to run through their farm, regardless of the compensation afforded to them, which is an important finding considering the growing demand for new recreational facilities such as Greenways and Blueways (McGurk et al., 2019).

To lessen the adverse impacts of recreation, the construction of trails and campsites has been used by land managers in the United States for many years (Cole, 1989; van Rensburg, Doherty and Murray, 2006; Randall and Newsome, 2009). However, the development of trails is not a straightforward process, and there can be a number of negative impacts that can hinder this development. There is evidence to suggest that some of the main issues with trail and campsite erosion can be attributed to poor trail construction and planning (Cole, 1989; Marion and Olive, 2006). When trails are poorly constructed or planned, it creates the risk of user-created trails, parallel pathways, switchbacks and trail widening (Marion and Olive, 2006; Randall and Newsome, 2008). In addition, the cost of building these trails and campsites can vary depending on the area and materials needed. Repairing trails can be costly and labour

intensive for management, which puts pressure on organisations that receive most of their funding from the government.

Depreciative behaviour has been identified as a significant impact on both users and management. Depreciative behaviour can occur in a variety of ways: antisocial behaviours such as theft and vandalism (Trafimow and Borrie, 1999) or careless actions such as littering or the incorrect disposal of human waste (Manning, 2007; Manning and Anderson, 2012). Littering and poor human waste disposal have been identified as a severe problem in many outdoor recreation areas (Civil and McNamara, 2000; Bridle and Kirkpatrick, 2003). Studies have attempted to estimate the carrying capacity of trails and campsites using the presence of litter and human waste as an indicator (Manning, 2007).

In conclusion, the negative impacts discussed thus far are only a sample of adverse effects that can occur through irresponsible outdoor recreation. These effects can be interrelated, cumulative and exceedingly costly to rectify. A noteworthy point is that most irresponsible behaviour is believed by many to be the result of irresponsible and uninformed actions rather than malicious intent (Leung and Marion, 2000; Ellis, 2005; Marion and Reid, 2007). These studies posited that uninformed and unskilled actions are the cause of many of the issues affecting land management which lead many in the field of recreational ecology to advocate the use of education as a means to mitigate these behaviours (Leung and Marion, 2000; Ellis, 2005; Marion and Reid, 2007).

2.5 Attempts to Mitigate Negative Impacts Caused by Outdoor Recreation

The United States serves as a useful example of the rapid growth in outdoor

recreation as well as the need to reduce the negative impacts on the environment. Since the late 1950s, the popularity of outdoor recreational activities such as backpacking, hiking and camping has surged in the United States (Marion and Reid, 2001). The number of visitors to US national parks in 1950 was approximately 33 million people, while the number of visitors to national parks in 2019 was over 327 million people (U.S. National Park Service, 2019). As previously discussed, there are numerous positive and negative effects associated with outdoor recreation. The growth in visitor numbers and participation has led to many recreation ecologists such as Marion and Reid (2001) arguing that the current growth is unsustainable. To mitigate adverse impacts from the irresponsible use of the outdoors, management officials around the world have employed a variety of strategies (Comhairle Na Tuaithe, 2006; Madden, 2009; The National Trails Office, 2012). This section discusses the strategies under three broad terms, namely, legislation, recreational infrastructure and education.

2.5.1 Legislation

As discussed in Section 2.4, the negative impacts can not only have drastic effects on the environment (Randall and Newsome, 2009; Pickering et al., 2010), but can also affect the experience for outdoor recreationists (Sayan et al., 2013; Lee, Jan and Huang, 2015) and result in high costs for park management, or a loss of income for landowners (Mountain Meitheal, 2003; van Rensburg, Doherty and Murray, 2006; Manning and Anderson, 2012). To mitigate these outcomes, park managers and officials have a seemingly paradoxical task of both protecting their natural resources while at the same time providing opportunities for millions of outdoor recreationists. There are two main concepts when it comes to the use of legislation: economic

incentives and regulation. These combined are sometimes known as the "carrot and stick" approach.

Economic Incentives

Economic incentives have been a somewhat successful means of engendering environmentally responsible behaviour. In developing countries, for instance, the use of financial incentives has aided in the development of eco-tourism, the use of a financial incentive can promote the cessation of environmentally harmful activities (for example, poaching, logging and clear-felling for cash crop growth) (Wunder, 2000; Kiss, 2004; Wishitemi et al., 2015). Tourism and recreational development can provide a more renewable source of income when compared to traditional land-use practices. This assumes that the development of tourism is conducted correctly, which has not always been the case (Gössling, 1999; Campbell, 1999; Tsaur, Lin and Lin, 2006; Liu et al., 2014). However, this approach has been refuted by some researchers as an inadequate solution to the problem, owing to the operational, structural and cultural problems with the development of tourism in developing countries (Das and Chatterjee, 2015).

Economic incentives have been used in Ireland to encourage landowners to allow recreationists access through their lands (Madden, 2009). The willingness to pay for formal access by recreationists was discovered as well as the price that landowners would accept in the study by Madden (2009). Although there were differences between the groups in the amount they were willing to pay for access, Madden identified a need for more collaboration and communication between landowners and recreationists in order to address this issue. Another study found that landowners were split on the provision of land for the development of greenways, with

approximately half not willing to allow a route to be developed regardless of compensation (McGurk et al., 2019). The negative impacts described in Section 2.4 continue to influence the perceptions of landowners and the development of the sector.

Another noteworthy use of economic incentives can be seen in Ireland. In 2002, to influence consumer behaviour, the Irish government introduced a €0.15 levy on plastic shopping bags. Since the introduction of the levy, a reduction of up to 90% in plastic bag consumption has been recorded (Convery, McDonnell and Ferreira, 2007). This type of intervention is discussed in more detail in Section 2.8.1.

Economic incentives have also been used in other areas, such as subsidies for electric cars, to reward consumers who purchase 'green products' (Mairesse et al., 2012). However, economic incentives alone are not a viable solution to the negative impacts caused by outdoor recreation, as the literature reveals that reputation, attitudes and social norms play an essential role in behaviour.

Regulation

If economic incentives are not enough to induce environmentally responsible behaviour, then enforcement with legal processes can be used. The United States Federal Government had previously relied solely on regulations to mitigate the negative impacts of outdoor recreation and to curb irresponsible behaviour. It now adopts a range of methods, including education, legislation and communication strategies. Regulation can be a useful measure to instil behavioural change, particularly in the short term (Wunder, 2000). Carrying capacity is an example of a regulative approach used by land management, by limiting the access of people to

an area, the potential negative impacts can be mitigated (Vorkinn, 1998; Manning, 2007; Séraphin et al., 2019). One example of enforced access regulations can be seen in regard to Machu Picchu. The pressure to introduce and enforce regulations are a result of overcrowding and disturbance of the UNESCO world heritage site (Adventure Travel Trade Association, 2018). As such, the Peruvian government have restricted entrance to the site which has now been limited to 2,500 people per day. In addition, access to the Inca trail has been restricted, at present, only 500 people, which includes support staff, are allowed to start the trail per day (Inca Trail Machu, 2020).

Social norms (see Section 2.7.6) that are widely agreed upon and accepted by society can be written into administrative rules, public policies and even laws (Manning, 2007). From an Irish perspective, the use of regulation has become important in recent years as land usage rights and access to private property continues to be a significant issue between landowners and outdoor recreationists (Comhairle Na Tuaithe, 2006; Madden, 2009; Lawless, 2018). Regulations that defend the rights of landowners and protect them from wrongful liability have been a major focal point for Comhairle Na Tuaithe (2006). However, research has shown that direct management methods such as fines, access limitations and increased surveillance and patrolling are ineffective and cause a drain on resources (Cole, 1989; Manning, 2007; Steg, Van Den Berg and De Groot, 2013), particularly for long-term behaviour change. There are several reasons why regulations are insufficient to change all irresponsible behaviours in outdoor recreation:

- Regulations can disrupt the enjoyment and experience of outdoor recreationists (Leung and Marion, 2000).
- Most negative impacts are caused by accidental or uninformed acts, not

malicious intent (Manning et al., 2002; Müllner, Linsenmair and Wikelski, 2004; Manning and Anderson, 2012).

- The cost of enforcing these regulations can put a significant amount of pressure on park managers and officials (Widman, 2010). A relevant example can be seen regarding fines for illegal dumping in Ireland or littering. It would take a massive increase in resources to enforce these policies properly.

If regulation were sufficient to mitigate irresponsible recreational behaviour, then this research would be unnecessary. For instance, there is legislation against littering in the Litter Pollution Act, which was amended by both the Waste Management Act 2001 and the Protection of the Environment Act 2003 (Litter Pollution Act, 1997; Waste Management (Amendment) Act, 2001; Protection of The Environment Act 2003). This legislation gives the responsibility to local authorities to implement and enforce the legislation. The leaving or discarding of litter in public places is an offence that is punishable under the law by an on-the-spot fine of €150 or a maximum fine of €3,000 following a conviction in the district court. There are further penalties for repeat offences.

The efficacy of this legislation was examined by the Irish environmental charity Voice of Irish Concern for the Environment (VOICE) (2019). The number of cases of littering offences between 2012 and 2017 was examined. During this period, almost 50,000 fines were issued by county councils in Ireland. This equates to an average of approximately 8,300 fines issued per year. The report indicates that the national compliance rate for paying fines is 43%, which equals around 21,310 fines. In total, 36% of fines were reported to be cancelled/disregarded or unpaid at the time the report was written (Kenny and O'Brien, 2019). County Kerry has the highest rate of unpaid fines with 68%. Furthermore, it was reported that over 6,000 cases were pursued in the court between 2012 and 2017 under the Littering Act. Of these cases,

30% were successful, with a total of €700,000 paid in fines. The report estimated that an average fine of €386 is awarded per case. Although no council has a record of the cost of prosecuting each case, estimates are given by several councils of approximately €600 per case. Therefore, not only is there a significant degree of non-compliance with paying fines, the average cost of prosecuting the case results in a deficit for the local council (Kenny and O'Brien, 2019). This is but one example of how an ineffectual regulation is unlikely to reduce irresponsible behaviours. Before the issuing of fines and prosecution even takes place, an individual has to be seen breaking the law or at least leave evidence of a crime. This would require authorities to constantly patrol the large geographical area in which outdoor recreation takes place, which is impractical for many reasons (e.g. distance to travel, equipment, training and manpower).

The use of regulation and a top-down approach to policy implementation have been met with significant pushback, particularly in Ireland (O'Leary, McCormack and Clinch, 2000; Ní Dhubháin et al., 2009; Hynes, Norton and Corless, 2014). This suggests that in the pursuit of long-term behaviour change, authorities in the future must look beyond the rational determinants of behaviour and consider communication and educational strategies.

2.5.2 Recreational Infrastructure

The sustainable development of outdoor recreation and tourism has been a significant focus of many countries' economic strategies (Nohl, 2001; Lee, 2013; Emas, 2015). These countries cite the economic and health benefits discussed in Sections 2.2.3 and 2.3.2. Sustainable development is described in the often-cited Brundtland report (1987, p.41) as "development that meets the needs of the present without

compromising the ability of future generations to meet their needs". This represents the aim of economic advancement while maintaining the long-term resource value of the environment (Bell, 2005; Manning, 2007; Wimpey and Marion, 2010). The sustainable development and maintenance of trails in national parks and protected areas is particularly relevant in Ireland in the aftermath of the case of Wall v The National Park and Wildlife Service (2017). In this case, the High Court overturned the decision made by the Circuit Court that awarded damages to Ms Wall, who injured herself while walking on a section of a trail that was in poor condition. This ruling signifies the problem with liability regarding outdoor recreation within Irish law. In addition, the ruling highlights the importance of recreationists to take responsibility for their own safety and the be aware of the possible hazards that can occur while in the outdoors (Ryan, 2003; Lawless, 2017).

Land officials and policymakers have also identified promoting the need for and efficacy of education in nature tourism as a challenge. The design of outdoor recreational facilities is an important means to protect the environment and increase the satisfaction of participants; behavioural change, however, requires more than the provision of facilities (Marion and Leung, 2004; Akbarimehr and Naghdi, 2012).

Coillte's Outdoor Recreation Plan, identifies the development of infrastructure as a critical component for the sustainable development of outdoor recreation (Coillte, 2017). Identified infrastructure includes trailheads, signage and car parks. In addition, Coillte's Outdoor Recreation Plan has identified ways to reduce nuisance/anti-social use of existing facilities. These methods include the identification and proliferation of good practice, preparation of legislative action to combat unauthorised use of recreational facilities and the development of a volunteer

ranger force to monitor behaviour and improve the recreation experience (Coillte, 2017). While a number of these actions are relatively commonplace, the volunteer ranger scheme is worthy of note.

An excellent example of the efficacy of volunteer rangers can be seen in the United States. The United States has developed an extensive volunteer program in its National Parks. In 2017, over 250,000 volunteers conducted work in parks throughout the country (U.S. National Park Service, 2020). The volunteers have a variety of skills and knowledge, and they fulfil critical roles in the day-to-day operations of the national parks. These volunteers helped mitigate some of the damage caused by park visitors during the government shutdown in the United States in 2018–19. The 2018–19 shutdown was different from previous administration shutdowns in that many national parks remained open to the public (Gibbens, 2019). The damage caused to national parks during the government shutdown was significant, this damage was mainly a result of unregulated access by recreationists, in addition to the dramatic reduction in essential staffing. The effects of these impacts on the environment can be long-lasting. Despite the labours of thousands of volunteers, the financial burden to repair the immediate damage and collect litter stripped much-needed maintenance and development funds (Gibbens, 2019). This serves as a blunt reminder of the effectiveness of both regulation and infrastructure, both strategies require intensive effort and maintenance to be effective and do not incorporate the use of personal agency. This could be the reason that, for many park management officials and governmental bodies, the development of education is seen as the most popular way in which to increase compliance with park standards.

2.5.3 Education

The promotion of environmental messages and education has become a popular tool in recreational ecology and environmental psychology (Lück and Kirstges, 2004; Manning, 2007; Madden, 2009). Numerous scholars attest that by informing the public and providing education, the opportunity for behavioural change increases (Christensen and Cole, 2000; Jensen, 2002; Marion and Reid, 2007). The benefit of using education is that it provides the individual with the knowledge and skills for determining the correct course of action and, therefore, may lead to responsible behaviour. As discussed in Section 2.4, a significant proportion of negative impacts on the environment arise from careless or unskilled actions rather than malicious intent (Ellis, 2005; Manning, 2007; Manning and Anderson, 2012; Taff et al., 2014). Furthermore, the popularity of promoting environmental messages and education in national parks and protected areas could be due to the low cost of the promotion compared to the enforcing of regulations (see Section 2.5.1). In addition, the unobtrusive nature of promotional and educational messages might impede less on the experiential satisfaction of visitors (Jones and Bruyere, 2004; Bell, 2005).

An excellent example of the use of education to promote responsible outdoor recreation would be to examine efforts made in Scandinavian countries (Gelter, 2000). In Scandinavian countries, the outdoor lifestyle of *friluftsliv* and its philosophical implications affect many facets of everyday life, including environmental education (Gelter, 2000). According to Gelter (2000), *friluftsliv* "translates to 'free air life' meaning a philosophical lifestyle based on experiences of the freedom in nature and the spiritual connectedness with the landscape". For these countries, *friluftsliv* is not seen as formal education. However, it involves learning

"the ways of yourself and the place in the more than human world and learning the ways of every creature and phenomenon you meet on your journey through life" (Gelter, 2000, p.90). Outdoor education is seen to enrich and deepen the understanding of *friluftsliv*.

The challenges and implications facing Scandinavian countries are entirely different from other regions as these countries contain a high proportion of forested regions (up to 70%) (Bell et al., 2007). This phenomenon is coupled with a tradition of "allemansrätten" (everyman's right), which allows free access to all outdoor recreational areas and lands except specific agricultural areas and is considered of vital importance by the population (Gelter, 2000; Bjerke, Thrane and Kleiven, 2006; Bell et al., 2007). For this region, the main issue that policymakers and land managers have is the conflict between the forestry industry and recreation (Bell et al., 2007). These conflicts can include the handling of large clear-cuts and road construction through heavily forested areas which can impede and impact access to recreational trails. As such, the management in this region has to address this issue with a less restrictive approach such as information, signposting and guided tours, which emphasise ways to reduce the impact of visitors on the environment (Gelter, 2000; Jenkins and Pigram, 2005). Furthermore, due to the custom and practice of automatic free access, restrictions or visitor fees would be deemed unfeasible.

The United States has also moved, particularly in recent decades, to a less intrusive educational approach to land management; however, the use of regulation and enforcement still exists. The United States Forest Service developed educational messages for outdoor recreation in the 1970s that advocated personal responsibility and education at high use areas. This method, which used information and advice,

received initial support from land management and evolved during the 1980s into a more formal ethics programme designed to provide information on outdoor recreation and land practices (Marion and Reid, 2001). This led to the creation of the National Outdoor Learning School, which focused on the teaching of outdoors skills and leadership in the backcountry. The later development of the separate Leave No Trace ethics programme sought to educate outdoor recreationists about best practices for minimum impact recreation through straightforward and adaptable means. The origins of Leave No Trace are discussed in Section 2.6.

In summary, the three broad strategies (legislation, infrastructure and education) used for the promotion of environmentally responsible behaviours each have inherent strengths and weaknesses. Selecting the most appropriate method or a mix of methods requires a significant amount of knowledge of sociological and cultural aspects of the target audience. Although each method is different, a concurrent theme between each strategy is the importance of effective communication efforts to successfully implement strategies and increase compliance (Rimal and Real, 2003; Marion and Reid, 2007; Lee, Jan and Yang, 2013; Burger and Caputo, 2015).

2.5.4 Barriers to Environmentally Responsible Behaviour

When discussing the factors that influence environmentally responsible behaviour, it is vital to examine the barriers that that can prevent these behaviours from taking place (Blake, 1999; Kollmuss and Agyeman, 2002). Barriers to environmentally responsible behaviour can be especially influential on people who do not have a strong environmental concern. However, even with a pro-environmental attitude, there is still an attitude-behaviour gap regarding the performance of environmentally responsible behaviour, which has been discussed in the literature (Blake, 1999;

Kollmuss and Agyeman, 2002; Juvan and Dolnicar, 2014; Higham, Reis and Cohen, 2015). This suggests that external factors can have a significant influence that supersedes personal environmental concern. This section discusses under two headings, the possible barriers to the implementation of behavioural change strategies, in particular, environmentally responsible behaviour.

Economics

One of the most common obstacles to performing environmentally responsible behaviour is economics (Brown and Peterson, 1994). Generally speaking, performing environmentally responsible behaviours can be more expensive in terms of money and effort (Kollmuss and Agyeman, 2002). For example, in developing countries, local communities possess a positive attitude towards environmentally responsible behaviour, yet the majority of their livelihood comes from the exploitation of natural resources (Gössling, 1999; Cawley, Bicalho and Laurrens, 2013). The fight for survival is a daily occurrence in some cases, and a significant proportion of fuels for heating and cooking, as well as the food itself, comes from trespassing on protected areas (Youdelis, 2013). To compare this to an Irish perspective, the perceived cost of purchasing sustainable products or adopting green behaviours can be an economic barrier to behavioural change (Lavelle, Rau and Fahy, 2015). In addition, the perceived value in proper waste disposal and recycling can be a barrier to the performance of a behaviour (Kelly et al., 2004). Furthermore, if the performing of environmentally responsible behaviours is regarded as too physically taxing (see Section 2.7.6), the willingness to comply with environmentally responsible behaviour can be reduced (Kollmuss and Agyeman, 2002).

Communication

The way in which recommendations for environmentally responsible behaviour are communicated can also be a barrier (Harding, Borrie and Cole, 2000; Brownlee et al., 2013). It has been suggested that engagement with local populations to encourage a sense of ownership and personal responsibility can be a significant determinant regarding the uptake of environmentally responsible behaviours (Youdelis, 2013; Chiu, Lee and Chen, 2014; Das and Chatterjee, 2015). Research has suggested that a top-down approach to encouraging environmentally responsible behaviour can negatively affect adherence in target communities, even from those who might have strong pro-environmental beliefs and attitudes (Campbell, 1999; O'Leary, McCormack and Clinch, 2000; Wilson et al., 2005). This is of interest from an Irish perspective as communication strategies for the promotion of environmentally responsible behaviours are often adopted from other countries. As indicated in Section 2.4, there are significant differences in attitudes and culture between different countries and the application of behavioural change strategies without prior consideration of the target population can severely hinder its success (Campbell, 1999; Cawley, Bicalho and Laurrens, 2013).

2.6 Leave No Trace

Given the growth in tourism and outdoor recreation and the potential negative impacts associated with this, strategies are needed to sustainably develop the sector. These should be adaptable to different environments and implemented using innovative communication techniques that will increase cooperation from local communities. Leave No Trace Ireland is an organisation that can accommodate this development.

Leave No Trace (LNT) Ireland is an environmental charity dedicated to the education and improvement of minimal impact outdoor recreation practises. Its mission is to "inspire the responsible use of the outdoors through education, research and partnerships" (Leave No Trace Ireland, 2016a). It teaches people how to enjoy the outdoors responsibly (Leave No Trace Ireland, 2016a). This section discusses the origins of LNT, the principles of LNT, the methods used by LNT and the challenges facing LNT in Ireland.

2.6.1 The Origins of Leave No Trace

Leave No Trace can trace its origins back to the United States of America in the 1960s when the United States Forest Service published a "no trace" programme, which emphasised sustainable travelling and camping etiquette and good practices. The success of this campaign led to co-operation between the forest service and national parks to create a new pamphlet titled *Leave No Trace Land Ethics* (Marion and Reid, 2001). Furthermore, in the early 1990s, the Forest Service worked in conjunction with the National Outdoor Leadership School (NOLS) to develop an interactive, research-based, minimum impact education training for "non-motorised recreational activities" (Marion and Reid, 2001). A 1993 summit of the United States Forest Service, outdoor industry bodies, NOLS, non-profit organisations, outdoor manufacturers and federal land management agencies resulted in the creation of an independent, not-for-profit organisation called Leave No Trace. One of the most important aspects of its popularity is suggested to be the applicability of the Leave No Trace principles, which is discussed later (Christensen and Cole, 2000; Marion and Reid, 2001). As stated in previous sections, the variety of environments in which outdoor recreational activities can take place, coupled with the range of activities that

can occur using the same area, means that an educational strategy must be highly adaptable. This is particularly useful in areas to which access is limited, otherwise known as backcountry recreation (Cole, 1989; Harding, Borrie and Cole, 2000; Vagias et al., 2014). In the backcountry, trail and facility maintenance and waste disposal by land management is severely limited, which means that irresponsible behaviour has a higher chance of long-lasting effects.

2.6.2 Principles of Leave No Trace Ireland

Leave No Trace Ireland promotes minimal impact outdoor recreational practises through a variety of mediums. Leave No Trace Ireland aims to arm people with the knowledge of what impacts can occur when the wrong behaviours are carried out and believes that a change in attitude in how people see their interaction with the natural environment can modify the way people use it.

Leave No Trace Ireland has developed a programme designed to educate people in minimum impact techniques so that humans can continue to enjoy the natural world for future generations. This has led to the development of the seven key principles of Leave No Trace Ireland (Leave No Trace Ireland, 2016a). These principles are:

- Plan Ahead and Prepare
- Be Considerate of Others
- Respect Farm Animals and Wildlife
- Travel and Camp on Durable Ground
- Leave What You Find
- Dispose of Waste Properly
- Minimise the Effects of Fire

The original seven principles that were developed for the Leave No Trace

programme in the United States were altered when brought to Ireland. The respecting wildlife principle was changed to include farm animals in order to account for the level of outdoor recreation that occurs on private lands in Ireland, as discussed in Section 2.3. These principles have been developed as a result of numerous studies into the negative impacts associated with careless or uninformed behaviours of outdoor recreation enthusiasts (Manning et al., 2002; Müllner, Linsenmair and Wikelski, 2004; Manning and Anderson, 2012). The application of these seven principles has been adopted and reviewed by scholars and adopted by land management officials throughout the United States and in other countries, including Ireland (Marion and Reid, 2001; Comhairle Na Tuaithe, 2006; Manning and Anderson, 2012). Many of the principles of Leave No Trace can be seen as common sense. For instance, "Leave what you find" is effectively promoting the message of not modifying the environment or the taking of souvenirs. Many of the negative impacts described earlier in this chapter involve the seven principles of Leave No Trace. Leave No Trace Ireland also promotes responsible recreation in regard to other people with the principle "be considerate of others". Leave No Trace has become widely accepted as a popular, common sense and uncontroversial environmental ethic and has been rolled out as a code of practice for a number of countries such as the United States, Canada, Ireland, Australia and New Zealand (Simon and Alagona, 2009).

2.6.3 Methods used by Leave No Trace Ireland

Despite criticism regarding the strength of education as a predictor of behaviour (Oates and McDonald, 2014), education is one of the most popular means of promoting environmentally responsible behaviour in outdoor recreationists (Dyck et

al., 2003; Meyer, 2010; Serenari, Bosak and Attarian, 2013). One of the main methods through which Leave No Trace Ireland promotes responsible outdoor recreation is through a three-tiered training structure.

The three-tiered structure is used as a means of promoting the Leave No Trace Ireland message of relevant knowledge and skill levels to interested parties in relation to outdoor education. The Awareness Course, which is the lowest tier, is a workshop designed for and tailored to a variety of audiences such as educators, college students, professionals and children. The workshop involves introductory training into LNT ethics and skills and is coordinated by either an LNT Advanced Trainer or an LNT Trainer. The Trainer course, which is the second tier, is a less intense version of the Advanced Trainer Course. It seeks to develop skills already taught in the previous awareness course, making it a vital component of the LNT nationwide programme. It is designed for educators, guides, agency employees and other outdoor professionals and, upon successful completion, graduates can run and teach tier-one LNT awareness workshops. The Advanced Trainer Course is the top tier of the pyramid, and it is a comprehensive five-day training course teaching and developing backcountry LNT principles. It is designed for people who are actively teaching backcountry skills or providing recreation information to the public. Upon completion, advanced trainers can run the second-tier Trainer Courses.

Figure 2.1 Three tier training structure of Leave No Trace Ireland, adapted from (Leave No Trace Ireland, 2016a)

Leave No Trace Ireland develops and delivers many of its courses in environmental education using a method known as active learning. Active learning is generally defined by Prince (2004, p.223) as "any instructional method that engages students in the learning process. In short, active learning requires students to do meaningful learning activities and think about what they are doing". The belief for the use of active learning is that by focusing on participation, the possibility of communication, engagement, and knowledge retention can be increased (Prince, 2004). In addition, active learning allows for self-reflection and personalisation of the topics (Derevenskaia, 2014; Torkar, 2014; Freeman et al., 2014; Kuščer and Mihalič, 2019). There is growing support for the use of active learning and this has been documented in the literature (Couchman, 2011; Freeman et al., 2014; Torkar, 2014; Derevenskaia, 2014; Kuščer and Mihalič, 2019).

In addition to the three-tiered training structure, Leave No Trace Ireland is committed to working with educators and has developed a selection of programmes to create awareness of Leave No Trace Ireland specifically for young audiences. There are

several school and young peoples' programmes which have been developed by Leave No Trace in Partnership with a number of organisations, these include:

- The Explorers Education Programme which provides fun lesson plans, resources and activities for primary school teachers to inspire their student's interest and knowledge in our ocean, marine environment, species, and seashores. The Explorers Education Programme is supported by the Marine Institute and is funded under the Marine Research Programme by the Irish Government.

- The Leave No Trace schools programme is a curriculum intended to promote sustainable use of our public lands, through the application of the seven principles of Leave No Trace. There is also an online, interactive resource available for use.

- The Learning about Forests Programme is run by the Environmental Education Unit of An Taisce in partnership with Leave No Trace Ireland. Through interactive learning and field trips, the programme aims to reconnect the young people with their environment, educating them to be more conscious of protecting it and instilling a sense of ownership of the natural world.

- Leave No Trace Ireland has developed a small, community-led initiative in Co. Donegal. It is the first of its kind in Ireland and will support outdoor recreational groups and communities by providing them with a series of free custom educational training workshops as well as resources to enable them to protect, preserve and enhance responsible outdoor recreation in Donegal's upland, coastal and inland environments.

2.6.4 Leave No Trace in Ireland and Challenges for the Future

In 2004, an ad hoc committee was established to progress the idea of establishing Leave No Trace in Ireland. The committee consisted of the Countryside Access and

Activities Network, Duke of Edinburgh Award Scheme, Coillte, National Parks and Wildlife Service, the Forest Service, the Heritage Council, Irish Uplands Forum, Mountaineering Council of Ireland, Mountain Meitheal, Scouting Ireland and the President's Award (Leave No Trace Ireland, 2016a). It was decided that Leave No Trace employed the most relevant message and the most appropriate and adaptable policies. Thus, in September 2006, Leave No Trace was officially launched in Ireland. Since its official launch, Leave No Trace has been supported and endorsed by a growing number of Irish companies and state bodies.

Leave No Trace Ireland promotes itself through research, partnerships and education. To this end, Leave No Trace has sought partnerships and collaboration with both state and non-governmental organisations including Coillte; Fáilte Ireland; the Irish Sports Council; the National Trails Office; and Waterways Ireland. Additionally, Leave No Trace Ireland works with schools through outdoor classrooms and promoting responsible recreation to a new generation of students. A new campaign has been developed, which is allowing Leave No Trace Ireland to help businesses take action and protect the environment. From creating simple habitats to financing restoration projects, arranging clean ups and educational workshops, the private sector is realising the value of nature (Leave No Trace Ireland, 2019). Leave No Trace Ireland raises awareness with employees around protecting our environment and responsible outdoor recreation.

Leave No Trace Ireland has developed a strategic plan with its organisational partners, which covers the period 2016 to 2021. The strategic plan details several objectives that are currently underway, including the creation of educational messages, the development of research initiatives, the growth of Leave No Trace, the

development of networks and the sustainable development of outdoor recreation and tourism (Leave No Trace Ireland, 2016b).

Despite previous success in the United States (Marion and Reid, 2001), Leave No Trace Ireland is not without its challenges. A noteworthy challenge for Leave No Trace Ireland is the scarcity of relevant literature on the attitudes and behaviours of outdoor recreationists from an Irish perspective. Much of the literature on Leave No Trace and the efficacy of educational strategies comes from its country of origin, that is, the United States. The cultural differences between these two countries could act as a substantial barrier to the implementation of the strategies in Ireland. As stated in previous sections, applying land management strategies without prior knowledge of the local culture and customs has hindered the development of ecotourism and educational strategies in other countries (Gössling, 1999; Serenari, Bosak and Attarian, 2013; Imran, Alam and Beaumont, 2014). Although there has been a growth in pro-environmental attitudes in Ireland (Kelly et al., 2004), as of yet, there has not been any notable research into the attitudes and behaviours of outdoor recreationists.

2.7 Behaviour

The behaviours of people in their day-to-day lives can have significant and severe impacts on their lives in a number of ways (for example, health and well-being). In addition, an individual's behaviour can affect other people and groups or organisations to which they belong (Fishbein and Ajzen, 2010). There is a growing consensus among social science researchers that human behaviour accounts for both the cause and possible solution to many of the social issues that affect modern society (for example, racism, health, discrimination, environmental degradation and industry

productivity) (Ajzen and Albarracin, 2007; Fishbein and Ajzen, 2010). The following sections examine some of the most prominent and most used theories in the field of behavioural change. As the previous attempts to mitigate negative impacts have not conclusively addressed the issue, it is essential that the determinants of behavioural intentions are investigated to explain why that is the case.

2.7.1 Theories of Behavioural Change

Attempting to examine and explain behaviour is not a new concept to social science. In fact, a range of theories and frameworks have been developed, and their merits have been debated by scholars for decades (Bandura, 1999; Martin, 2004; Bandura, 2005).

One of the core objectives of this research is to evaluate and critique the efficacy of behavioural change theories and strategies. Behaviour is defined as the way in which a person behaves in response to a situation or stimulus. The determinants of human behaviour has been the focus of many studies across numerous disciplines (Smith et al., 2008; Clark, 2010; Imran, Alam and Beaumont, 2014). Regarding recreation ecology, the behaviours of individuals engaging in outdoor recreation have been the focus of a limited number of studies in the United States and other countries (Pigram and Jenkins, 2005; Steg, Van Den Berg and De Groot, 2013). People from different countries and different cultures have been shown to perform different behaviours in dealing with nature, particularly in the use of environmentally responsible behaviour (Biel and Thøgersen, 2007; Lee, Jan and Yang, 2013). Scholars have also theorised that there is a multitude of factors that can influence an individual's behaviour, such as knowledge (Kollmuss and Agyeman, 2002), age and gender (Ajzen, 2001).

This section examines the incorporation of theory into intervention design and consider three well-known theories of behavioural change and their use in behaviour change interventions. The three theories examined are:

- the transtheoretical model of change
- social cognitive theory
- the theory of planned behaviour.

2.7.2 The Use of Theory-Based Interventions

For a long time, many attempts made in social science to change behaviour were context-specific, that is, the intervention was only applicable to a particular behaviour (Bandura, 1997a; Webb and Sheeran, 2006; Abraham and Michie, 2008). Furthermore, the dissemination and replication of research were difficult as there was a lack of information on the process through which the intervention was enacted. While domain-specific research still occurs today for a number of reasons, the majority of recent research conducted demonstrates the benefits of applying theory and theoretical based frameworks to interventions, which can increase their effectiveness (Michie, van Stralen and West, 2011; Jacobs et al., 2011; Hasking, Boyes and Mullan, 2015).

The question as to how a theory is used in the design of a behavioural intervention has become a topic of debate among researchers. A review of meta-analysis studies indicated several ways in which behavioural researchers have classified the application of theory (Smith and Hitt, 2005; Webb and Sheeran, 2006; Stacey et al., 2015). These are outlined below:

- Informed by a theory: Some studies identify a theoretical framework as the basis of their research question. However, there is limited, or no application of the identified theory used in the research (Michie and Prestwich, 2010).

- Applied theory: A specific theoretical construct was identified, and several of the theory's aspects were incorporated into the study (Cane, O'Connor and Michie, 2012; Hsueh, 2015).

- Tested theory: A theoretical framework has been specified, and a majority of the components of the theory are measured and tested. Alternatively, two or more theories are compared to examine similarities and test if results contrast between theories (Creswell, 2013; Neuman, 2013; Dolan and Galizzi, 2015).

- Theory creation: A new or revised theory is developed using proposed constructs or aspects; these proposed aspects are analysed in the study.

Despite the number of studies that claim their interventions are theory-based, there is a growing concern from scholars about the validity of such claims (Michie and Prestwich, 2010; Cane, O'Connor and Michie, 2012; Davis et al., 2015). Questions have been raised about the level to which theory influences the development of an intervention or merely pays lip-service to the theory to appear more academic and robust (Michie and Prestwich, 2010). Furthermore, and equally worrying, is the adoption of a particular theory based solely on its popularity instead of its applicability (Michie and Prestwich, 2010). This may result in the development of interventions that are not fit for purpose, which might also hinder the promotion of more relevant frameworks that were overlooked based on academic popularity (Whitelaw et al., 2000; Sutton, 2001; Brug et al., 2005).

A significant criticism noted in numerous studies of theory-based interventions, which is discussed in the following sections, concerns the lack of significant empirical evidence to support the use of theory-based intervention design (Webb and Sheeran, 2006; Young et al., 2014; Prestwich et al., 2014; Stacey et al., 2015). When conducting an analysis of a theoretical framework, it is important to consider how a framework should be critiqued. Many critics of the popular theories described below

focus their critique on the empirical evidence of research papers and the success of interventions (Williams, Anderson and Winett, 2005; Smith and Hitt, 2005; Webb and Sheeran, 2006); others argue that validity and robustness are core components to the evaluation of a theory-based intervention. More specifically, it should be considered whether a theory-based intervention works better than non-theory based intervention (Smith and Hitt, 2005; Webb and Sheeran, 2006; Godin et al., 2008).

Another consideration is the need for replication in research. A theory-based intervention, no matter how impressive the results, must be able to be replicated by other researchers, otherwise the intervention is inviting condemnation and dismissal (Abraham and Michie, 2008; Michie et al., 2015). While many studies indicate that interventions are theory-based, a common occurrence is a lack of justification and details of how an intervention is designed (Abraham and Michie, 2008; Prestwich et al., 2014).

There needs to be a clear and logical argument for the use of behavioural theory in an intervention design that, at the very least, demonstrates the aptitude of the researcher in using such a framework. Applying blind faith to a popular framework is not only academically unsound but hinders the development of robust behavioural interventions and social change (Michie and Prestwich, 2010; Baumeister and Bushman, 2013; Davis et al., 2015).

2.7.3 Evolving Theories of Behaviour Change

The following sections examine each of the chosen behavioural theories separately and discuss the academic consensus on the use of such theories in the design of behaviour interventions. These behavioural theories were chosen as they have

achieved a high level of renown across numerous disciplines as well as their potential applicability to this research. There is a significant amount of both supportive and critical research related to each theory. Furthermore, each of the theories has been applied in the design of many behavioural interventions.

2.7.4 The Transtheoretical Model of Change (Prochaska and DiClemente, 1982)

The transtheoretical model (TTM) is incorporated into a large body of work aiming to induce behavioural change regarding health. Health science is a significant source of behavioural change research, and several theory-based interventions have been conducted and evaluated. Behavioural change in health science often aims to increase or reduce certain behaviours (for example, smoking, drinking, and weight reduction). The TTM proposes that long-term changes to people's behaviour in relation to health can involve multiple actions and adaptions over time (Prochaska and DiClemente, 1982). The TTM posits that some people are not yet ready to attempt changing their behaviour, while others have already begun implementing changes in their lifestyle (for example, quitting smoking and going on a diet). A core element of the TTM includes the idea of "stages of change". The stages of change reflect how different people in a population can be at different stages in their readiness to adopt new behaviours (Ma et al., 2015). Since its emergence in the 1980s, the TTM has been examined and tested primarily in the health sciences but has also been used in a range of other disciplines, e.g. (Hulton, 2001; Kidd et al., 2003; Cane, O'Connor and Michie, 2012; Oinas-Kukkonen, 2013; Davis et al., 2015).

Aspects of the Transtheoretical Model of Change

The TTM is based on a heuristic model that is best examined as a sequence of steps. These steps are cyclical and can be useful in understanding why some people might not be prepared to attempt behavioural change (see Figure 2.2).

As illustrated in Figure 2.2, the TTM has five main stages of behavioural change:

1. Pre-contemplation, in which there is no evidence of either need or interest in behaviour change
2. Contemplation, which occurs when a person is thinking about making a change
3. Preparation, which is when the person is planning to change their behaviour
4. Action, which is the stage when the person has changed their behaviour or adopted a new habit, for example, has begun dieting and exercise
5. Maintenance, which is where the ongoing practice of the new behaviour occurs.

For each stage of the TTM (pre-contemplation, contemplation, preparation, action and maintenance), there are prescribed "treatments" tailored to the characteristics of that stage (Prochaska and DiClemente, 1982; Prochaska, DiClemente and Norcross, 1993). For instance, a person in the pre-contemplation stage of an intervention is unaware that there is a problem or does not care about the problem, and there is no intention to change behaviour. Prochaska (1993, p.1103) illustrated this by using a quote from G.K Chesterton "It isn't that they can't see the solution. It is that they can't see the problem". As such, interventions for people at the pre-contemplation stage should focus on raising awareness and concern for the impact of their actions.
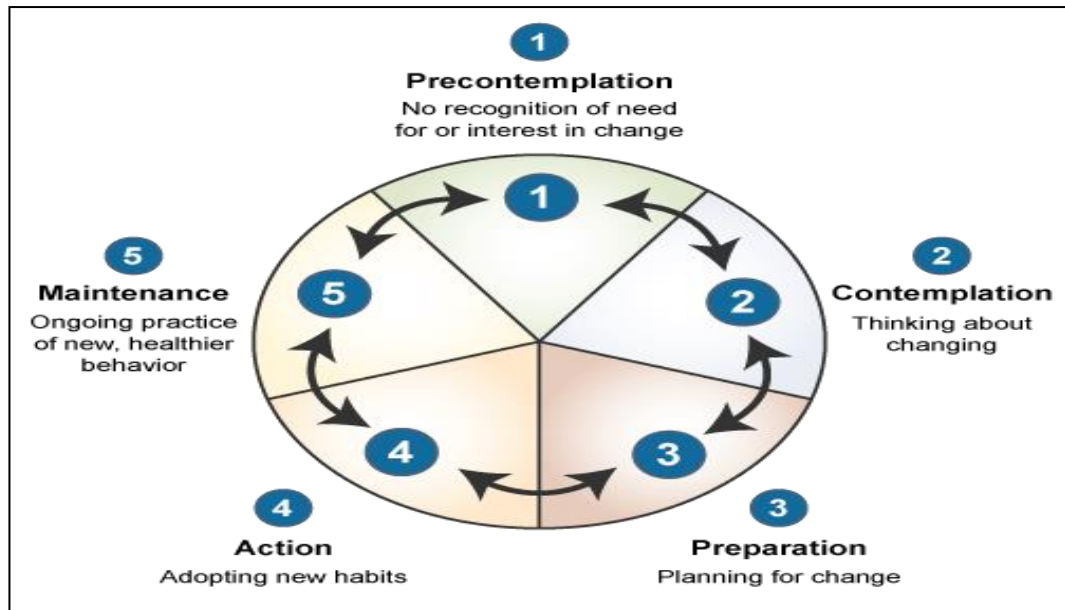
Figure 2.2 A transtheoretical model for behaviour change (Prochaska and DiClemente, 1982)

An essential aspect of the TTM is that a person does not necessarily progress through the stages of change in a linear fashion, as illustrated by the double-ended arrows (Prochaska and DiClemente, 1982). This is particularly relevant to health research in areas such as substance abuse, where individuals may relapse and revert back to an earlier stage (Kidd et al., 2003; Nidecker et al., 2008; Ma et al., 2015). As stated previously, the TTM has been applied to several behavioural interventions. Although it is not the only "stage-based" intervention to behaviour, it has become one of the most dominant (Brug et al., 2005; Adams and White, 2005; Davis et al., 2015). However, there have been several concerns raised about the efficacy of the TTM.

Criticism of the Transtheoretical Model of Change

Despite its evident popularity as a means of inducing behaviour change in the health sciences as well as its appreciation of the effect of time on the intention to perform behaviours, there have been a number of studies which question the rigour and evidence upon which the TTM has received its laurels. A notable example is Whitelaw, et al. (2000), who indicated that the popularity and adoption of the TTM

is surprising considering the paucity of empirical evidence of the model's effectiveness. As mentioned earlier, there is significant concern regarding the use of the TTM and labelling of an intervention as a success (Brug et al., 2005; Friman, Huck and Olsson, 2017). The way in which a study infers whether an intervention was successful could simply imply that the participant had "progressed" to the next stage of the model, although this would be difficult to measure depending on the study. For instance, a paper by Hulton (2001) indicated that the use of a TTM-based model helped in the categorisation of adolescents into the "stage" they were at in relation to making decisions about sexual intercourse. Hulton proposed that by utilising the TTM, the opportunity to provide relevant interventions to induce the desired behaviour (for example, providing non-virgins with decision-making skills in order to choose abstinence) was increased. To indicate that a study was a success based on factors such as these raises some concerns. Hulton points out some limitations to this study in terms of sample size, the use of self-reports and the need for more longitudinal research in this topic to investigate if the interventions continue to be successful over time. Without substantial long-term evidence of the model's efficacy, a precautionary approach is advised by several researchers (Sutton, 2001; Kidd et al., 2003; Brug et al., 2005; Davis et al., 2015).

In using the TTM, or indeed any stages of change model, it is necessary to use a variety of algorithms in order to allocate people into their respective stages correctly. Unfortunately, there has not yet been the adoption of a "gold standard" for the choice of staging algorithm (Brug et al., 2005). This, according to Brug, et al. (2005, p.245) has enabled "many researchers to feel free to adapt and change existing algorithms when they are not comfortable with the original measure".

A serious question that needs to be asked is whether this freedom to choose staging algorithms can harshly affect the validity and reliability of the TTM, which has further implications considering that for much of social science and health research self-assessment has become a crucial and popular method of conducting research (Abraham and Michie, 2008; Davis et al., 2015). Perhaps the most serious drawback to using self-reports could be the misconceptions about a person's actual behaviour (Brug et al., 2005). This is of particular interest in respect to irresponsible behaviours in the outdoors as numerous studies have identified unaware and unintentional actions as a major cause of negative impacts related to outdoor recreation (Isaacs, 2000; Leung and Marion, 2000; Manning, 2007; Taff et al., 2014).

Scholars continue with this trend by discussing the temporal effect of the TTM. Some scholars suggest that the TTM is a short-term behavioural model and, as such, does little to help in the design of interventions for long-term behavioural change (Adams and White, 2005; Brug et al., 2005). This is a significant concern from the perspective of this research: many of the environmental impacts resulting from outdoor recreation are not in themselves instantaneous or isolated; instead, many of the impacts are cumulative and can occur over long spaces of time (Covingtion and Debano, 1993; Knight and Gutzwiller, 1995; Marion and Reid, 2007). To date, there appears to be a dearth of relevant empirical evidence and research that illustrates the long-term use of the TTM to change behaviour (Brug et al., 2005; Adams and White, 2005; Davis et al., 2015; Friman, Huck and Olsson, 2017).

As previously discussed, several studies have focused on using the TTM to design interventions based on physical activity (Whitelaw et al., 2000; Godin et al., 2004; Ogilvie et al., 2011). The decision to engage in a physical activity using a countryside

walk, for example, is not a singular behaviour; instead, it could be seen as a series of behaviours which are entwined and dependent on a large number of factors (travel, time, cost and skills) (Jeon, Kim and Heo, 2014). It could be said that relying on the TTM as a means to change a complex matrix of behaviours is a potential oversight during the intervention design process, especially if choosing to implement a model due to its popularity and intuitive appeal (Whitelaw et al., 2000; Sutton, 2001; West, 2005).

The issue of complexity is exacerbated when we examine the range and variability of activities (for example, walking, hiking and dog-walking) that are classified as outdoor recreation as well as the range of geographical contexts in which these activities can take place (for example, mountains and grasslands). Each of these activities can cause environmental impacts of different varieties and scales. In fact, several studies examine the conflict between recreational groups in order to establish if some activities are more harmful than others (Watson, Williams and Daigle, 1991; Pickering et al., 2010). Given the complex nature of outdoor recreational behaviours and the many factors and theories that have attempted to account for these behaviours, to solely rely on the TTM as a foundation to develop interventions aimed at changing recreational behaviour would appear to be too simplistic.

Several scholars have criticised the TTM for oversimplification in relation to the determinants of behaviour (Adams and White, 2005; Brug et al., 2005; Friman, Huck and Olsson, 2017). As discussed previously, the multitude of variables that can influence our behaviours is inexorably complex. While trying to account for every possible eventuality in predicting behaviour would be impossible, there are some critics who believe that the TTM is, at best, suited to determining current behaviour

rather than predicting it (Brug et al., 2005).

In conclusion, the TTM provides significant and valuable insight into the effect of time and the possible influence of habit and past behaviour. Despite the popularity of this theory and its prevalence in the field of health science, without more empirical evidence of long-term behavioural change, caution must be applied in the incorporation of this model in behavioural interventions.

2.7.5 Social Cognitive Theory (Bandura, 1999)

Social cognitive theory (SCT), which can be viewed as the successor to Bandura's social learning theory (Bandura, 1997b), considers human behaviour in terms of a three-way, reciprocal model with continuous interactions between personal factors, environmental influences and behaviour (Bandura, 1977, 1986, 1997b, 1999, 2005). SCT can be viewed as an amalgamation of concepts and progressions found in behaviouristic, emotional and cognitive models of behaviour change (Bandura, 2001a).

Given its far-spreading lineage, the SCT framework has been applied to many interventions across numerous disciplines (Bandura, 2002, 2004; Gibson, 2004; Young et al., 2014).

• Outcome expectations

Behavioural Factors

• Knowledge
• Goal
• Self-efficacy

Personal Factors/Cognative Factors

Environmental Factors

• Social support/barriers

• Performance accomplishments
• Vicarious experience
• Verbal persuasion
• Physiological states
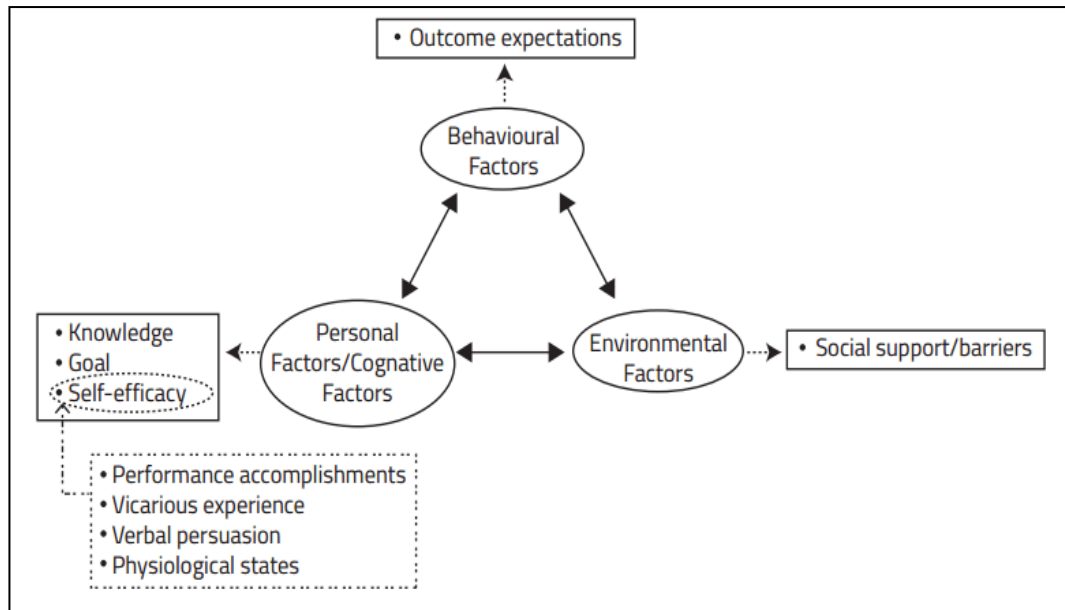
Figure 2.3 Social cognitive theory (Bandura, 2005)

Aspects of Social Cognitive Theory

Social cognitive theory postulates that the motivators of behavioural intentions stem from three factors. As illustrated in Figure 2.3, the three main factors influencing behavioural intention are:

- Personal Factors
- Behavioural Factors
- Environmental Factors

The personal factors of SCT examine behaviour from an agentic perspective. The agentic perspective postulates that human beings are self-organising, proactive, self-regulating and self-reflecting (Bandura, 2005). This relates to Bandura's ideation on the concept of self-efficacy which is viewed as the perceived control a person has on their behaviour or life (Bandura, 1998, 2001a). Additionally, human behaviours are rooted in social structures. Aspects of a society's culture, religion, customs, languages etc. can all play a significant role in the promotion of behaviour (Bandura, 2002; Smith and Hitt, 2005). To be an "agent" of change, as described by Bandura (2002, p.270) is to "intentionally influence one's functioning and life circumstance".

The following section examines what Bandura shows to be important in the creation of "agency" or the promotion of perceived self-efficacy (Bandura, 2001a).

Humans are known to form intentions to perform a behaviour (Bandura, 2002; West, 2005; Young et al., 2014). These intentions range from schedule or calendar appointments to New Year's resolutions. Unfortunately for behavioural scientists, intentionality is not the only influence on human behaviour. There is no absolute influencer regarding human behaviour. Instead, human behaviours can be made of a myriad of influences of varying degrees of importance (Sjögren, Hansson and Stjernberg, 2011; Sayan et al., 2013).

The second component of human agency in the SCT is known as forethought, listed as 'goals' in Figure 2.3 (Bandura, 2001a). As previously discussed, people are known to create plans and schedules. The purpose of plans is usually the fulfilment of goals and objectives (Bandura, 2004; Greaves et al., 2011; Young et al., 2014). Forethought, therefore, could be the incorporation of a temporal aspect towards the motivation to perform a behaviour. An example could be a woman who goes on a diet in order to better fit into her wedding dress. The compelling aspect of forethought is that the future cannot physically be a cause of behaviours in the present due to its non-existence. However, through cognitive engagement, anticipated or desired futures are brought in as influencers towards current behaviours. In tune with the idea of temporal influences of human behaviour, a quote by author Mitch Albom (2012) expresses man's fascination with time: "Man alone measures time, Man alone chimes the hour. And, because of this, man alone suffers a paralyzing fear that no other creature endures. A fear of time running out". While Albom's take on man's enslavement to time is negative, the ability to change behaviours in the present in

order to achieve complex or difficult goals can provide purpose, structure and meaning to a person's life. This is illustrated by Confucius, who stated: "The man who moves a mountain begins by carrying away small stones". Simply put, a person who has created their plans and identified their goals cannot simply cease and await the desired outcomes, behaviour change involves more than just motivation or desire (Bandura, 2001a). It requires the identification of the correct course of action as well as the motivation to perform the desired behaviours and to regulate what behaviour is performed (Bandura, 2001a). This concept is essential in the design of interventions.

While motivation and goal setting are important components in influencing behaviour change, if a person is unable to identify the steps that need to be taken in order to achieve the desired effect, then it can severely hinder the efficacy of the intervention. This is one of the reasons why it has been the policy of several non-governmental organisations such as Leave No Trace to use education to foster environmental concern while also equipping people with the knowledge and skills so that they can perform the desired behaviour effectively (Reid and Marion, 2003; Marion and Reid, 2007; Vagias, 2009; Foo, 2013).

The behavioural factor of SCT argues that human behaviour is not seen as an isolated or static phenomenon. People can be seen as evaluators of their own behaviour (Bandura, 1998; Martin, 2004; Kurz et al., 2015). People are continually engaging with different forms of self-awareness: they examine the consequences of their behaviour and how it has not only impacted their lives but the lives of those around them (Gibson, 2004; Godin et al., 2008; Berry et al., 2011). By doing so, they can evaluate the soundness of their beliefs and actions and the justification of their goals,

and they are able to adjust these beliefs and actions if necessary (Bandura, 1986, 2001a, 2005). A human's ability to learn from past behaviour and the effect of past behaviour on future actions has become an interesting avenue of research in recent years (Cole et al., 2006; Kurz et al., 2015; Lavelle and Fahy, 2016).

The environmental factor of SCT posits that human behaviour generally does not occur autonomously and devoid of any influence from society (Bandura, 1977, 1986, 2002). Instead, according to the SCT, human behaviour is based on the continual reciprocity of personal, environmental and behavioural factors. A core parameter of the SCT involves the evaluation of social systems. Social systems or social norms are a by-product of human behaviours (Bandura, 1998; Gibson, 2004; Godin et al., 2008). In turn, human behaviour can be influenced by the pressure to conform to societal norms. As such, social systems can influence the organisation, structure and execution of human behaviour in several ways, for instance, poverty, gender discrimination, racism, cultural and religious beliefs (Bandura, 2004; Webb and Sheeran, 2006).

Social systems or social norms are also a core component of the theory of planned behaviour, which is discussed in the following section (Ajzen, 1991; Fishbein and Ajzen, 2010; Ajzen, 2011). A fascinating aspect of an environmental system is that it incorporates the malleability of society. Modern society is changing, the arrival and growth in the use of smart devices and the Internet have led to dramatic changes in how people view the world around them (Webb and Sheeran, 2006; Broekhuizen et al., 2012). The free expression of opinions and information is one of the greatest achievements of the modern era; however, it has the potential to promote antisocial behaviours such as racism, prostitution and drug abuse (Glanz, Rimer and

Viswanath, 2008; Baumeister and Bushman, 2013). By considering the environmental system in which behaviour takes place, such as upbringing and social demographics, it allows for the design of interventions that would be more culturally applicable (Bandura, 2002; Berry et al., 2011).

Criticism of Social Cognitive Theory

The SCT has seen extensive use in the health sciences to promote healthy behaviours, and it has been used in business research to increase productivity (Berry et al., 2011; Stacey et al., 2015). Its popularity could be due to its focus on the perceived self-efficacy of humans toward their behaviour and their capacity to be "agents" for changing behaviour. The continuous dualities among the factors influencing the SCT can allow for the design of theory-based interventions across numerous disciplines. However, caution must be employed when using the SCT or indeed, any theory.

For instance, a staple of the SCT is the duality between socio-structural factors and the agentic factors discussed earlier. If an intervention is based on the sociological norms of a specific area (for example, a country), then consideration should be given to how that intervention would fare if applied to a different social system without prior investigation and evaluation of the sociological norms in the new area. A significant benefit of using theory-based interventions is the possibility of replicability (West, 2005; Abraham and Michie, 2008; Berry et al., 2011). By putting such emphasis on the influence of social norms, the application of the SCT could be severely hindered across cultural boundaries.

There is a lack of relevant empirical evidence to endorse the use of SCT. Despite its popularity, there are relatively few studies that explicitly demonstrate the superior

impact of an SCT theory-based intervention compared to other interventions. Behaviour change is not a static concept. It is continually adapting and re-establishing due to the innumerable factors that can influence behaviours in our daily lives. An intervention may have short-term success; however, temporal changes to the lives of the participants may impact the effectiveness of an intervention or nullify them completely (Bandura, 1998; Williams, Anderson and Winett, 2005; Webb and Sheeran, 2006).

2.7.6 The Theory of Planned Behaviour (Ajzen, 1991)

One of the most popular and significant conceptual frameworks for the study of behaviour is the theory of planned behaviour (TPB) (Ajzen, 1991). The TPB has been used in both recreation ecology and environmental psychology (Sheeran, Trafimow and Armitage, 2003; Yang-Wallentin et al., 2003; Brown, Ham and Hughes, 2010; Vagias et al., 2014). The TPB assumes that in most cases, individuals make rational choices, a person's actions are not spontaneous or unpredictable and that our behaviour results from the intention to perform a specific behaviour. The stronger the intention, the more likely an individual is to conduct or perform that behaviour (Steg, Van Den Berg and De Groot, 2013). A visual representation of the TPB is given in Figure 2.4.

The TPB highlights the multifaceted influencers of behaviours and the interrelationships between these aspects. The aspects used in the TPB discussed in this section are:

- attitude or personal beliefs
- subjective norms
- perceived behavioural control.
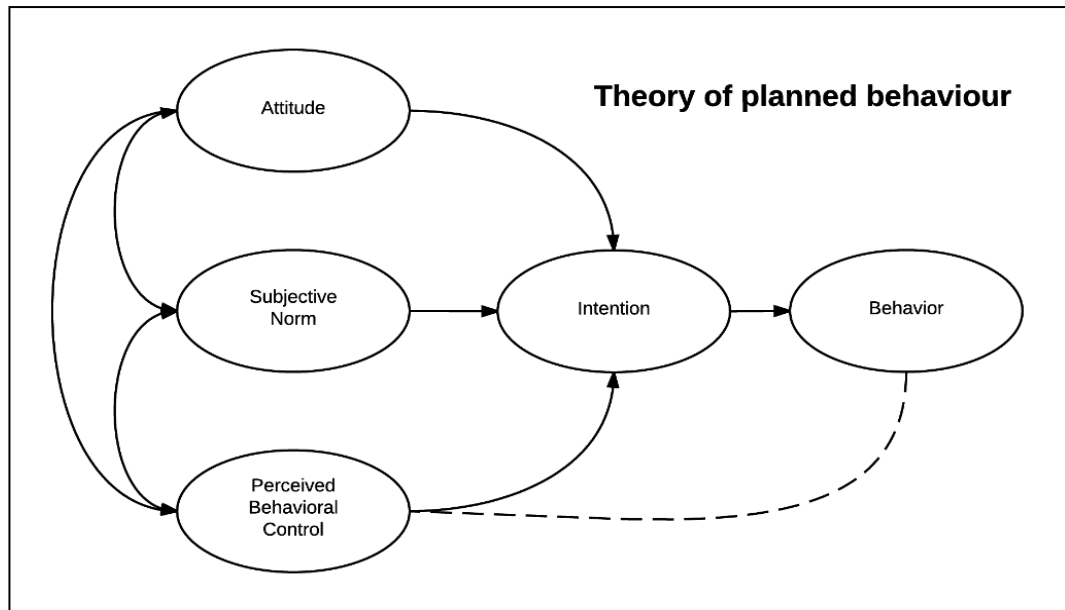
Figure 2.4 The theory of planned behaviour (Ajzen, 1991)

Aspects of the TPB

Attitude

In the theory of planned behaviour, attitude is defined by Ajzen (1991, p.188) as "the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question". The process through which attitudes are formed has been the subject of much study and discussion (Motherway et al., 2003; Steg, Van Den Berg and De Groot, 2013; Brownlee et al., 2013). Pigram and Jenkins (2005, p.22) described the formation of attitudes "through learning processes (reward systems, conditioning) that are embedded in experience". Our life experiences and knowledge aid us in the development of attitudes and these attitudes are susceptible to change. This change can occur through the implementation of tools such as persuasion (discussion, advertisements and incentives), compliance (regulations and social norms) and the acquisition of knowledge.

Prior knowledge, for instance, has been suggested as a significant factor in determining attitude (Smith et al., 2008; Manning and Anderson, 2012). The use of

education as a method of engendering a pro-environmental attitude has been a staple of recreational management strategies in the United States of America for decades (Leung and Marion, 2000; Ellis, 2005; Simon and Alagona, 2009). Studies have attributed most negative impacts to careless or uninformed recreationists, which suggests that an increase in environmental knowledge should lead to an increase in environmentally responsible behaviour (Manning, 2007).

An important consideration in relation to personal beliefs or attitudes is the amount of influence these beliefs have on the likelihood of changing behaviours. For instance, the cognitive dissonance theory first developed in 1957 by Leon Festinger deduced that "people experience psychological discomfort when there is an inconsistency between cognitions (attitudes, beliefs, values, opinions, knowledge) about themselves, their behaviour and their surroundings" (Juvan and Dolnicar, 2014, p.79). This suggests that when confronted with an inconsistency between their attitudes and behaviours, individuals can become uncomfortable. This can lead to the person changing either their belief or behaviour.

Place attachment has been described by Chow and Healey (2008, p.363) as a multidimensional concept, which involves the "interplay of affect and emotions, knowledge and beliefs, and behaviours" in reference to a place (Chow and Healey, 2008). A study by Lee (2011), suggested that the development of place attachment can affect the commitment to practise environmentally responsible behaviours in the context of outdoor recreation. The study posited that an emotional connection to an area could act as an antecedent to behavioural intention. In addition, research has been conducted into the development of a conceptual framework which illustrates the subconstructs of place attachment (Ramkissoon, Weiler and Smith, 2012;

Ramkissoon, Smith and Weiler, 2013). There has been some interest shown to the use of place attachment in the examination of behavioural change and the promotion of environmentally responsible behaviours, particularly in recent years (Ramkissoon, Smith and Weiler, 2013; Lee and Oh, 2018; Ajani, 2019). These studies suggest the existence of a positive relationship between place attachment and the practising of environmentally responsible behaviour. The studies lend support to the development of interventions which promote the "knowledge of, and sensitivity toward", the environment (Cheng and Wu, 2015, p.571). In addition, a study by van Riper, et al. (2018), suggested that place attachment and the use of outdoor recreation as an escape from everyday life may allow people to be more receptive to environmental messaging and the practising of environmentally responsible behaviours.

While studies have shown that environmental knowledge correlates with environmentally responsible behaviour, there are numerous examples of a knowledge–behaviour gap (Kollmuss and Agyeman, 2002). This suggests that pro-environmental attitude and knowledge might not be sufficient to induce environmentally responsible behaviours in all situations. Evidence of this "gap" between knowledge, attitude and behaviour is not isolated to recreational behaviours (Kollmuss and Agyeman, 2002; Vermeir and Verbeke, 2006; Juvan and Dolnicar, 2014). Scholars have suggested that attitude's influence on behavioural intention is insufficient to induce behavioural change in most circumstances. Thus, the theory of planned behaviour has incorporated additional components into its framework (for example, social norms and perceived behavioural control).

Social Norms

Social norms are described by Steg, Van Den Berg and De Groot (2013, p.186) as

"the extent to which a person believes that others would approve or disapprove of the behaviour". As social animals, many of our behaviours are influenced by how we are viewed in society or, in this case, how nature is perceived by the people we care about. Similar to the environmental and personal factors mentioned in the SCT, social norms have been examined in the hope of influencing behaviour through the activation of these norms (Terry and Hogg, 1996; Heywood and Murdock, 2002; Thøgersen, 2006; Nolan et al., 2008).

Studies have shown that social norms can have a strong influence on the behaviour of people. Asch's (1956) now-famous study on conformity illustrates the persuasive influence of social norms. In the experiment, participants were placed in a group of actors who were aware of the experiment. Participants were presented with a simple question, and each of the actors was instructed to answer the question incorrectly. Despite knowing the correct answer, the desire to conform to the group consensus caused the majority of participants to respond to the questions incorrectly (Asch, 1956). Similar to conformity, the perceived social norm has been suggested to be a predictor of behaviour. For instance, the abundance of litter in an area can influence the behaviour of an individual to litter in that area (Knight and Gutzwiller, 1995) which is influenced by the community. The saying "When in Rome, do as the Romans do", which is attributed to St. Ambrose, illustrates the practice of conforming to the social norm in different cultures. However, what might be seen as acceptable for one community could be vastly different for another (Sayan et al., 2013). Research has suggested that there is significant variation in attitudes across the countries as well as cultures, which makes social norms an important component of behavioural intention (Bell et al., 2007; Serenari, Bosak and Attarian, 2013; Vesely and Klöckner, 2018).

Studies have attempted to use social norms as an explanation of behaviour and as a conduit for behavioural change. For example, alcohol consumption is a significant concern for health organisations and governments, and the use of social norms as a motivator of behavioural change has been examined with mixed success (Perkins, 2002; Rimal and Real, 2003; Schultz et al., 2018). Social norms are an integral part of the theory of planned behaviour and consideration of social norms is vital when developing behavioural change strategies.

Perceived Behavioural Control

Perceived behavioural control (PBC), also known as the locus of control, is described by Steg, et al. (2013, p.187) as "the perceived possibility to perform the behaviour, which depends on beliefs about the presence of factors that may facilitate or hinder the relevant behaviour". One of the early criticisms of the theory of reasoned action was that it could only account for behaviours seen as voluntary (Ajzen and Fishbein, 1977; Trafimow et al., 2002). As such, PBC was introduced as a predictor of what is now the TPB (Ajzen, 1991). However, there is a debate that PBC consists of two different concepts, namely, a behaviour being "under a person's control" and "being easy/being difficult", which are not necessarily the same thing (Trafimow et al., 2002). More specifically, behaviour can be perceived to be under an individual's control based on several internal and external factors (Kidwell and Jewell, 2003).

Internal factors can be described as the level to which a behaviour is under an individual's control, that is, the individual perceives that they have the necessary resources (skills, knowledge, and confidence) to carry out the behaviour (Kidwell and Jewell, 2003). This concept of internal control is similar to the work by Bandura (1994, 1997b), which investigated the perceived confidence of individuals in

performing a behaviour. Studies suggest that the higher the perceived internal confidence, the more likely the individual is to perform that behaviour (Ajzen, 2002b; Sheeran, Trafimow and Armitage, 2003; Kraft et al., 2005; Hagger and Chatzisarantis, 2005). A person might have a positive attitude towards a behaviour (for example, cycling to work instead of driving). However, the person does not believe that they can perform this task. In this example, a person's evaluation of their abilities influences their intention for that behaviour. Research has shown that when personal efficacy is high, the possibility of environmentally responsible behaviour can be affected (Motherway et al., 2003). When people believe that their actions or behaviours can influence an environment and can make a difference, it can have a considerable influence on behavioural intentions (Manning and Anderson, 2012). Inner confidence has led to the study of what is known as a spill-over of behaviours (Dolan and Galizzi, 2015; Lauren et al., 2016). The individual feels confident in their ability to perform a particular behaviour and believes that their actions can make a difference, which could incite a behavioural change in other aspects of a person's life.

External factors can be viewed as the extent to which the target behaviour is influenced by external or extrinsic factors (Kidwell and Jewell, 2003). Factors such as facilities and the availability of information can affect perceived behavioural control for better or worse (Sime, 1999; Pietilä and Kangas, 2015). These facilitating conditions could include any external conditions that would make the performing of behaviour easy or difficult (Kidwell and Jewell, 2003; Vesely and Klöckner, 2018). Historically speaking, behaving responsibly in the outdoors has been viewed as the more difficult option for recreationists (Bandura, 1994). The influence of external factors on PBC indicates the importance of the sustainable design of recreational

facilities. Conversely, research suggests that the presence of adequate facilities is not enough to promote responsible behaviour in all cases, which is of particular relevance to this research with regard to outdoor recreation.

An interesting aspect of PBC is how it influences both the intention to perform a behaviour and the behaviour itself, which can be seen in Figure 2.4. The implications of this are significant as even with a positive intention to perform a behaviour, there can still be a number of internal and external factors that could limit the performance of a behaviour (Ajzen, 2002a; Kidwell and Jewell, 2003; Yang-Wallentin et al., 2003; Kang et al., 2006). For instance, a person may intend to take up exercise and adopt a healthier lifestyle. Despite the positive intentions and willpower, several PBC factors can hinder this progression (for example, cost, access to facilities and weather). Thus, despite the strength of motivation and intentions, PBC has limited the actualisation of the behaviour.

Criticism of the Theory of Planned Behaviour

Despite, or perhaps due to its popularity, the TPB has received a significant amount of criticism (Mairesse et al., 2012; Steg, Van Den Berg and De Groot, 2013; Sniehotta, Presseau and Araújo-Soares, 2014). One review suggested that parsimony has circumvented the validity of the theory as a determining factor during intervention design, which accounts for its popularity (Sniehotta, Presseau and Araújo-Soares, 2014). Critics of the TPB argue that the theory excludes some of the unconscious influences of behaviours and that the determinants of behaviours can be nonconscious, impulsive and associative (Sheeran, Gollwitzer and Bargh, 2013).

The relatively low cost of education and awareness-based interventions could be an

incentive to adopt TPB-based interventions instead of other more intrusive interventions (Truelove et al., 2014; Lee, Jan and Huang, 2015). While this view could be seen to have some merit, there is evidence that low intrusion interventions are more effective at changing behaviours, particularly in regard to recreation behaviour (Jones and Bruyere, 2004; Pigram and Jenkins, 2005; Pilcher, Newman and Manning, 2009).

While this conceptual framework has much support in the field of research, some scholars question the strength and validity of such frameworks at predicting behaviour (Kollmuss and Agyeman, 2002; Biel and Thøgersen, 2007; Lee and Jan, 2015). The sheer multitude of factors that can influence behaviour is dynamic and complex. There is debate amongst researchers on the use of any/all conceptual frameworks in their attempts to understand behaviour (Hagger and Chatzisarantis, 2005; Bamberg and Moser, 2007; Steg, Van Den Berg and De Groot, 2013). Critics of the TPB argue that there is again a lack of empirical evidence that use of the TPB will significantly influence behaviour. Critics postulate there are significant amounts of variability in observed behaviour which are not encapsulated by components of the TPB (Kollmuss and Agyeman, 2002; Webb and Sheeran, 2006; Sniehotta, Presseau and Araújo-Soares, 2014). This results in a low level of variance being explained by the TPB, which could cause the creation of policies that are not fit for purpose.

There needs to be a reiteration of the opinion expressed by Bandura that "The value of a psychological theory is judged not only by its explanatory and predictive power but also ultimately by its operative power to promote changes in human functioning" (Smith and Hitt, 2005, p.12). Similar to both the transtheoretical model and social

cognitive theory, the TPB can be a useful framework upon which to base a behavioural intervention. The visualisation of relationships between factors of behavioural intention demonstrate the complexity of the decision-making process. Designers of a behavioural intervention using the TPB need to be aware of how to address these factors.

However, a clear understanding of the concepts involved with each theory as well as an understanding of the target population is vital to the success of the intervention.

2.7.7 Other Theories

The theories discussed hitherto represent some of the more established and critiqued theories in behavioural change to date. However, it is also important to consider newer theories and those that are not as prevalent in the literature.

Nudge Theory

A nudge is described by Thaler and Sunstein (2008, p.6) as "any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives". The use of nudge has been seen to be effective in some cases; however, critics of its use advocate that a nudge is just another form of paternalism and involves the manipulation of choice (John, Smith and Stoker, 2009; Hansen and Jespersen, 2013; Mols et al., 2015). It has recently been suggested that nudge theory may aid in increasing compliance for recreational fishery regulations: traditional punitive measures have been seen to be ineffective (Mackay et al., 2018). Mackay et al.'s study suggested that nudge theory can be utilised to complement traditional methods and in doing so, increase compliance. The research is quick to point out that nudge theory should not be seen

as a quick fix to compliance and should be considered with careful design (Mackay et al., 2018). There could be some benefit to the use of nudge theory in the context of outdoor recreation, but it would require significant organisation due to the vast geographical range in which recreation can take place. In addition, a popular aspect of recreation is the escape from a busy lifestyle (Gelter, 2000; Godbey, 2009). Interventions that appear to manipulate people could be met with non-compliance.

Social Practice Theory

It is essential to first distinguish the meaning of "practice" in practice theory. Generally, practice is seen as opposed to theory in that practice refers to action, whereas theory is concerned with thinking. In practice theory, however, the term "practice" refers to a practice or practices as a noun. This means that any action or behaviour can be viewed as part of a practice. The use of social practice theory involves the rationalisation and use of a particular way of understanding and viewing society. There is debate on whether social practice theory could even be considered a true theory (Reckwitz, 2002). Social practice theory moves focus from an individual as the critical component of behavioural change. Instead, the practice itself becomes the unit of analysis (Reckwitz, 2002; Hargreaves, 2011).

Instead of focusing on the attitudes, motivations and perceptions of individuals, social practice theory directs attention to the practical accomplishment of everyday tasks. As described by Reckwitz (2002, p.5): "As individuals pass through life, they come into contact with, get recruited to, have 'careers' within, and occasionally defect from a wide variety of different practices". It is from the performance of these social practices that individuals begin to understand the world around them and seek to develop a sense of self (Warde, 2005, 2014). There is some merit to the idea of

taking a more comprehensive look at the actions themselves and to not focus on the attitudes and perceptions of individuals but rather focus on the systems that are in place that affect the practices of people (Shove, Pantzar and Watson, 2012).

There is still concern on how to separate and identify the social practice that would need to be amended (Reckwitz, 2002; Schatzki, Cetina and von Savigny, 2005; Warde, 2005; Shove, Pantzar and Watson, 2012). Advocates of social practice theory argue that an individual's decision-making ability is not ignored. However, the theory focuses on the more significant components, which seem to supersede individual autonomy. However, this may be too harsh a criticism. This idea of being influenced by society and the fundamental practices that shape our actions is not necessarily a new concept, as previously discussed in Section 2.7.5. Social systems or social norms can be seen as a by-product of human behaviours, which in turn can influence future actions (Bandura, 1998; Gibson, 2004; Godin et al., 2008).

The application and generalisation of practice theory could make replication difficult. In addition, there seems to be a significant level of debate on how empirical evidence to support this theory should be collected. Furthermore, there seems to be confusion on the accepted definition of what a social practice is, and even what social practice theory is (Reckwitz, 2002; Schatzki, Cetina and von Savigny, 2005; Warde, 2005; Hargreaves, 2011).

Action–Value Opportunity

The action–value opportunity posits that while a number of daily life choices are made without prior consideration of the environmental impact, some of these choices are inadvertently the less damaging option, with the decisions being made without

an environmental agenda (Hitchings, Collins and Day, 2015). This idea builds on the value–action gap that is prevalent in environmental literature (Kollmuss and Agyeman, 2002; Vermeir and Verbeke, 2006; Mairesse et al., 2012; Juvan and Dolnicar, 2014). This gap between attitude and beliefs versus behaviour continues to be a topic of many studies, particularly in relation to bridging the gap. The action–value opportunity proposes ways to build on inadvertent environmentalism in a number of ways, including ignoring the values entirely, building on existing ethics or celebrating previously unacknowledged environmentalism (Hitchings, Collins and Day, 2015).

The final suggestion regarding celebrating unacknowledged environmentalism is reported to fit well with the idea of the value–action opportunity. People have reported that doing the environmentally responsible thing can cost more money or be more dependent on time and effort (Trafimow et al., 2002; Lauren et al., 2016), with perceived difficulty being a major component of a number of established behavioural theories. The celebration and acknowledgement of responsible behaviours could encourage people who were previously unaware of their inadvertent environmentalism. Therefore, the opportunity for more responsible behaviours in the future will increase. This is an interesting concept which incorporates factors such as time and highlights the importance of communication for the encouragement of environmentally responsible behaviours.

Social Identity Theory

Social identity was conceived by Tajfel's work to investigate the intergroup conflicts in the 1970's (Tajfel and Turner, 1979; McKeown, Haji and Ferguson, 2016). Its most fundamental assumption argued that group behaviour is more than a collection

of individuals behaving as one. For this reason, social identity focuses on the development and psychology of how a group operates in the minds of an individual. These groups can be large demographic groups based on factors such as gender or age, or they could be smaller groups separated by, for instance, type of recreational activity. These groups can provide a shared mentality to their members as well as prescribing and evaluating who they are, what they should believe and how they should behave (McKeown, Haji and Ferguson, 2016).

Membership to a distinct group has been suggested to reduce uncertainty and to increase the self-esteem of an individual, as they now possess a structure into how they should behave (McKeown, Haji and Ferguson, 2016). Other scholars have argued that a person can possess multiple social identities (Mols et al., 2015; McKeown, Haji and Ferguson, 2016). As such, the effectiveness of persuasive messaging can be significantly affected if message comes from a source that the individual shares a social identity with (Mols et al., 2015; McKeown, Haji and Ferguson, 2016). With conflict between recreational groups already being evident in the literature (see Section 2.4.2), social identity theory may shed light on effective development of behavioural interventions that target multiple groups. The use of groups in the design of behavioural interventions is not a new concept, but an understanding of how recreational groups consider themselves may prove useful (Fielding, McDonald and Louis, 2008; Mols et al., 2015).

Maslow's Hierarchy of needs

In the discussion of personal factors and motivation, it is important that consideration is given to a person's needs. Maslow's hierarchy of needs (Maslow, 1943; Kollmuss and Agyeman, 2002; Wishitemi et al., 2015), organises a person's needs in a hierarchal structure from self-fulfilment to psychological needs to basic needs. The

hierarchy of needs suggests that an individual who is concerned with obtaining the basic and psychological needs would possess less time to contemplate issues concerning the environment, which could hinder the effectiveness of environmental messaging.
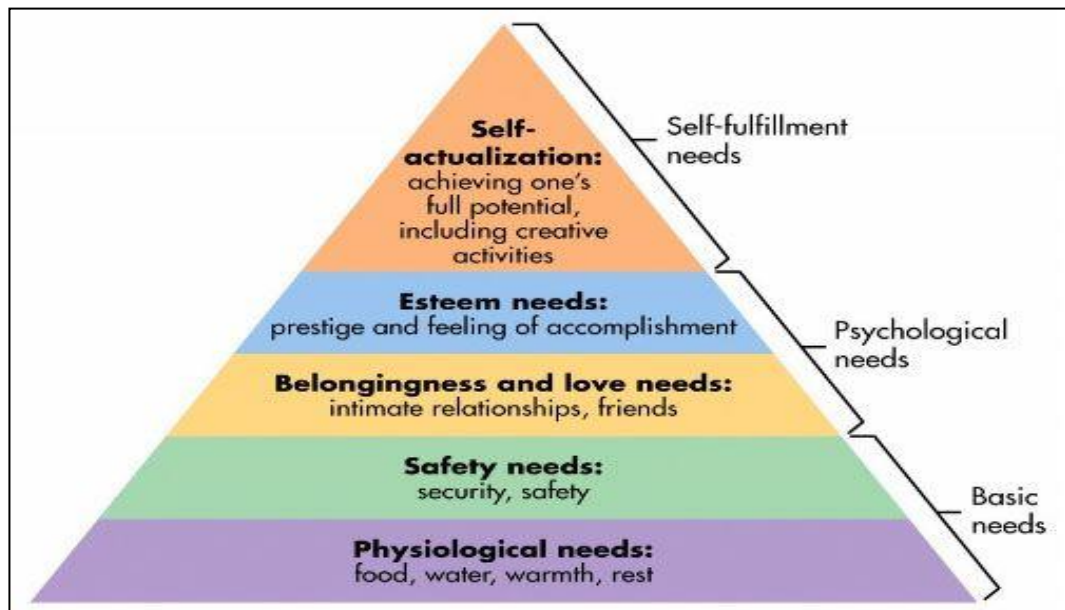
Figure 2.5 Maslow's hierarchy of needs (Maslow's Hierarchy of Needs | Simply Psychology, 2017)

The structure of Maslow's hierarchy of needs has been adapted into research which has attempted to understand the underlying motivations of a person's thought process and consider the most relevant needs of the target audience (Phillimore and Goodson, 2004; Baumeister and Bushman, 2013). The use of Maslow's needs hierarchy has aided in tourism research which creates a link between tourism research, consumer behaviour and psychology (Veal, 2006; Jennings, 2007).

Although the use of Maslow's need hierarchy is subject to criticism, it remains a useful conceptualisation of the needs of the individual and how these needs can change depends on a number of factors (Fundukian and Wilson, 2008).

2.7.8 Summary of the Use of Behavioural Change Theories

All three of the most prominent theoretical frameworks (TTM, SCT and TPB) have seen extensive use in the literature and have been used in the design of a number of behavioural interventions (Webb and Sheeran, 2006; Abraham and Michie, 2008; Godin et al., 2008; Young et al., 2014).

While all three theories have significant support in their usage as well as criticism due to their status, there is enough evidence to defend the use of a theoretical framework in the design of behavioural interventions. There seems to be an unwillingness to add new aspects to established frameworks which is confusing considering the diverse and complicated nature of understanding human behaviour (Sideridis, Kaissidis and Padeliadu, 1998; Hagger and Chatzisarantis, 2005; Kaiser, 2008).

Table 2.1 Summary of behavioural theories

Theory	Strengths	Weaknesses
Transtheoretical Model of Change	Incorporates time, adaptable across numerous disciplines. Illustrates behavioural intention as a fluid concept which can change over time.	Difficulty in quantifying success. Could be challenging to frame theory in the context of outdoor recreation. Difficult to develop short term interventions based on this model. Over-reliance on self-reporting when assessing intervention effectiveness.
Social Cognitive Theory	Highlights the agentic perspective, illustrates that humans are affected by and have an effect on their surroundings. Discusses the importance of self-efficacy	Difficult to replicate studies using SCT due to the emphasis placed on sociological norms. By putting such emphasis on the influence of social norms, the application of the SCT could be severely hindered across cultural boundaries. Seeing as society, culture, trends and attitudes are constantly in flux, there is a concern about using and intervention which utilises sociological norms. Certain factors may become less relevant in the future.
Theory of Planned	Robust theory. Widely used across numerous disciplines.	Some scholars question the strength and validity of TPB.

| Behaviour | Describes a large number of factors that influence intention. | Lack of empirical evidence that the theory of planned behaviour can significantly influence behaviour. |
| | Shows the importance of the interrelationships between factors. | A reluctance to adopt new factors into the theory. |

Most studies would advocate that a variety of motivations or factors can influence behaviour at any one time and that the influence of certain factors (e.g. social norms) can be more prominent at different times. However, there seems to be a lack of adaptability in the creation of these theoretical frameworks and, by extension, the design of behavioural interventions.

As discussed in Section 2.7, the factors that influence behaviour are interlinked and not easily quantifiable. The interrelationships between these factors are dynamic and require further study as a strong influence on one behaviour can vary under different situations and circumstances.

2.7.9 Irish Research on Behaviour

The following sections examine research on the pro-environmental attitudes and behaviours of people in the context of Ireland. As pro-environmental attitudinal and behavioural research in the context of outdoor recreation in Ireland is limited, it is important to acknowledge some of the prominent research in the related sphere as it elucidates a number of general themes which can serve as a foundation of further investigation.

Environmental Attitude and Self-Efficacy in Irish People

As described in Chapter 1, Motherway, et al., conducted a significant investigation of environmental attitudes in Ireland across demographics (Motherway et al., 2003). The research used a national survey of environmental attitudes to develop a study on

environmental attitudes, values and behaviour designed by the International Social Survey Programme (ISSP). The study was able to repeat many of the questions asked in a previous study in 1993 that examined environmental trends in Ireland, and this enabled trends and changes over the decade interlude to be examined. The study used a three-stage clustered sampling approach for sample selection, the most up to date electoral register was used as a sampling frame. In total the sample size was 1257, of these, 951 respondents returned a self-completion questionnaire. The topics covered in the study ranged from environmental attitude, trust of organisations, the influence of religion and science, environmental and scientific knowledge and personal efficacy.

Motherway, et al., examined the extent to which Irish people's environmental attitudes and behaviours changed over the period 1993–2002 (Motherway et al., 2003). The report found that despite the changes in environmentalism between 1993 and 2002, the change in response patterns to the survey was arguably quite small. The study found that the concept of sustainable development has become a dominant feature in political discussions over the environment as well as a core concept of future policy development (Motherway et al., 2003).

The study by Motherway, et al. (2003) also noted that respondents did not believe in a dichotomy between economic growth and environmental protection (Motherway et al., 2003). The study posited that environmental protection is seen as essential to continued economic growth by respondents. Interestingly, the study did note that responses to scientific knowledge questions reveal a generally low level of such knowledge. It is of particular note that the study separated the concepts of environmental knowledge and attitudes for this study, which supports the belief that

knowledge and attitude should be considered as linked, but distinct. Further support

for this is seen in similar research in outdoor recreation, as many impacts are a result

of uninformed, unskilled and careless actions. A number of themes and findings of

the comprehensive study by Motherway, et al. (2003) are not within the purview of

this research. The influence of religion in relation to scientific credibility in

respondents is one example of this. Nevertheless, a number of noteworthy concepts

were relevant to this research. The influence of demographics in the analysis was

significant as it leads to interesting avenues of analysis and further research. For

example, the research found that environmental concern and willingness to act

increased with education level. This could be of particular interest to this research

due to the generally inclusive nature of outdoor recreation.

Explanations for why differences exist in Irish people's environmental attitudes and

behaviours were discussed using three theoretical frameworks (Kelly et al., 2003).

While concern regarding environmental dangers was quite strong among the Irish

population, pro-environmental practices were weaker. A number of cultural reasons

for the disparity between environmental concern and pro-environmental practices

were explored. Three sets of broad cultural values which can contribute to

encouraging pro-environmental attitudes and behaviours were examined using the

New Environmental Paradigm as well as the Cultural Values Paradigm (Kelly et al.,

2003). The first set highlights the concern for the fragility of nature as well as the

need for its protection. Egalitarianism was identified as the second important factor

as it illustrates the rejection of society's unequal systems as well as indicating a need

for collaboration in political actions to change things for the better, The third value

set was empowerment which highlights the efficacy of an individual as well as a

critique of established authoritarian, hierarchical structures.

This study found that both egalitarianism and empowerment could contribute to the willingness of participants to have more pro-environmental attitudes and behaviours (Kelly et al., 2003). There are a number of links between this research and previous research into self-efficacy, as seen in SCT (Bandura, 2001b). This suggests the importance of understanding the motivators of behaviour beyond environmental concern.

The investigation of Irish peoples environmental attitudes was developed further in a comparative study with European counterparts, Kelly, et al., (2004), examined how the environmental values, attitudes and behaviours of Irish people differed from those of their European neighbours (Kelly et al., 2004). The study posited the if European environmental attitudes and behaviours could be arranged on a spectrum (with pro-environmental countries like Scandinavia and the Netherlands at the top and Southern European and ex-socialist eastern countries on the bottom), then Ireland holds a more intermediate position. This finding was found across almost all of the indices used by the study, which included pro-environmental attitudes, political mobilisation, post-materialism and anti-modernisation (Kelly et al., 2004). Again this study identified a disjunction between the reported pro-environmental, political mobilisation and cultural values on the one hand and actual pro-environmental behaviour on the other (Kelly et al., 2004).

These reports represent a significant body of work regarding the environmental attitudes of Irish people through a number of factors. The importance of culture, the disparity between attitude and action as well as the importance of self-efficacy and empowerment were highlighted through the research and illustrate how these factors can be important motivators for behavioural change.

Low levels of trust were shown towards businesses as well as governmental departments regarding the ability of those organisations to present truthful information about the causes of pollution (Motherway et al., 2003). A contradiction is noted in the study regarding the distrust shown to government officials, yet when faced with the theme of environmental concern, respondents were strongly supportive of government-led responses, through regulation and even through higher prices or taxes where necessary (Motherway et al., 2003).

Unfortunately, the study has not retested since which could have led to some interesting comparisons on the shift of attitudinal thinking over a longer span of time. In addition, Ireland has undergone significant social reform since this research was conducted and a more up to date examination of these factors would be of significant value. A report from Behaviour and Attitudes, which is Ireland's largest independent market research company could offer an interesting comparison. The 'sign of the times' report for 2018 published by Behaviour and Attitudes suggests that there is a growing awareness of environmental issues such as plastic in the oceans and sustainability (Behaviour and Attitudes, 2019). The study also reported that 51% of respondents indicated environmental concern as a factor that influenced their consumer choices. These findings echo the proposals of previous research in Ireland, which posited that despite environmental concern, the gap between attitude and behaviour is still present (Motherway et al., 2003).

Despite the suggested support for government-led responses to environmental issues in a broad sense, more research is needed to see if the pro-environmental attitude and support for government initiatives are found within the context of outdoor recreation. This is important as regulation and paternalism could dampen the enjoyment of

recreationists who travel to the outdoors to unwind (Leung and Marion, 2000; Manning and Anderson, 2012; Skår and Vistad, 2013).

The Development of Habitual Behaviours in Ireland

Chapter 1 briefly discussed a more recent study on Irish, pro-environmental behaviours conducted by 951, Rau and Fahy (2015). The research was conducted to investigate behaviour in the context of habitual and occasional circumstances. The study implemented a quantitative research design using a sample size of 1500 people from three areas across Northern Ireland and the Republic of Ireland. A multistage cluster sampling strategy was used, and the main clusters were further investigated using electoral districts. Respondents were asked which habitual behaviours they had undertaken during the past month such as reducing energy consumption, conserving water, avoiding heavily packaged products, buying reusable products instead of disposable ones. In addition, respondents were asked about occasional actions undertaken in the five years prior to being surveyed such as the purchasing of energy-efficient appliance or car, switching to a renewable energy supplier, and installing insulation (Lavelle, Rau and Fahy, 2015).

The influence of habits on behavioural intention has previously been discussed with the TTM in Section 2.7.4. Habitual behaviours occur most frequently, for example, bringing a reusable coffee cup every day, whereas an occasional behaviour could be buying an electric car. Lavelle, Rau and Fahy's study serves as a good example of how environmental behaviours should not be categorised as one. Factors which demonstrated a significant influence on the behavioural intention to perform a habitual behaviour did not have the same level of influence when compared to occasional behaviours, and vice versa. As such, this study illustrates the need to

examine behavioural change as perhaps an iterative process, similar to the TTM, multiple interventions and constant engagement with participants may be more successful in the creation of habitual behaviours. The research is similar to the value action opportunity research discussed earlier in Section 2.7.7 and could be useful in the design of behavioural interventions.

Although there has been some research conducted investigating environmental attitudes and behaviours from an Irish perspective, encouraging pro-environmental behaviours in outdoor recreation in Ireland remains largely unstudied. One study which examined the encouragement of sustainable consumption presented some compelling findings. The study posited that there is no single method that can or should be used to implement sustainable consumption policy. Instead, it is believed that successful implementation requires a number of key factors (Pape et al., 2011). These factors include high levels of commitment at a national level as well as a multi-stakeholder approach. In addition, a clear definition of objectives as well as indicators and the establishment of a recurring monitoring programme would be key factors (Pape et al., 2011). This study highlighted the importance of stakeholder identification and engagement while also illustrating that a clear focus combined with strong levels of commitment from participants can be important to the implementation of behavioural change.

Previous sections have discussed the differences in opinions and attitudes between different countries. These differences can manifest in how these countries try to regulate the negative impacts that occur because of outdoor recreation. For instance, the Scandinavian countries have a culture of everyman's right, which emphasises the legal right of access of every person to outdoor recreational areas; this is in contrast

to the private ownership and limited access to land in Ireland.

There is previous research into the Irish public's attitude to the environment (Motherway et al., 2003; Kelly et al., 2003); however, it is possible that the more environmentally conscious growth in Ireland could be due to the economic growth during the timescale of the research (1992–2002) as the willingness to adopt environmentally responsible behaviours can be influenced by economics as discussed in Section 2.5.1. Given that Ireland is only now recovering from a global recession, further research is needed to investigate if this environmentally conscious attitude has evolved in any way. In addition to environmental attitudes, Kelly, et al. (2003) examined the variance in the degree of trust that the Irish public has in different organisations. They found low levels of trust in government agencies and industries, but high levels of trust in universities. It is reasonable to assume that this trend of distrust has continued following the global economic downturn, the bailout of the banks and the failed introduction of household water conservation charge (Quinn et al., 2016; Lavelle and Fahy, 2016).

2.8   Interventions for Behavioural Change

The 21st century heralded in a new era of research into how and why we perform behaviours. Consequently, investigations into how to change and alter behaviour have become popular. Furthermore, there has been a significant debate on the evaluation of these interventions in terms of validity, rigour and utility (Rychetnik et al., 2002; The Scottish Government, 2015). Some researchers advocate the pragmatic approach that, if it works, the intervention can be deemed a success. Many others, however, stipulate the need to understand how and why it works or, in some cases, why an intervention did not work (Conrod et al., 2006; Dunn, Resnicow and Klesges,

2006). This section examines several behavioural interventions in a range of contexts. The justification, design and outcomes of these interventions will be examined as well as the cultural and geographical context in which these interventions took place.

Behavioural interventions (also known as behavioural change interventions) can be regarded as the co-ordinated implantation of activities designed to change identified behaviour patterns (Abraham and Michie, 2008; Michie, van Stralen and West, 2011). These behaviour patterns have been measured with regards to their prevalence or occurrence within a specified population (for example, drinking by college students). The number of disciplines that have integrated and adapted behavioural psychology supports the need for this research. Support for the theoretical modelling of the behavioural intentions has become prevalent in the literature in recent decades (Glanz, Rimer and Viswanath, 2008; Brown, Ham and Hughes, 2010; Steg, Van Den Berg and De Groot, 2013; Sniehotta, Presseau and Araújo-Soares, 2014). Consequently, this has sparked vigorous debate and criticism in the quest for a "gold standard" theory upon which to base behavioural interventions. One of the main areas to use behavioural interventions is the health sciences. There has been a growing trend to introduce theory-based interventions in several areas (for example. dieting, smoking, drinking, and drug use).

This section examines a variety of interventions across a number of disciplines and discuss the use of interventions across geographical and cultural boundaries. The first section focuses on Ireland in order to examine the cultural response to a range of intervention strategies. Behavioural interventions from outside of Ireland are then discussed in order to understand behavioural change in the context of outdoor

recreation.

2.8.1 Behavioural Interventions in Ireland

While there is a significant amount of behavioural change research carried out in alternative geographical and topical contexts regarding outdoor recreation, there is a paucity of behavioural change literature in Ireland. An interesting aspect in the evaluation of interventions comes from the justification and reasons leading up to the intervention. The design of an intervention has become the topic of much debate in recent years. As discussed previously, the use of theory in intervention design can have a significant effect on the success of the intervention (Conrod et al., 2006; Kaiser, 2008; Davis et al., 2015). This section examines the design process and implementation of three interventions in Ireland.

The Smoking Ban in Ireland

In Ireland, one of the most prominent interventions in recent years has been the introduction of the smoking ban in workplaces. There exists a veritable cornucopia of health research available on the harmful effects of smoking (Bandura, 2004; Glanz, Rimer and Viswanath, 2008; Neuman, 2013; Fernández, 2016). There is little doubt on the adverse impacts of smoking on both the smoker's health and the people around the smoker due to second-hand smoke. What is curious about this information is that there is still a prevalence of smoking in modern society. Despite the widespread and conclusive evidence damning the continuation of smoking, people continue to smoke. This resonates with other research into human behaviours and the effect of knowledge. In many studies, knowledge is not a particularly strong predictor of behaviour (Juvan and Dolnicar, 2014; Imran, Alam and Beaumont, 2014). The health issues related to smoking are of particular relevance to Ireland

(Whitelaw et al., 2000; Pigram and Jenkins, 2005; Fernández, 2016). Ireland had one of the highest rates of cardiovascular, cerebrovascular and respiratory mortality in Europe as a direct result of tobacco smoke pollution or second-hand smoke (Stallings-Smith et al., 2013; ICF International, 2016). Due to extensive research and growth of public concern, a smoking ban was introduced on the 29th of March 2004. This has been described as one of the most successful stories in public health history (Fernández, 2016).

Ireland became the first country in the world to introduce a complete ban on smoking in the workplace, which included recreational areas such as pubs and restaurants. The introduction of this ban was seen as a counterintuitive proposal, given Ireland's association with and history of pub culture (Allwright et al., 2005; Fong et al., 2006). One of the main concerns about the implementation of this policy was the issue of policy enforcement (Fernández, 2016). The concern for authorities stemmed from the difficulty in enforcing the new regulations on such a comprehensive policy. This is of particular interest in regard to behavioural interventions designed by land management officials, as regulation is seen as a short-term, expensive and conflicting approach to changing behaviour (Knight and Gutzwiller, 1995; Pigram and Jenkins, 2005; Manning and Anderson, 2012). In Ireland, for example, most funding that goes to outdoor recreational areas (National Parks, SPAs, and SACs) comes from the government. These limited funds make it difficult to enforce a regulation in locations that can be large (Pigram and Jenkins, 2005; Manning, 2007; Manning and Anderson, 2012). The implementation of the smoking ban should have been faced with similar challenges as those facing management officials in outdoor recreation areas. However, in order to reduce the cost of policy enforcement and to aid in the acceptance of the intervention, the government tailored its appeals to the public using

the "denormalisation" of public smoking and "responsibilisation" of citizens (Fernández, 2016).

One of the most popular methods of changing behaviour is to change a person's attitude towards performing that behaviour (Pigram and Jenkins, 2005; Aronson, Milton and Blignaut, 2007). In Ireland, for example, a number of campaigns were used to denormalise the idea of smoking in the workplace. Denormalisation is described by Bell, et al. (2010, p.795) as "all the programs and actions that are undertaken to reinforce the fact that tobacco use is not a mainstream or normal activity in our society". This worked by appealing to the public to look at the idea of smoking in the workplace and indeed to view smokers as damaging other people's health. An excellent example of this is a quote from Minister for Health and Children, Micheál Martin on 30th of January 2003 "you don't have to be a smoker to get cancer from cigarette smoking, you can get it if you were never a smoker. You get it from other people's smoke". This approach also targeted smokers by highlighting the differences between smokers and irresponsible smokers. People were able to adopt new attitudes towards smoking in the workplace.

The term "responsibilisation" refers to the promoting of control from one authority to another (Fernández, 2016). This approach is used to encourage the public to take an active role in securing their own wellbeing by encouraging people to view passive smoking as a hazard that can and should be avoided. Both the denormalisation and responsibilisation methods employed by various campaign groups and government bodies can be viewed as an example of bottom-up intervention strategies (Trochim, 2001; Creswell, 2013).

The Plastic Bag Levy

The current trend in research and environmental campaigns leans towards raising awareness of the dangers of single-use plastics. There are similarities in the efforts made by the Government of Ireland, discussed earlier in this section, regarding mitigating the effects of littering and plastic use in Ireland. This section describes the intervention and multifaceted approach that was taken by the government in order to curtail the prevalence of plastic use. Similar to the smoking ban, this intervention represents a large-scale attempt to curtail behaviours across Ireland.

The use of regulation was also found in the intervention design regarding plastic bag use. The plastic bag tax, introduced in 2002, allowed the government to levy a €0.15 charge per plastic bag supplied to purchasers at retail outlets (Convery, McDonnell and Ferreira, 2007). Despite plastic bags not having a relatively large share of the total waste pollution (approximately 5% of total litter), plastic bags were regarded as being a particularly visible form of pollution (Convery, McDonnell and Ferreira, 2007). This intervention was mainly targeted at changing consumer behaviour. It adopted a nudge approach that economically punished those who did not adopt environmentally friendly purchasing behaviour.

Despite criticism about the levy, it was introduced, and the results were found to be both significant and widespread (Convery, McDonnell and Ferreira, 2007; McDonnell, Convery and Ferreira, 2008). Studies have estimated that since the introduction of the levy, there has been an approximate 94% reduction in the number of plastic bags entering the consumption stream (McDonnell, Convery and Ferreira, 2008; Convery, McDonnell and Ferreira, 2007). Additionally, several environmental groups who conduct litter surveys noted a significant increase in the number of clear

areas without a trace of plastic bag litter. This was an interesting finding given the longevity of plastic bags in the environment. It is also of particular importance to outdoor recreation in Ireland as large numbers of plastic bags have been transported to protected areas by wind processes.

Both interventions discussed above have used regulation in a bid to change behaviour. However, that does not mean that all desired behaviour changes can be accomplished using the same methods. Furthermore, the interventions have been based on a large scale that affects the whole population.

Alcohol Consumption in Sports People

To move away from nationwide interventions in Ireland, the motivations for the next intervention are intertwined with culture in Ireland but focused on a particular target population. The following intervention was on a more localised scale, with a purposive selection of participants. Nevertheless, the implications of this intervention are relevant to this research.

Ireland is well known for its pub culture as well as the cultural attitude towards the consumption of alcohol. This results in Ireland having one of the highest rates of alcohol consumption in Europe (Fernández, 2016). Studies estimate that 81% of Irish adults drink alcohol, with the proportion of non-drinkers (19%) lower than the European average (Morgan et al., 2009). Similar to research conducted on the hazards of smoking, there are numerous studies attesting to the dangers of alcohol consumption (Morgan et al., 2009; Calman, 2009; Le Grand and New, 2015; O'Farrell et al., 2017). Additionally, there are reports of higher rates of alcohol misuse found in professional and semi-professional sportspersons (Rowland, Allen

and Toumbourou, 2012; O'Farrell et al., 2017).

The study conducted by O'Farrell, et al. (2017) was inspired by previous attempts to curb alcohol misuse by community-led interventions (Holder et al., 1997; Wagenaar, Murray and Toomey, 2000; Holder, 2006). The intervention was conducted over four months and consisted of:

- alcohol education for players
- alcohol education for team coaches
- alcohol policy training for club managers and coaches
- an awareness campaign on the hazards of alcohol misuse.

This intervention focused mainly on the promotion of an educational and awareness ethos regarding behaviour change, which is somewhat different from the interventions discussed previously. The premise of this intervention is that by supplying knowledge and making people aware of their actions (that is the hazards of alcohol misuse and the recommended weekly intake of alcohol), the participants will then alter their behaviour. This type of intervention has been used in a variety of contexts with mixed results (Kollmuss and Agyeman, 2002; Mairesse et al., 2012; Higham, Reis and Cohen, 2015). Its popularity stems from the concept of personal responsibility and that a person is capable of behavioural corrections once information on their actions is made available to them. There were several limitations in the execution of this intervention: a significant limitation is noted in the low participation rates from the target audience (O'Farrell et al., 2017). In comparison with the studies which this intervention was based on, a number of differences in the intervention procedure were found. The study in question extrapolated and based its intervention design on research conducted in other countries, which poses severe challenges as discussed earlier in this chapter (Gentin, 2011; Sayan et al., 2013;

Mackie et al., 2015). All interventions discussed here, although in different contexts and audiences, aimed to change the behaviour of Irish people.

Intervention Outcomes

The classification of a successful intervention can be a complicated issue (Trochim, 2001; The Scottish Government, 2015; Friman, Huck and Olsson, 2017). Indeed, one of the most cited criticisms of many studies is the stated success of an intervention. Thankfully, the evaluation of the smoking ban in Ireland is arguably much more straightforward to assess due to the presence of available literature. Studies illustrate a significant decline in smoking in venues (workplaces, restaurants and bars) following the introduction of the ban in Ireland (Stallings-Smith et al., 2013; Fernández, 2016). Additionally, follow-up studies show high levels of support for the introduction of the ban and some smokers even stated that the smoking ban made it much more likely for them to quit (Fong et al., 2006). The implementation of the smoking ban has also been associated with immediate mortality reductions in the population (Stallings-Smith et al., 2013). This reduction is attributed to the reduction in exposure to passive smoking in the workplace and has been shown to have had a significant effect on hospital admissions. The temporal aspect of the smoking ban's effectiveness is worthy of note. The impacts of this intervention were seen quite clearly and with immediate effect. This is somewhat different from many interventions, the results of which appear on a more gradual scale (for example, dieting).

Despite decades of health literature and campaigns illustrating the dangers and hazards of smoking, a well-informed and communicated population-level intervention dramatically reduced the levels of exposure to second-hand smoke and

denormalised a behaviour to make it unappealing to the population. This resonated with much social science work that focuses on the importance of communication and tailoring in intervention design (Bell et al., 2010; Michie et al., 2015; Alahäivälä and Oinas-Kukkonen, 2016; Ussher and Perz, 2017).

The introduction of the plastic bag levy in 2002 is an interesting contrast to the smoking ban in Ireland. While both interventions were designed to utilise policy to change behaviour, the plastic bag levy was a more heavy-handed approach. Reports conducted after the introduction of the levy suggest that there was an estimated 94% reduction in the consumption of plastic bags (Convery, McDonnell and Ferreira, 2007; McDonnell, Convery and Ferreira, 2008). The disincentive caused a sudden shift in behaviour, which should not be underestimated. The plastic bag levy could be seen as a type of nudge as people still had a choice as to whether to use plastic bags but were heavily encouraged to use other means. The implications of this intervention are intriguing: a heavy-handed approach has caused a dramatic change in the shopping behaviours of the Irish people. However, would a financial incentive be enough to encourage responsible recreational behaviour in Ireland?

As seen in numerous studies, the use of a financial incentive or disincentive can be a double-edged sword, particularly if the incentive is removed (Gössling, 1999; Wunder, 2000; Cialdini and Goldstein, 2004). Economic incentives have been a somewhat successful means to engender environmentally responsible behaviours. The use of financial incentives has aided in the development of tourism and caused a reduction in the destruction of natural resources as well as allowing access through private land in developing countries (Wunder, 2000; Kiss, 2004; Wishitemi et al., 2015). However, this approach has been refuted by some researchers as an

inadequate solution to the problem due to the operational, structural and cultural problems with the development of ecotourism in developing countries (Cárdenas-Torres, Enríquez-Andrade and Rodríguez-Dowdell, 2007; Das and Chatterjee, 2015).

The third intervention was concerned with alcohol misuse in Ireland and focused on a smaller population while also utilising education and awareness to change behaviour. It is an interesting contrast to the earlier examples. The intervention results indicate no statistically significant difference between the intervention and control groups in relation to most of the projected outcomes of the study (O'Farrell et al., 2017). While there were some positive outcomes, the intervention design had several limitations that made the achievement of objectives difficult to both obtain and quantify. The question is whether the intervention design is best suited to achieve the intervention objectives and, if not, what intervention techniques could be used to fulfil objectives. This emphasises the need for clarity of purpose in the intervention design process.

Even though the intervention proved ineffective in curtailing the levels of reported alcohol consumption, the intervention had an effect on the level of reported alcohol-related harms (O'Farrell et al., 2017). This might indicate that, while the intervention design may not have been fit for purpose, it did have a positive effect on participant behaviour. It could be suggested that the intervention may have caused the participants to pay more attention to their behaviour while drinking instead of paying attention to the level of drinking. This could be of particular interest to researchers in outdoor education since the aim of such research is not to limit the amount of time a person spends in the outdoors. Instead, the aim of many studies in the field of

recreational ecology is to monitor and influence a person's behaviour while enjoying the outdoors.

2.8.2 Interventions from Other Countries

Until this point, the cases of behavioural interventions have focused primarily on examples from Ireland. This was necessary as many studies have attested that one of the main factors controlling the success of interventions is a working knowledge of the target audience (Marion and Reid, 2001; Jenkins and Pigram, 2005; Zimmerman et al., 2014; Michie et al., 2015). This does not mean that research from other countries should be discounted. In fact, it is in learning from other countries that gaps in relevant literature can begin to be addressed. The following sections examine interventions and research conducted in other countries aimed explicitly at changing behaviours in the context of outdoor recreation.

As discussed previously, the negative impacts of outdoor recreation are often not immediately tangible. Moreover, the impacts from multiple users at different times can be cumulative and can have long-lasting effects (Sime, 1999; Müllner, Linsenmair and Wikelski, 2004; Kiss, 2004; Manning, 2007). Combined with the range and diversity of recreational activities that can occur in the same recreational area (for example, walking, running and cycling), land managers are faced with a number of challenges in order to encourage responsible recreational behaviours in a population of many different groups who may have different agendas.

Direct Management in Norway

In recent decades there has been significant growth in outdoor recreation in Norway. As such, management officials have noted an increase in negative impacts that

correlate with the number of visitors to these areas (Skår, Odden and Vistad, 2008; Skår and Vistad, 2013; Michie et al., 2015). The first case examined visitor responses to direct management interventions in Norway (Vorkinn, 1998). The Norwegian Outdoor Recreation Act (Friluftsloven) is based primarily on the principle of common access (*allemansrätten*), which entitles unrestricted foot access for all people to wilderness areas (Haukeland, 2011; Skår and Vistad, 2013). In this Act, a wilderness area is regarded as an area that has not been cultivated. There are still localised regulations, particularly in relation to the activities that can be carried out in national parks. Aside from this, access to natural wilderness areas is relatively unrestricted. What makes this intervention significant is the issue of imposing regulations and changing the behaviours of a people which seems to be in direct contrast to their traditions and culture.

There has been an increase in negative impacts that correlate with the number of visitors to these areas as a result of the growing popularity of outdoor recreation and tourism in Norway (Skår, Odden and Vistad, 2008; Skår and Vistad, 2013; Michie et al., 2015). In response, there has been increased regulation in these areas in order to mitigate these effects. While there are a number of benefits for a direct approach to behaviour change, many studies attest that direct management should only be used as a last resort (Vorkinn, 1998; Fredman et al., 2009). An example of the use of regulation and the effect this intervention has on recreational behaviour can be seen in Vorkinn's (1998) study. The study focused on the effects of regulations in a Norwegian nature area. Regulations that were introduced restricted camping outside commercially designated campsites, ''wild camping'' was prohibited within 100 m on both sides of the roads in the area. The intervention included the blocking of some road exits with large rocks. In addition, 35 signs announcing restrictions on camping

were placed along the main road throughout the area (Vorkinn, 1998). Land management allowed camping on six minor sites designated in addition to a few others.

The intervention had several impacts, one of which was that several camps were no longer available, a number of campers needed to move their camps to an area they had not used before. Although direct management has been used before, for example, in the United States, the cultures between the United States and Norway regarding rights of access are quite different which could have unintended consequences on direct management interventions (Trafimow and Borrie, 1999; Marion and Reid, 2007; Kaiser, 2008; Steg, Van Den Berg and De Groot, 2013).

Indirect Management in the United States of America

The second case to be introduced focused on the United States. Since the late 1950s, the popularity of outdoor recreational activities such as backpacking, hiking and camping has surged in the United States (Marion and Reid, 2001). The number of visitors to national parks in 1950 was approximately 33 million people while the number of visitors to national parks in 2014 was over 292 million people (U.S. National Park Service, 2019). The Petrified Forest National Park, which was founded in 1906, attracts hundreds of thousands of visitors every year (Manning and Anderson, 2012). While it is estimated that only a small proportion of visitors to the park elect to take some of the petrified wood as a souvenir (less than 3%), the cumulative removal of wood by so many visitors has a detrimental effect on the forest. While the park still uses regulation to try and discourage theft of the wood in the form of fines (up to $350), in recent years there had been a number of attempts to change the depreciative behaviour at the 'petrified forest'. Justification for the use

of regulation stems from behavioural change theory (Trafimow and Borrie, 1999; Kaiser, 2008; Taff, 2012). By using a multi-pronged method, interventions can target a population in a number of different ways, all with varying levels of success, for instance, an intervention that targets social norms may be more effective on some visitors compared to others. Additionally, an intervention may target the attitudes towards the behaviour, and this may impact another group of people; therefore, using both interventions may have more impact than the use of a single intervention.

One of the principal methods to discourage theft of petrified wood in Petrified Forest National Park was a multitude of differently worded signs throughout the park. By using these signs, the officials attempted to change the public perception of wood theft. Furthermore, they increased the visibility of both uniformed volunteers and park rangers to increase the presence of authority in the area. These interventions have been noted as significant in reducing the damaging effects of recreation both in the park and have been evidenced in other studies (Marion and Reid, 2007; Kaiser, 2008; Steg, Van Den Berg and De Groot, 2013). In fact, former visitors began to return the fossilised wood after hearing about the campaigns. Unfortunately, the park officials are unable to return the wood to its rightful place. Instead, the Rangers have created a display of all the wood pieces that have been returned accompanied by the written apologies from previous visitors in the hopes of deterring future would-be thieves.

Intervention Outcomes

The direct management intervention examined in Vorkinn's research in Norway has several interesting points (Vorkinn, 1998). The use of regulation appears to have reduced the number of camps found outside of designated areas (Vorkinn, 1998).

However, the intervention seems to have had additional effects. The intervention seems to have changed the composition or type of visitors that stay in the area. These visitors are suggested by Vorkinn to be less affected by human disturbance in the area. This could suggest that although the intervention stopped illegal camping somewhat, the more environmentally aware recreationists have been discouraged from staying in the area. As discussed previously in this chapter, numerous studies indicate that much of the damage done by outdoor recreation is done by uninformed and careless actions (Reid and Marion, 2003; Manning and Anderson, 2012). By alienating environmentally conscious campers, the risk of negative impacts in these camping locations may increase. Additionally, restricting access to camps in areas has been shown to have little to no effect on people who aim to engage in illegal behaviour.

It could be said that by discouraging the law-abiding citizens, there is more opportunity for illegal behaviours to be undertaken (for example, poaching and theft) (Vorkinn, 1998; Skår and Vistad, 2013). Another interesting factor was the effect the intervention had on the existing users of the area. The study illustrated that the satisfaction levels observed in the area seemed to decline as a direct response to the intervention, particularly with visitors who developed emotional connections to the area (Kaltenborn, 1997; Vorkinn, 1998; Ramkissoon, Weiler and Smith, 2012).

This study serves as an example of the impact that direct management interventions can have in an area. While the study did report success in reducing the number of undesignated camps, there were a number of secondary impacts that changed the behaviours and perceptions of recreationists that could not be predicted. It illustrates how vital proper consultation and planning are for interventions, particularly in terms

of longevity and enforcement. This study is an example of a paternalistic intervention conducted by a higher power that worked contradictory to the opinions and culture of the local communities. The temporal effects of this intervention could have outcomes that are unpredictable (Kaltenborn, 1997; Bjerke, Thrane and Kleiven, 2006; Vesterinen et al., 2010; Schütz and Myklebust, 2016).

A contrast in intervention outcomes is found for the case of the Petrified Forest National Park in the United States, which is a complex and noteworthy example. It highlights the difficulty of reducing behaviours in what is only a tiny proportion of the population and the change from direct to a more indirect management position of park officials (Marion and Reid, 2007; Kaiser, 2008; Steg, Van Den Berg and De Groot, 2013). There are numerous examples of less intrusive interventions being conducted in the hopes of protecting the environment (Manning and Anderson, 2012). Examples of these interventions include the promotion of education, signposting and the use of volunteer rangers. These interventions work to protect the environment while at the same time ensuring the recreationist enjoys the freedom of the outdoors. The promotion of environmental messages and education has become a popular tool in recreational ecology and environmental psychology (Manning, 2007; Madden, 2009). Numerous scholars attest that by informing the public and by providing education, the opportunity for behavioural change increases (Christensen and Cole, 2000; Jensen, 2002; Marion and Reid, 2007)(see Section 2.5.3).

2.8.3 Summary of the Application of Behavioural Interventions

The intervention examples discussed highlight a number of points. Behaviour change is not a simple thing to understand and is indeed multifaceted. Although there have been many attempts to change behaviour in a variety of contexts, a gold standard

method has not been found. In the case of alcohol consumption in Ireland, a limitation of the study was found in changing the parameters in the design process (O'Farrell et al., 2017), which could have resulted in poor performance of the intervention.

Legislation and financial incentives have been used in the past, and both have been found to induce the desired behaviour. In other areas, economic incentives such as the pricing policy have been used to reward consumers who purchase "green products" such as electric cars (Mairesse et al., 2012). Mairesse, et al.'s paper illustrated that, although price was a factor in whether someone bought an environmentally friendly car, other factors such as quality, social perception and the reputation of eco-friendly products were also determining factors (Mairesse et al., 2012). Similarly, economic incentives alone are not a viable solution to the negative impacts caused by outdoor recreation as reputation, attitudes and social norms continue to play an important role in behaviour.

If economic incentives are not enough to induce environmentally responsible behaviour, then punishment by authority figures can be used. The United States Federal Government initially used regulations as a means to mitigate negative impacts and curb irresponsible behaviour. Regulation can be an effective measure to instil behavioural change, particularly in the short term (Wunder, 2000). Social norms that are widely agreed upon and accepted by society can be written into administrative rules, public policies and even laws (Manning, 2007). From an Irish perspective, the use of regulation has become significant in recent years as land usage rights and access to private property continues to be a significant issue between landowners and outdoor recreationists (Comhairle Na Tuaithe, 2006; Madden,

2009). Regulations that guard the rights of landowners and protect them from wrongful liability have been a major focal point for Comhairle Na Tuaithe (2006). However, research has shown that such methods do not work, particularly for long-term behaviour change (Cole, 1989; Manning, 2007; Steg, Van Den Berg and De Groot, 2013).

In countries such as Ireland, the UK, Denmark, Iceland, Belgium, the Netherlands and Luxembourg, the development of outdoor recreation has been a key component of the discussion regarding afforestation (O'Leary, McCormack and Clinch, 2000; McCarthy, Matthews and Riordan, 2003). The establishment of new recreational areas can be a means to gather support for the development of forestry in an area. However, when an area has been established and has achieved significant coverage, local populations are reluctant to see the local forested areas being cut down. The increasing growth in recreational demand, as well as a dislike of a lack of biodiversity in tree species, can be a significant component in the development of afforestation in Ireland. Conflicts can arise through the conflicting interest into what the forest functions should be (e.g. recreational facilities, wood production, land beautification, carbon sink and buffer zones) in addition to the growing environmental concern (O'Leary, McCormack and Clinch, 2000).

Some of the main challenges for officials are the aesthetic enhancement of planted forests and the development of urban green spaces (Thompson, 2002; Chiesura, 2004; Buchecker and Degenhardt, 2015). The use of regulation and a top-down approach to policy implementation has been met with significant pushback, particularly in Ireland (O'Leary, McCormack and Clinch, 2000; Ní Dhubháin et al., 2009; Hynes, Norton and Corless, 2014). This suggests that in the pursuit of long-

term behaviour change, authorities in the future must look beyond rational determinants of behaviour and consider communication and educational strategies.

In summary, there are a number of strategies used in intervention design, each with strengths and weaknesses. Selecting the most appropriate method requires a significant amount of knowledge of the sociological and cultural aspects of the target audience (Rimal and Real, 2003; Lee, Jan and Yang, 2013; Burger and Caputo, 2015).

2.9   Theoretical Framework Design

The weight of research previously conducted on behavioural theory and the application of theory is substantial. These theories have been utilised in a range of behavioural interventions across a number of disciplines (Holder, 2006; Bandura, 2006; Ogilvie et al., 2011). However, as of yet, there has not been a behavioural theory that encapsulates the needs of land management and behavioural change experts in outdoor recreation.

The fourth objective of this research is to develop and apply a theoretical framework illustrating the factors required to engender environmentally responsible behaviours in recreationists. This section discusses the creation of a pilot theoretical framework using a number of factors that have been discussed throughout the literature review. This framework will be designed to suit the field of outdoor recreation and activity tourism. This framework seeks to demonstrate the factors necessary to engender environmentally responsible behaviours in recreationists. The framework will serve as a foundation for this research, and the methodology of this research will serve as a means to test it.

2.9.1 Initial Framework Design

This section will build upon the strengths of the behavioural theories described in Section 2.7 in order to create a framework that encapsulates their respective strengths while eliminating some of their reported weaknesses. In addition, the initial framework design will allow for the creation of a framework that places recreationists as the focus. In regards to outdoor recreation and behavioural change, the theory of planned behaviour has been cited in a large number of studies (Hrubes, Ajzen and Daigle, 2001; Ellis, 2005; Jenkins and Pigram, 2005; Marion and Reid, 2007; Juvan and Dolnicar, 2014). There are several useful aspects of the theory of planned behaviour, particularly the expression of relationships between different motivators for behavioural intention. A visual representation of the TPB is given in Figure 2.4.

One of the most notable differences in the theory of planned behaviour and the pilot/theoretical framework developed here can be seen in how the determinants of behaviour are categorised. The TPB attempts to summarise the normative beliefs of behavioural intention into a single category along with subjective norms and perceived behavioural control. The research suggests that the coalescence of such a large variety of factors into a small number of headings may ignore some of the complexity of human behaviour and allow for a missed opportunity in intervention design. This research postulates that a framework that allows for variability in its application would be more suited in the context of behavioural change for recreationists. As such, an initial framework will be designed to incorporate a broader range of factors that may, according to the literature, influence behavioural intention. The application of behavioural change theories in interventions tends to

focus on the individual instead of the world around them. However, aspects of the SCT and the TPB emphasise consideration of the local environment in which an individual is situated. As such, the design of a framework should consist of external factors as well as internal factors in order to accommodate this concept. These factors will be incorporated based on their usage in behaviour change research to date as well as their applicability to the context of outdoor recreation.

2.9.2 Internal Factors

The initial internal factors emerging from the literature to be included in the proposed framework are listed in Table 2.2. The use of attitude in behavioural change research has been well documented and has been discussed in Section 2.7. Several studies advocate that attitude should be considered as distinct from knowledge. The reason for this separation stems from a number of factors, with the main factor being the relationship between knowledge and attitude. For instance, many people are aware of the health risks associated with certain behaviours (for example, drinking and smoking); however, these behaviours are not only viewed favourably by a large number of people, but entire cultures can also be defined on their positive attitudes to these behaviours. In a similar context, most people are aware that littering is harmful to the environment, yet it still occurs on a regular basis in outdoor recreation. The research suggests that knowing information about behaviour is different from the attitude towards that behaviour; as such, a framework should be designed to include both factors.

Table 2.2 Internal factors for proposed framework with reference list

Factor	References
Attitude	(Kollmuss and Agyeman, 2002; Thøgersen, 2004; Kelly, Tovey and Faughnan, 2007; Biel and Thøgersen, 2007; Oates and McDonald, 2014; Juvan and Dolnicar, 2014; Higham, Reis and Cohen, 2015)

Knowledge and Skills	(Dyck et al., 2003; Ellis, 2005; Daniels and Marion, 2005; Dolan and Galizzi, 2015)
Social Norms	(Trochim, 2001; Ellis, 2005; Vagias, 2009; Mairesse et al., 2012; Baumeister and Bushman, 2013)
Perceived Behavioural Control	(Bandura, 1994; Ajzen, 2002a; Bandura, 2004; Kraft et al., 2005; Anderson, Winett and Wojcik, 2007; Billari, Philipov and Testa, 2009)
Past Behaviour	(Ajzen, 2002b; Godin et al., 2004; Ajzen, 2011; Gentin, 2011; Kurz et al., 2015; Lavelle, Rau and Fahy, 2015; Lauren et al., 2016; Acampora et al., 2017)
Demographics	(Bjerke, Thrane and Kleiven, 2006; Kelly, Tovey and Faughnan, 2007; Hynes, Norton and Corless, 2014; Chiu, Lee and Chen, 2014; Oates and McDonald, 2014; Higham, Reis and Cohen, 2015)

Social norms can be a powerful motivator of behaviour and have been identified in several behavioural theories. Its inclusion in the proposed framework is heavily influenced by other theories as well as the need to examine its effect on behavioural intention. It could be argued that social norms should possibly be considered an external factor. However, social norms are described by Steg, Van Den Berg and De Groot (2013, p.186) as "the extent to which a person believes that others would approve or disapprove of the behaviour". So even though social norms are conceived externally, the pressure to conform to social norms is very much an internal factor for the purpose of this research.

Perceived behavioural control has been included in the preliminary framework design on the basis of its popularity in the literature and in the behavioural theories described earlier. A person's belief in their ability to perform a behaviour is a critical concept in behavioural change research and needs to be examined in more detail.

Past behaviour is an exciting concept: it has been contested and debated in the literature on its usage (Thøgersen, 2006; Fundukian and Wilson, 2008; Dunn, Resnicow and Klesges, 2006; Dolan and Galizzi, 2015). Another exciting aspect of past behaviour is the formation of habits and the spill-over of behaviours which has

been reported in a number of studies relating to outdoor recreation management (Thøgersen, 2006; Whitmarsh, O'Neill and Lorenzoni, 2011; Lavelle, Rau and Fahy, 2015). Although behavioural interventions have been reported to be successful in the short term, the maintenance of a behaviour change has been a challenge (Kwasnicka et al., 2016). There has been concern in the literature regarding the relapse into past behaviour after an intervention has taken place. A study by Kwasnicka, et al. (2016) highlighted the importance of the maintenance of newly adopted behaviours as pressure to relapse into past behaviour can significantly affect the efficacy of an intervention. This suggests that consideration for future behaviours and the importance of self-regulation are key components of intervention success.

When looking at behavioural change studies, a number of results show variations in the influence of interventions on the basis of demographics (for example, age, sex, marital status and wealth) (Tarrant and Green, 1999; Holder, 2006; Fundukian and Wilson, 2008; Raymond, Brown and Weber, 2010). This is of particular relevance to this research due to the inclusive nature of outdoor recreation which can cater to a plethora of different types of people.

2.9.3 External Factors

In building a theoretical framework from the review of the literature, the external factors to be considered are listed in Table 2.3. Several behavioural theories emphasise the importance of social norms in determining behaviour. However, consideration of the actual relationship between recreationists and land management could be an essential consideration for intervention design. This relates to a number of behavioural interventions in the context of outdoor recreation where the relationship between stakeholders significantly affected the outcome of the

interventions (Raymond, Brown and Weber, 2010; Lee, 2013; Liu et al., 2014; Lee, Jan and Huang, 2015).

Table 2.3 External factors for proposed framework with references

Factor	References
Relationships	(Davenport et al., 2002; Rhodes and Courneya, 2003; Kyle, Mowen and Tarrant, 2004; Fitch and Ravlin, 2005; Aminrad et al., 2013)
Law and Enforcement	(Allwright et al., 2005; Sorice, Flamm and McDonald, 2007; Skår and Vistad, 2013; Schütz and Myklebust, 2016)
Access and Facilities	(Mountain Meitheal, 2003; Nanang and Hauer, 2008; Gentin, 2011; Pietilä et al., 2015)
Culture	(Hammer, 2008; Wang, Bickle and Harrill, 2010; Berry et al., 2011; Warde, 2014)

A theoretical framework focused on outdoor recreation should consider the range of stakeholders to be addressed. A stakeholder is described as "anyone who any group or individual who can affect or is affected by the achievement of the organisation's objectives" (Freeman, 1984, p.46). One of the exciting things about outdoor recreation is the variety of recreational activities that can take place in the same area. A framework that ignores the relationships between its factors could suffer in its application as a consequence, which is discussed in the literature (Welford and Ytterhus, 2004; Convery, McDonnell and Ferreira, 2007; Libosada Jr, 2009; Ní Dhubháin et al., 2009; Haukeland, 2011; Imran, Alam and Beaumont, 2014).

As discussed in Section 2.5.1, legislation has been used in the past to induce behavioural change in outdoor recreationists with mixed results. There is a general consensus among researchers that low impact practices are more suitable to induce long-term behavioural change in recreationists. A suggestion could be made that a multifaceted approach that focused on less intrusive practices working in tandem with the production and enforcement of regulations could be more beneficial than using either method separately. This idea has been discussed in the literature and put into effect in the case of the smoking ban in Ireland, which was discussed in Section

2.8.1 (Allwright et al., 2005; Fong et al., 2006; Sorice, Flamm and McDonald, 2007; Skår and Vistad, 2013; Schütz and Myklebust, 2016).

Culture is an intangible concept that can be the cause of positive behaviours as well as negative (Berkowitz, 2005; Hammer, 2008; Sayan et al., 2013). The perception of culture was identified as an internal factor previously. However, culture may also be an external factor. A person's attitude towards culture as well as the cultural setting in which a framework is to be applied requires consideration. Cross-cultural boundaries have been a significant factor in the implementation of behavioural interventions in the past, particularly in relation to outdoor recreation (Bandura, 2002; Berry et al., 2011; Serenari, Bosak and Attarian, 2013; Sayan et al., 2013). The appreciation of culture and how it influences other external and internal factors requires further investigation.

2.9.4 Temporal Component

Building on SCT (see Section 2.7.5), there is support for the use of the agentive perspective. This works in tandem with the transtheoretical model of behavioural change. Both frameworks work with the consideration of time. Behavioural change, for the most part, is not a static process. As a person's attitudes and perceptions of the world can change over time (Ajzen and Fishbein, 1977; McCluskey and Lovarini, 2005; Sorice, Flamm and McDonald, 2007; Raymond, Brown and Weber, 2010), an intervention should be designed with a temporal consideration.

The literature suggests that human beings can make rational choices rather than reacting to environmental stimuli, and, if this is the case, a framework should be developed to act as a guide rather than a restriction. Humans are capable of setting

goals and changing their behaviour in stages to meet those goals (Bandura, 1994; Thøgersen, 2006; Borland, 2014). A framework should consider behavioural change as a more cyclical process as described by the TTM and SCT. The inclusion of time into a framework should allow for adaptation and evolution of behavioural interventions.

2.9.5 Building the Framework

This section examines the incorporation of the previously described factors into a framework that can be tested using the methodology described in Chapter 3. The analysis of the collected data will allow for the evolution and refinement of the theoretical framework. The framework, which is presented in Figure 2.6, will aid in the structure of the methodology and findings of this research.
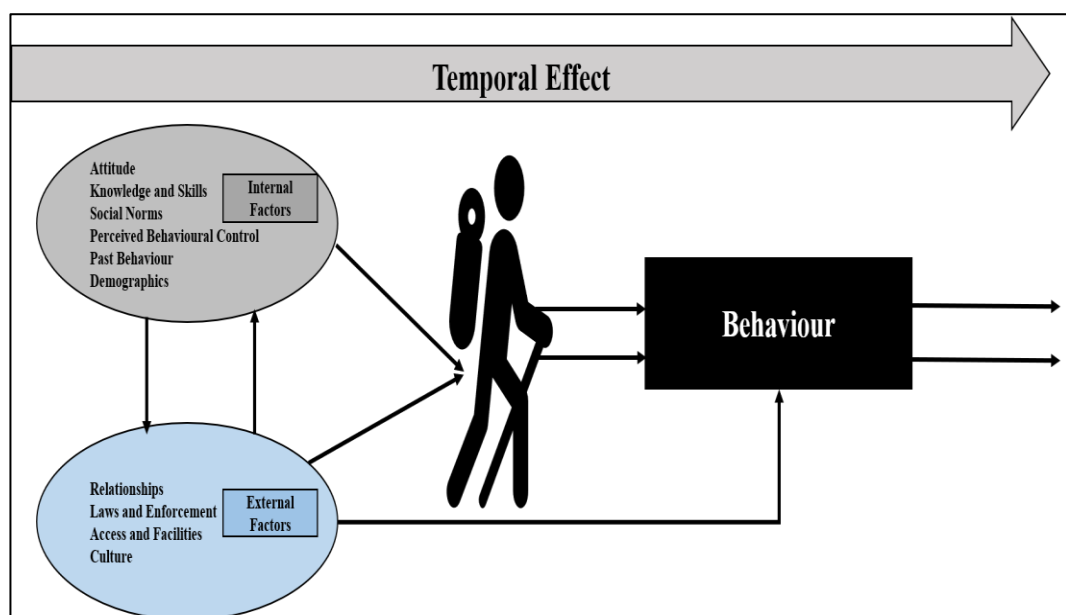
Figure 2.6 Emerging theoretical framework illustrating the factors necessary to engender behavioural change in outdoor recreationists

The proposed framework is designed based on TPB, SCT and TTM as well as the other reviewed literature. It attempts to incorporate their respective strengths while at the same time mitigating the relative weaknesses identified in the literature

(Sections 2.7.4, 2.7.5 and 2.7.6). This framework is a culmination of an extensive literature review across multiple disciplines regarding behavioural change. The framework incorporates a number of the most important components of behavioural change research, the framework adds structure which allows for the investigation of these components to be conducted and analysed.

The internal and external factors can be seen to influence the motivation of an individual to perform a behaviour, which is similar to the TPB. These factors, in turn, can have an influence on each other, for instance, social norms may have an effect on the influence of attitude towards behavioural intention. In addition, the internal and external factors can be seen to interact with each other, which indicates that a person is both a product of their environment while at the same time a factor in the environment. This is similar to SCT. For example, the quality of facilities in an area could affect how a person feels like they need to act.

The external factors can also be seen to influence the actual behaviour, which illustrates the real-life context of which factors outside an individual's control can affect the outcome of behaviour. For example, the heavy use of regulation and enforcement can affect behaviour regardless of behavioural intention, and this needs to be considered. The arrows in Figure 2.6 indicate that the relationships represent a two-way dynamic. A relationship between factors could lessen or amplify a factor's influence on behavioural intention. In addition, behavioural intention can be positively or negatively influenced to perform a particular behaviour.

The temporal component illustrates that passage of time, it suggests that for any specific moment in time, behavioural intention can be influenced by different factors.

In addition, consideration must be shown towards the practising of behaviours in the future, as factors that influenced behavioural intention in the first instance may or may not be as effective in the future. This is illustrated with the use of two arrows. The incorporation of time, which is influenced by the TTM, demonstrated the iterative process that is behavioural change, this concept is supported in the literature as research has highlighted the potential to relapse into previous behaviours without behavioural support and self-regulation (Kwasnicka et al., 2016). By incorporating time, a person's behaviour may have an influence on future behaviours as well as the respective strength of both internal and external factors.

2.10 Chapter Summary

A review of the literature has suggested that behaviour is a multi-faceted construct, with many factors that are interrelated with each other and themselves (Ajzen, 1991). In addition, there are a number of already established theories that have attempted to predict and change behaviour, with varying degrees of success. The literature review has demonstrated that although these theories have their strengths, there seems to be a reluctance to adopt new factors into established theories. This could lead to the ineffectual design and application of behavioural change interventions which are not fit for purpose. Furthermore, there seems to be a level of confusion about how a behavioural change theory should be evaluated and how to determine if a behavioural intervention is successful. With the complex issue of behavioural change and the full range of contexts in which outdoor recreation can take place, the literature review justifies the need for this research. Review of the literature has displayed evidence that suggests the development of sustainable outdoor recreation and tourism facilities requires a deeper understanding of culture and local communities. The

implementation of policies and communication with local communities without prior knowledge of them or using ad hoc strategies can severely hinder their success and sustainability. The next chapter will discuss the methodological approach chosen to achieve the objectives of this research.

Chapter 3:   Methodology

3.1   Introduction

This chapter examines the methodological approach adopted for this research and the practicalities of its application. The aims and objectives of this research are noted in order to frame the chapter. The chosen research epistemology is discussed and justified. The methodological phases of this research are examined in sequence to add clarity to the structure of the chapter. The four main objectives of this study were to:

- examine the attitudes and behaviours of outdoor recreationists in Ireland regarding environmentally responsible behaviour
- review the evolving theories relating to behavioural change
- investigate the efficacy of strategies used to achieve behavioural change in a range of contexts
- develop and apply a theoretical framework illustrating the factors required to engender environmentally responsible behaviours in recreationists.

Given the complexity of understanding the determinants of human behaviour and the multifaceted approaches and theories that have been used in the past to change behaviour, the methodological approach required a combination of methods to achieve the research objectives. The theoretical viewpoints and research techniques of previous studies are explored and used to justify the use of research tools to achieve the aims and objectives of this research. As a mixed-methods approach was adopted for this study, a detailed examination of the research design, sampling strategy, data collection and analysis on all aspects of the research are discussed separately for the purpose of clarity. This chapter concludes by examining the ethical

issues and limitations of this study.

3.2   Methodological Flowchart

The methodological flow chart shown in Figure 3.1 aids in the clarification of the phases of the methodology and this chapter. This research was a logical chain of practical steps taken when the researcher was faced with new questions and opportunities during the research. The flowchart aids in the description of the methodological approaches used and emphasises the emergent process that this research underwent.
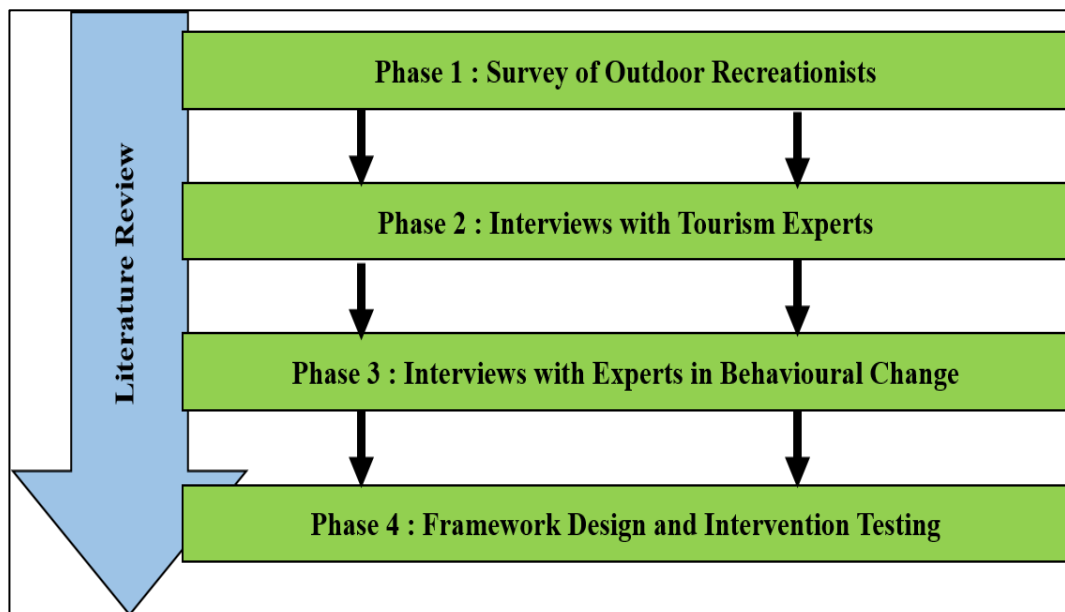
Figure 3.1 Methodological flowchart of research

Phase 1 consisted of a survey of recreationists, which is described in Section 3.4. Building on the data analysis of Phase 1, Phase 2 consisted of a series of expert interviews involving participants in outdoor recreation and activity tourism in Ireland (see Section 3.5). During the collection, analysis and dissemination of data in Phase 1 and Phase 2, the emergence of themes that required more in-depth investigation occurred. It became clear that a series of expert interviews was necessary to

understand the application of theoretical knowledge with real-world examples, and the way in which the two interrelate and affect each other was examined in Phase 3 (see Section 3.6). Finally, a theoretical framework was developed, applied in a pilot test and evaluated in Phase 4 (see Section 3.7).

3.3 Research Epistemology and Paradigms of Research

In the world of research and academia, the way "gold standard" research should be conducted has been hotly contested for decades (Belk, 2007; Fielding, 2010; Patton, 2015). This researcher always believed in the value of each paradigm and had seen the need for different methods in order to answer different types of research questions. As this research focuses on an extremely complicated and diverse topic, as seen in the literature review, the methods used to address the objectives had to be equally diverse and far-reaching. An argument could be made that a purely quantitative or qualitative study could have been used in order to address the aims of this research, and while that might be the case, the complexity of the topic justified the use of both methodologies.

3.3.1 Pragmatism as a Means of Inquiry

The pragmatic approach is not a new concept to social science: it has been over one hundred years since the emergence of the pragmatic theory of truth (James, 1909). The most basic summary of pragmatism posits that "a statement is true if it works" (Seale, 2012, p.20). By adopting a pragmatic method of inquiry, we are directed to search for practical and useful solutions to difficult problems or, at the very least, shed some light on a particular issue. This research, as well the area of social science and behaviour in general, should benefit greatly by the principles of

pragmatism. Instead of quarrelling over the nature of truth, pragmatists work on the outcomes of action. Rather than sticking to and making exceptions in order to adhere to the "pure" or gold standard paradigms, theory or fixed design, a pragmatic approach makes decisions based on the situation and opportunities that can emerge as a result of an inquiry (Patton, 2015). The philosophy of pragmatism has been influential in the justification of mixed methods research.

3.3.2 Mixed Methods Research

This research focused on sequential MMR, of which triangulation using different types of data was a key component. The quantitative survey was conducted first (Phase 1), and the analysis led to the design of a template for semi-structured expert interviews (Phase 2). The results of these were analysed and compared to already gathered data to identify similarities and differences between stakeholder groups. Building on this research, an examination of behavioural change theories and behavioural interventions was conducted. This was done to highlight the factors most popularly used in behavioural change as well as to understand the implementation of behavioural change theory. To expand upon the already gathered findings and to investigate behavioural change in a range of contexts, a second round of expert interviews was conducted (Phase 3). These interviews focused on the real-life application of behavioural interventions as well as the barriers that can occur. Phase 3 interviews were used to examine the relationships between theoretical frameworks and practical application in relation to behavioural change. Once the data was gathered, a theoretical framework for behavioural change was developed (Phase 4). The final stage of the methodology was the pilot

testing and evaluation of the framework. As this methodology can be described as sequential MMR, this chapter will follow the sequence shown in Figure 3.1.

The concept of mixed methods research (MMR) can broadly be described as the mixing of both qualitative and quantitative methodologies in varying ways and degrees (Jick, 1979; Torrance, 2012; Creswell, 2013). The use of MMR is not to be undertaken lightly and has been the topic of deliberation in the research community for decades (Hammersley, 2008; Modell, 2009; Denzin, 2012). The objection to the use of MMR, as suggested by numerous scholars (Thurmond, 2001; Modell, 2009; Hussein, 2009; Modell, 2010), stems from the view that both quantitative and qualitative methodologies have been founded from two distinct paradigms with different ontological, epistemological and axiological views. This suggests that using mixed methods involves the mixing of philosophical worldviews that are, in essence, contradictory to each other (Jennings, 2010). However, supporters of MMR have defended its use on the basis that using mixed methods enables the researcher to mitigate the weaknesses associated with one method with the strengths of another (Jick, 1979; Thurmond, 2001; Modell, 2009). Grbich (2013) expounds on this point by illustrating the numerous benefits of the use of MMR, for instance, the use of MMR allows the answering of more questions from different perspectives. MMR can be used to enhance the validity of research findings by adding context to back up statistics and, in some cases, can find conflicting results, which open new questions for further study. Although the debate is still ongoing with purists on both sides arguing their points (Johnson and Onwuegbuzie, 2004; Flick, von Kardorff and Steinke, 2004; Denzin, 2012), there was sufficient evidence in the literature from multiple disciplines to support the use of MMR for research from a pragmatic standpoint (Foss and Ellefsen, 2002; Olsen, 2004; Modell, 2005; Denzin, 2012).

Grbich (2013) proposed an explanation regarding MMR design, dividing the use of MMR into two options:

- The qualitative and quantitative data is collected at the same time, with an intermingling of approaches to various degrees (concurrent).
- The collection of qualitative and quantitative data takes place at different times and the methodologies are also kept separate to compare results (sequential).

Additionally, MMR does not need to incorporate distinct methodological paradigms. MMR can occur in research that uses solely quantitative or qualitative methods (Decrop, 1999; Hussein, 2009; Vaivio and Sirén, 2010; Torrance, 2012; Mertens and Hesse-Biber, 2012).

Triangulation was a key component of this research. The use of the term triangulation originates from navigational and land surveying. In this context, it was defined by Flick et al. (2004, p.174) as "the determination of a location by measuring from two known points". The term triangulation postulates that although qualitative and quantitative research methods are different, they can be utilised towards similar aims and objectives. Hill, et al. (1966) have been credited with first coining its use in the literature, yet it was Denzin (1978) who was one of the first to describe the multiple approaches to its use. These approaches to triangulation have been dissected, criticised, defended and reviewed over the last four decades (Thurmond, 2001; Olsen, 2004; Hammersley, 2008; Denzin, 2012; Grbich, 2013). Triangulation and MMR as a grouped approach, however, are not without limitations and challenges. For instance, the application of two distinct methodologies requires a significant expenditure of time and effort in the research design phase due to its complexity (Denzin, 1978; Jick, 1979; Fielding, 2010; Denzin, 2012). The researcher may also have a preferred methodology, and the chance of bias in the data collection and

analysis is a possible threat to the validity of the research (Denzin, 1978; Veal, 2006; Denzin, 2012). To address these issues, the use of robust validation procedures and methodological rigour was necessary, these issues are addressed in Section 3.8. However, this may cause confusion and pressure to an inexperienced researcher (Modell, 2005; Hammersley, 2008). Even with the possible limitations and pitfalls present in the application of MMR and triangulation, there was still enough justification in its use for this research design.

3.4   Phase 1: Survey of Outdoor Recreationists

The quantitative approach used in this research phase consisted of an on-site, user-completed survey which assessed the attitudes and behaviours of outdoor recreationists in Ireland regarding environmentally responsible behaviours. In addition, the topics of trust, communication and the organisation of Leave No Trace Ireland were examined. This provided the researcher with a foundation of data that enabled the development of themes and concepts that were explored further in the qualitative section.

Quantitative research has been at the forefront of research strategies in the tourism industry for decades (Campbell and Fiske, 1959; Webb et al., 1966; Denzin, 1978; Secara, 2010). Evidence of quantitative data in the form of a census even dates back to ancient Greece and the Roman Empire (Harper, 2008). Greener (2008, p.17) provided a definition of the quantitative approach to research as "to be associated with a deductive approach to testing theory, often using number or fact and, therefore, a positivist or natural science model and an objectivist view of the objects studied". The positivist paradigm mentioned by Greener (2008, p.36) has its roots in the works of scholars such as Isaac Newton and embraced a view of the world as

being connected through a series of causal relationships (Jennings, 2010). The positivist paradigm was founded on the objective observation of behaviours or the analysis of numerical data. It is believed that by using numerical data, scholars can generalise observable experimental facts to explain behaviours and make predictions for the future.

The use of survey data has been used extensively in tourism research (Riley and Love, 2000; Davies, 2003; Veal, 2006; Dolnicar, 2015). Its popularity is due to the effectiveness and efficiency in gathering data on the study population as described by Jennings (2010). According to Jennings (2010), surveys are a particularly useful tool for investigating:

- the "who" — the demographic characteristics of the study population (age, gender, economic status)
- the "what" — the activities and destination preferences of the study population
- the "how" — the social and cultural status of the study population.

It was from this data collection and analysis that additional questions, themes and areas of inquiry were conceived and further explored in subsequent research phases. The following sections discuss the sampling design strategy and the data collection instrument used to achieve the aims and objectives of this research.

3.4.1 Phase 1: Sampling

The sampling design employed in this research to obtain a representative sample of the population was a non-probability convenience sample. Non-probability sampling has been described by Kothari (2004, p.59) as "the sampling procedure which does not afford any basis for estimating the probability that each item in the population has of being included in the sample". Acharya (2013, p.332) described non-

probability convenience sampling as "chosen on the basis of the convenience of the investigator. Often the respondents are selected because they are in the right place at the right time". In other words, the researcher chooses the participants for the sample. Sampling, as defined by Jennings (2010, p.443), is "the process of selecting participants, subjects, units or items from a population". From the analysis of this sample, the researcher can make generalisations for the larger population. A sample design is a plan of how the sample from the population is obtained.

Jennings (2010, p.441) defined a population as "the entire group of people, events or things that the researcher desires to investigate". Referring back to the definition of outdoor recreation seen in Chapter 1 by Bell, et al. (2007, p.6). Using this definition, it is fair to assert that anyone who participates in any recreational activity in the outdoors could be considered an outdoor recreationist. This made the creation or use of a sampling frame for this population impossible as there is no useable frame for outdoor recreationists in Ireland. For the quantitative section of this research, the sample population refers to the recreational users of outdoor recreational areas in Ireland.

According to Kothari (2004, p.56), when developing a sampling design, a researcher must consider the following points:

- the type of universe, that is the objects that need to be studied
- sampling units, which can be a geographical unit such as a state or a social unit such as families, clubs or individuals
- the source list or sampling frame, which contains all names of the population and is the defined population from which this sample is drawn from
- the sample size, that is the optimum number of units to answer the objectives with regards to efficiency, representativeness and reliability

- parameters of interest, that is the characteristics of the population that are of interest to the study, for instance, demographics such as sex or age

- budgetary constraints — the cost of a sampling method can have enormous impacts on the size of the sample or indeed, the type of sample used in the research

- the sampling procedure, that is the type of sampling used.

Non-probability convenience sampling has been used in similar areas of research that assess the knowledge and behaviours of participants (Richards and Munsters, 2010; Wang, Bickle and Harrill, 2010; Imran, Alam and Beaumont, 2014; Higham, Reis and Cohen, 2015). Researchers such as Zikmund, et al. (2009), justify the use of convenience sampling when other methods of sampling are deemed impractical. An excellent comparative example of this is a study by Imran, Alam and Beaumont (2014), whose study site was on mountainous terrain. During Imran's study, there was a lack of population data, and the researcher was faced with time constraints that made random sampling difficult. Convenience sampling is also useful for pilot research projects from which subsequent research can then use other research methods (Zikmund et al., 2009). This was relevant to this research as the lack of prior national studies in this area is a challenge, and the plethora of activities that exist under the framework of outdoor recreation would make random sampling impractical.

This choice of sampling design was not without its limitations. For example, the subjective views of the researcher might affect the selection of participants to support the researcher's argument (Kothari, 2004). Furthermore, it was important to consider that non-probability sampling increases the possibility that the sample might not be representative of the entire population and, as such, inferences should not be made

solely based on an individual study (Zikmund et al., 2009). To mediate the possible disadvantages of non-probability convenience sampling, the researcher chose from a range of locations which could host a large variety of recreational activities. In addition, by attending such a variety of locations, the researcher was able to incorporate a range of profiles and demographics in the survey.

3.4.2 Phase 1: Sampling Size

To calculate the approximate sample size, an a priori analysis using the chi-squared goodness of fit test was conducted, the sample size was calculated using G*power statistical software to estimate a sample size of approximately 152 participants. The total number of participants in the Phase One survey was 201 (n = 201). This was calculated in order to achieve a statistical power of 0.8, which is an 80 percent chance of detecting a significant difference in the data when one is exists (Pallant, 2016). There are a growing number of computer software programs that compute these tests and G*power has emerged as one of the most popular (Pallant, 2016). The results of the a priori analysis are summarised in Table 3.1.

Table 3.1 Summary of the a priori test to compute the required sample size for Phase 1 survey

χ^2 tests	Goodness-of-fit tests: Contingency tables
Analysis:	A priori: Compute the required sample size
Input:	Effect size w = 0.3
	α err prob < 0.05
	Power (1-β err prob) = 0.80
	Df = 6
Output:	Non-centrality parameter λ = 13.6800000
	Critical χ^2 = 12.5915872
	Total sample size = 152
	Actual power = 0.8019035

Scholars such as Veal (2006, p.288) outline the necessary criteria for the generation of sample size in a population:

- the level of precision wanted in the results, that is the extent that the results of the survey should properly represent the population from which the sample was taken

- the required detail in the proposed analysis and the type of analysis to be undertaken. As a rule of thumb, the more detailed the analysis, the larger the sample will have to be.

Another limiting factor that can determine the sample size is the budget. Studies have shown that it can be ill-advised and wasteful to spend vast amounts of money on a larger survey when it can be shown to be unnecessary. However, budget restrictions may hinder the implementation of a survey and as such will affect the level of precision in the results and the representativeness of the population from which the sample was taken.

3.4.3 Phase 1: Research Instrument and Survey Design

The data collection tool used in this research was on-site surveys, also known as visitor or user surveys (Veal, 2006). The use of on-site surveys is well documented and is one of the most widely used methods in tourism research (Thapa and Graefe, 2001; Veal, 2006; Vaske and Donnelly, 2007; Thapa, 2010). On-site surveys may either be completed by the participant or the interviewer (Veal, 2006; Jennings, 2010). For this research, the on-site surveys were user-completed (see Appendix A). This allowed the researcher to supply multiple respondents with a survey at the same time, which made the data collection more efficient. However, there is a risk of poor standards in the completion of surveys and a reduced response rate from participants unless properly supervised (Veal, 2006), which could, in turn, lead to bias in the data analysis. To combat the risk of poor response rates and poorly answered surveys, multiple drafts of a questionnaire were developed, and rigorous pilot studies were

used to ensure that surveys were clearly understood and easy to answer. Furthermore, the researcher was always at the location and available to assist. Both the survey design and the pilot studies are discussed in the following sections.

The main principle in the designing of questionnaires or surveys is to identify the information needed to complete the objectives of the research (Veal, 2006; Jennings, 2010). This research aimed to identify the attitudes and behaviours of outdoor recreationists towards the performing of environmentally responsible behaviours. An on-site survey aided in the completion of this objective by providing useful information as described by Veal (2006), including:

- catchment area — where the users of a resource come from. This can be of great benefit to the implementation of behavioural interventions as logistical information can be of vital importance
- user profile — also known as the social demographic profile (Veal, 2006). Similar to catchment area, this information can aid managers to target a particular group or demographic.

The use of demographic profiles is common in research to investigate trends, and it is found in numerous disciplines (Bell et al., 2007; Zikmund et al., 2009; Allen and Vella, 2015). It allows researchers to identify trends in the population as to who uses the resources. The opinions of the user can be another product of the on-site survey.

One of the primary aims of this research was to investigate the attitudes and behaviours of recreationists. This information was of vital importance to this investigation. However, caution was needed when assessing the opinions of users, as this quote by Lucas (1968, p.9) illustrates: "It seems misleading to give equal weight to evaluations by people who are seeking a different type of area or experience". This implies that an interpretation of views and criticisms from people is open to

suggestion and bias must be considered (Veal, 2006). The other consideration is apathy in respondents who do not have an opinion or care about a facility. In fact, scholars suggested that the most common complaint might only be voiced by approximately 10% of participants (Veal, 2006).

Survey Design

A ten-page user completed survey was constructed based on consultation with the literature as well as questionnaires used in similar studies. Outdoor recreational studies are more common in the United States, and the structure used in those studies aided in the design of this survey. Following consultation with and permission from the author, two studies from the United States were used heavily in the design of this research, this allowed for ease of comparison later. Both studies investigated the behavioural intention and attitudes regarding practising Leave No Trace in the outdoors (Lawhon et al., 2013; Taff et al., 2014). Likert response items were used to develop scales for several constructs, including Attitude, Knowledge, Social Norms and Perceived Behavioural Control. While these studies focused primarily on Leave No Trace Practices, the surveys were designed in order to examine responses to the seven principles of Leave No Trace. This research removed the use of the term Leave No Trace and instead used environmentally responsible behaviour (ERB) where appropriate. This was done to remove confusion in respondents as Leave No Trace would not be as well known in Ireland as it is in the United States. (Ajzen, 1991). In addition, a number of statements were used from the study conducted by Motherway, et al. (2003). These statements were originally a set of responses used to measure personnel efficacy and motivation to protect the environment (Motherway et al., 2003, p.66). A set of questions relating to the trust of organisations to produce correct information about the causes of pollution was also taken from this study (Motherway

et al., 2003, p.68).

A ten-page questionnaire seems daunting, particularly from the point of view of outdoor recreationists, for whom many engage with outdoor recreation to relax. To make the process easier for respondents and thus achieve a higher completion rate, the survey was constructed using a series of attitudinal statements. These statements were scored on a seven-point Likert scale which can be completed relatively quickly by respondents. In addition, Likert scales are used extensively in tourism research and other areas (Jenkins and Pigram, 2005; Hussein, 2009; Brownlee et al., 2013; Liu et al., 2014). The survey was not distributed using a tablet or computational device as the locations, weather, and ease of use could have been an issue for the completion of each survey.

Table 3.2 Summary of topics used to create Likert scales in the Phase 1 survey

Topic	Scale Definition	Examples of Statements
Attitude	Statements which discuss the environment in general, as well as the practising of environmentally responsible behaviours, were used to develop an attitudinal scale.	There are more important things to do in life than protect the environment. The balance of nature is very delicate and easily upset.
Knowledge	Statements which would require a specific level of knowledge to answer correctly were used to discern knowledge.	Go to the toilet in a lake, river or stream if there are no public facilities. Drop food on the ground to provide wildlife with a food source.
Social Norms	A difficult topic to examine. Statements which involve groups, society and the opinions of others were used to examine social norms.	I practise ERB because the people I recreate with believe it is important. I get upset when I see other individuals are not following ERB.
Perceived Behavioural Control	Statements which measured perceived difficulty, as well as ownership and self-belief, were used to investigate PBC.	Take away food scraps like crumbs, fruit peels and cores. Sometimes it's difficult to practice ERB.

To reduce the risk of bias in the respondents and to increase rigour in the analysis,

some of the statements were adapted using reverse wording. This allowed the researcher to ask a variety of statements and gain valuable information on the opinions of outdoor recreationists towards Leave No Trace practices and Leave No Trace as an organisation. It also allowed the researcher to examine the influence of attitudes, knowledge, perceived behavioural control and social norms on behaviour as outlined in the theory of planned behaviour. Table 3.2 summarises the topics investigated using the Phase 1 survey. The order of response items presented in the survey was intentionally left irregular to reduce response bias and uniform answering.

3.4.4 Phase 1: Pilot Study

During the construction of this research questionnaire, multiple drafts were created and reviewed by academic peers and supervisors. When a consensus was reached on the language of the questionnaire, the practical aspects were tested using a pilot study. The pilot study took place at Banna Strand, an outdoor recreational location near Tralee, Co. Kerry. This area was chosen for multiple reasons: it hosts a multitude of leisure activities, it is a popular destination with relatively high usage, and it was a relatively short distance away. The pilot had a response rate of 80% (n = 30). Initial drafts revealed that some of the questions seemed too complex to be answered easily using a Likert scale. Furthermore, problems with the size of the text, the structure of statements and the time taken to reply to all statements correctly were revealed. The main findings from the pilot were that respondents might not be able to read the statements on the survey properly if the weather was inclement and some respondents said that it took too long to understand some of the declarations. Modifications were made based on the findings of the pilot, and the final

questionnaire was developed. The survey is available in the appendices (See Appendix A).

A pilot survey is described by Veal (2006, p.276) as a small scale "trial run" of a larger survey. Zikmund, et al. (2009, p.65) described a pilot study as "a small-scale research project that collects data from respondents similar to those that will be used in the full study". They went on to suggest that it can serve as a guide for a larger study or examine specific aspects of the research to see if the selected procedures will work as intended. Pilot studies are used extensively in quantitative research (Greener, 2008; Zikmund et al., 2009; Hynes, Norton and Corless, 2014). The use of a pilot survey can reveal any apparent weaknesses in the questionnaires or the survey methods, which will improve the quality of the methodology and data received. Brace (2008, p.178) describes the value of piloting a questionnaire for testing three keys areas:

- Reliability determines if the respondent can understand the question and answer it freely. It can often happen unintentionally that questions designed by researchers can be overly complex or leading respondents.
- Validity determines if the respondents are capable of answering the question. Is the number of answers supplied sufficient to address the research question?
- Error testing is the finding of mistakes in the survey. Grammatical errors and the absence of keywords can alter the meaning of the question entirely.

3.4.5 Phase 1: Quantitative Data Collection

The data collection period for the first phase of this research occurred in the months of June–September 2016. Sample sites were chosen to distribute surveys (see Table 3.3). These sites were chosen having regard to their ease of access, opening hours, daily visitor numbers and the variety of recreational activities. These sample sites

occurred in many different areas across the country. The complete enumeration of all possible locations where outdoor recreation takes place would be nearly impossible to quantify. In addition, a number of sample sites could not be chosen due to some logistical limitations. It could be suggested that this research may not have sampled typified backcountry locations or alpine areas. However, approximately 90% of outdoor recreation is known as soft recreation (Leung and Marion, 2000; Jennings, 2007; Manning and Anderson, 2012; Adventure Travel Trade Association, 2013). This suggests that focusing on more established recreational areas might reveal a wider portion of the outdoor recreational population. It is fair to say that users of an established recreational area are, by definition, outdoor recreationists (Bell et al., 2007).

It is important to recognise that significant impacts can occur in more remote recreational areas which can be devastating to fragile ecosystems that otherwise do not receive many visitors (Christensen and Cole, 2000; Marion and Reid, 2001; Pigram and Jenkins, 2005; Hammit, Cole and Monz, 2015). However, by focusing on more widely used, easily accessible recreational areas, a more representative sample of outdoor recreationists would be obtained. A future study could focus on more skilled and active recreationists who visit remote areas, which could make an interesting comparison with this research. In addition, participants were asked to identify recreational activities conducted over a period of one month, which would allow more strenuous or infrequent recreational activities to be included. The survey method employed allowed for a mixture of recreationists in both urban and countryside locations to be included and enabled participants of varying recreational activities to be tested.

To increase survey response rates, some outdoor events were visited. This allowed both local and visiting recreationists to be approached. Furthermore, by attending festivals, the survey could be distributed to a broader range of recreationists, such as older people who might not regularly participate in outdoor recreation. At all events, prior permission was obtained to attend and distribute surveys. During large recreational events, the researcher took care to be mindful that the various demographic groups were represented. Surveys were distributed at multiple intervals, and the researcher moved to various locations during such events.

Table 3.3 Data collection sites

County	Name	Event	Activities	No. Respondents (n= 201)
Co. Carlow	Carlow town park	N/A	Walking, dog walking, cycling	13
Co. Carlow	Oak Park	N/A	Hillwalking, dog walking, cycling	22
Co. Carlow	Barrow Way	N/A	Fishing, motor boating, hillwalking, cycling, rowing	20
Co. Dublin	St Stephens Green	"Picnic in the Park" open day hosted by OPW	Picnicking, walking, cycling,	25
Co. Dublin	Phoenix Park	"Picnic in the Park" open day organised by OPW	Walking, dog walking, cycling	26
Co. Dublin	St Anne's Park	Rose Festival	Walking, bird watching, dog walking	24
Co. Wexford	Duncannon Beach	Duncannon Kite Festival	Kitesurfing, walking, picnicking, dog walking, surfing, motor boating	23
Co. Kilkenny	Kilkenny Castle	N/A	Hillwalking, dog walking, cycling, picnicking	30
Co. Offaly	Tullamore/S creggan	National Ploughing Championships	Walking, picnicking, sightseeing, spectating	18

The researcher alone conducted the surveys, respondents were approached by the researcher, who identified himself as a postgraduate student and explained the context of the research and that participation was voluntary. In addition, respondents were told that they could stop at any point. The survey took each respondent approximately seven minutes to complete. After the completion of the survey,

respondents were provided with a container to deposit their survey. No identifying names were used on the survey. Respondents were assured that the data would only be used for analysis and that anonymity would be protected. The response rate for the surveys was approximately 85%.

3.4.6 Phase 1: Quantitative Data Analysis

SPSS was used to analyse the quantitative data. Jennings (2010) notes that SPSS is a popular statistical software package within universities and that it is one of the most frequently used software packages for quantitative data analysis. Demographic characteristics (age, gender, education and recreational activity) were analysed using descriptive statistics, which included frequencies and percentages. Attitude, knowledge and other factors, which are described in the findings (see Chapter 4), were analysed using non-parametric statistics. For instance, 10 attitudinal statements were chosen to measure attitude. These statements were combined, and a cumulative score of attitude was obtained. These factors were also cross-tabulated with demographic profiles to examine relationships across demographics.

Following the collection of data for Phase 1, several factors needed to be addressed to select the most appropriate methods of data analysis. In order to conduct more sophisticated statistical tests, it was first important to combine Likert scales into continuous indices; these indices could then be used in several more advanced tests. The scores for the different factors were standardised so that they may be more easily understood and compared. For example, during the building of a score for pro-environmental attitude, ten attitudinal statements in the survey were used. These statements were scored using a seven-point Likert scale. The scores were combined, and a cumulative score for attitude was obtained. As the scale used to measure

attitude consisted of 10 seven-point response items, a maximum score would be 70 and a minimum score would be 10. The scores were converted to a standard scale of 0-100, higher scores indicate a higher level of agreement towards certain factors. To reduce the risk of bias in the respondents and to increase rigour in the analysis, some of the statements were adapted using reverse wording. For the analysis of the data, responses were transformed in order for positive responses to score higher. This was done across all factors to aid comparisons.

Building on this, non-parametric statistics were used to analyse the data. The efficacy of non-parametric statistics to discern differences among variables is debated to this day. Many studies, however, particularly in social science, cannot justify the use of parametric statistics as it is quite common for the collected data to not meet one or more of the assumptions required (Urbina, 2004; Feng et al., 2014; Pallant, 2016).

There are a number of tests that were used in this research, and these are outlined below, as described by Pallant (2016).

Chi-Squared Test

There are a number of statistical tests that use the chi-squared statistic, including the goodness of fit test and the test for independence. The goodness of fit test or one-sample chi-squared test examines if the observed values in a sample are different compared to hypothesised values in a sample. Categorical variables such as gender and age can be examined in relation to hypothesised values or values from other studies. The chi-squared test for independence is used to examine the relationship between two categorical variables. The test examines the observed frequencies that

occur in each of these categories and compares them to values that would occur if there was no association between variables. In addition, the test for independence is useful for the process of cross-tabulation. Chi-squared tests are used in a number of studies investigating behaviour in health research as well as behavioural change research (Smith et al., 2008; Sjögren, Hansson and Stjernberg, 2011; Pietilä et al., 2015).

Mann–Whitney U Test

This is used to test for differences between two independent groups on a continuous measure, for example, their attitudes towards environmentally responsible behaviours. This test is the non-parametric equivalent to the T-test, the difference being that the Mann–Whitney U test compares medians instead of means by converting the scores on a continuous variable into ranks and then determining if the ranks between the two groups differ significantly. The Mann–Whitney U test does not need to rely on the actual distribution of the ranks like the T-test and has been used in previous studies on social norms. For example, Heywood and Murdock's (2002) study investigates the influence of social norms in outdoor recreational behaviour.

The Kruskal–Wallis Test

Seen as the non-parametric alternative to the one-way between the group's analysis of variance test, the Kruskal–Wallis test allows for the comparison of scores from continuous variables between three or more groups. It is similar in nature to the Mann–Whitney U test. Scores are again converted into ranks, and the mean rank for each group is compared. This is seen as a between-group analysis, which means the different people should be in each of the different groups of the test. A study which

investigates the recreational and management impacts on sand dunes illustrates the use of this test (Kindermann and Gormally, 2013).

Building on these tests, an examination of the relationships between factors was conducted. In order to examine the relationships, correlation analysis was used. Pearson's correlation is designed for interval level (continuous) variables. Spearman's correlation is similar to Pearson's correlation except that it is based on the ranks associated with the two variables under study and is useful when data do not meet the criteria for Pearson correlation (Pallant, 2016). The data did not meet the assumptions for Pearson correlation. Therefore, the non-parametric equivalent known as Spearman's correlation was used. These tests allowed for an examination of the strength and direction of a relationship between two variables.

Reliability and Validity

An important aspect for the analysis of data was to ensure the data was sufficiently reliable and valid. Reliability in an instrument was described by DeVellis (2017, p.49) "as one that performs in consistent, predictable ways. For a scale to be reliable, the scores it yields must represent some true state of the variable being assessed". In order to examine this, Cronbach's alpha was used. This test was used to determine if there was a high level of internal consistency between scales. Internal consistency means that the different scales are all measuring the same latent construct and that there is homogeneity between the scales.

These constructs (attitude) can then be further tested for validity by using various techniques. Unfortunately, there is no single test that can be used unanimously to assess validity (Urbina, 2004; DeVellis, 2017). Instead, a series of validity

procedures needs to be conducted. The term construct validity can be used to subsume the various types of validity, which include:

- content validity

- convergent or divergent validity.

Face validity or content validity examines if each of the scales are related to the construct of interest and if the chosen scales are an accurate representation from the universe of potential scales (Urbina, 2004; Pallant, 2016; DeVellis, 2017). Content validity can be addressed by the use of theory, conceptual framework, literature reviews and discussions with experts in the field. Convergent or divergent validity involves an examination of the correlations amongst scores, that is, are the different scales correctly correlating (DeVellis, 2017).

When deciding the most appropriate way to analyse the data, there are several a number of factors to consider. The type of data collected, and the instrument used can make certain methods of data analysis unfavourable or ill-advised.

Discussion on the Choice of Statistics

All parametric testing uses assumptions about the underlying data, these assumptions should be confirmed or at the very least be assumed with good reason before conducting analysis. If the assumptions necessary for parametric statistics are not met, then the results and inferences made may not be valid. In addition, the tests may be lacking in power when compared to more appropriate tests. Below are several assumptions that are necessary for the use of parametric statistics as described by Pallant (2016, pp.132–135):

- Level of measurement — parametric statistics assumes that data is measured

at the interval or ratio scale. That is, the use of a continuous scale rather than discrete categories.

- Random sampling — parametric statistics assume that the data is collected using a random sample of the population.

- Independence of observation — to use parametric statistics, the observations that make up the data set must be independent of each other. Each observation must not be influenced by any other observation. This could have serious implications for the integrity of the data: it is essential to ensure that the answers of one respondent did not influence the answers of another.

- Normal distribution — for parametric techniques, it is assumed that the populations from which the samples are taken are normally distributed.

Other assumptions can occur depending on the parametric test being used. The assumptions needed for parametric statistics can be challenging to satisfy in practise, particularly in the fields of social science and psychology. There are several avenues of thought on how to proceed when a researcher is faced with this issue. One option is to continue and use parametric statistics, the idea being that the tests are robust enough to work without fulfilling the assumptions.

Another option would be to transform the data using various statistical techniques in order to get data to appear to be normally distributed. There are many instances in social science and, indeed, other types of research, where normal distribution does not occur. In this case, it might be possible to defend the use of transforming the data (Pallant, 2016). The use of log transformation has been used in several studies in biomedical and psychosocial research in which the data is skewed. However, researchers feel that the results received on tests from log-transformed data are not relevant to the original data. A cautionary approach should be utilised in this approach.

The third approach to overcome the assumptions of parametric statistics would be to use non-parametric statistics. Non-parametric statistics are generally less stringent on assumptions regarding the population and its distribution. A possible disadvantage of using non-parametric statistics is that the tests can be less sensitive: tests may be more likely to fail to detect differences in the population that might be there (Pallant, 2016). The useful thing about non-parametric statistics is their versatility and range. In many cases, if a parametric test exists, then there is a corresponding non-parametric test that can be used. Non-parametric statistics have often been used in social science and behavioural change research (Vagias, 2009; Vagias et al., 2014), particularly when dealing with data that use ordinal scales. Since this research uses a significant amount of ordinal scales from a Likert style survey, non-parametric statistics are appropriate.

3.5 Phase 2: Interviews with Activity Tourism and Recreation Experts

The use of qualitative methods has increased in numerous disciplines since the mid-20th century (Walle, 1997; Riley and Love, 2000; Belk, 2007). This is interesting considering the historical popularity of quantitative methodology for the research mentioned earlier in this chapter. This would suggest that scholars and policymakers are now looking for more than just raw data (Manning, 2007). Creswell (2003, p.32) described qualitative research as "an approach to exploring and understanding the meaning individuals or groups ascribe to a social or human problem". If the quantitative approach is useful for investigating "the who, the what and the how" of participants (see Section 3.4), then qualitative research is suited to investigating "the why" (Decrop, 1999; Manning, 2007; Steg, Van Den Berg and De Groot, 2013; Juvan and Dolnicar, 2014).

Qualitative methodology is associated with paradigms of interpretation, particularly in social sciences, critical theory orientation, postmodernism and feminism (Jennings, 2010). These paradigms are grouped together into what is known and used as the holistic–inductive paradigm. This paradigm views the world as consisting of multiple realities and studies the problem as a whole; in contrast, quantitative methods investigate causal relationships, often with the use of statistical analysis.

As the qualitative approach requires a subjective interpretation, it was used to better understand the attitudes and behaviours of stakeholders regarding the practising of environmentally responsible behaviour. One of the main principles of qualitative research is to understand the thoughts, attitudes, and beliefs of people. Followers of the holistic inductive paradigm believe that this is achieved through interaction between researcher and participant as well as empathic understanding (Jennings, 2010). As such, there are some theoretical frameworks to consider for qualitative research and, for the purpose of this study, the focus was on the ethnographical position. This framework is described by Creswell (2013, p.12) as "design of inquiry coming from anthropology and sociology in which the researcher studies the shared patterns of behaviours, language, and actions of an intact cultural group". The use of an ethnographical framework is prevalent in tourism research as it seeks to understand a phenomenon through the opinions of the people (Seale, 1999; Stronza and Gordillo, 2008; Gentin, 2011; Neuman, 2013).

The following subsections of this chapter describe the first stage of qualitative research used for the completion of the aims and objectives of this research. The structure of the following subsections is similar to the approach used to describe the quantitative approach.

3.5.1 Phase 2: Sampling

Data collection, in essence, appears similar between quantitative and qualitative methodologies (Jennings, 2010). However, the difference between quantitative and qualitative methods occurs in the subjective collaboration with the participants as well as the interpretation/reconstruction of the data, which is constantly being revised as the data collection is underway to achieve theoretical saturation (Jennings, 2010; Neuman, 2013). This collaboration and revision of interview topics and discussion allows for the exploration of themes and concepts that would otherwise be impossible in standard quantitative research.

From consultation with the literature and through the analysis of the quantitative data, themes were identified regarding the attitudes and behaviours of outdoor recreationists. These themes were then investigated through qualitative research. The target population was experts in the fields of outdoor recreation and activity tourism based in Ireland (see Table 3.4).

In order to investigate these themes, a non-probability sampling method was used for the selection of participants. The non-probability sampling method employed in this research is known as expert sampling. According to Jennings (Jennings, 2010, p.139), expert sampling involves "people whom the researcher identifies as experts". The experts possess specialised knowledge of the field in question and can make informed opinions or comments. This, in turn, allows the researcher to develop further themes that have been identified in the quantitative data and adds more depth to the analysis. Experts were chosen based on their expertise regarding the outdoor recreation and activity tourism industry in Ireland. In addition, experts from governmental, educational and non-governmental organisations were chosen in

order to obtain an extensive collection of opinions and knowledge. Experts all held positions relevant to this research and were based in Ireland. Interviewees were chosen for their knowledge of the research topic, their willingness to participate and their representativeness of different points of view, which are all important traits required by expert participants (Rubin and Rubin, 2012; Imran, Alam and Beaumont, 2014). A combination of experts from governmental and non-governmental organisations was chosen to discuss attitudes from as many points of view as possible. The following table examines the interviewees in more detail.

Table 3.4 Participants for Phase 2 semi-structured interviews

Interview Participant	Field of Expertise	Interview Method	Label
Interviewee 01	Environmental Organisation: Access and Conservation Officer	In-Person	TRE01
Interviewee 02	Eco-tourism company: CEO	Skype	TRE02
Interviewee 03	Rural Recreation Officer	In-Person	TRE03
Interviewee 04	Recreational Development Agency	Phone	TRE04
Interviewee 05	Outdoor Education Lecturer	Phone	TRE05
Interviewee 06	Environmental Education	Skype	TRE06
Interviewee 07	Sustainable Development Voluntary Organisation	Phone	TRE07

3.5.2 Phase 2: Interviews

The data collected in this phase of the research included the use of semi-structured interviews. Semi-structured interviews, according to Jennings (2010, p.174), lie within the "genre of a conversation", yet it is the responsibility of the researcher to focus the conversation. The researcher is aided by a list of themes that they wish to focus on; however, the order in which their themes are addressed is not rigid. A semi-structured interview is fluid in nature and is meant to follow the thinking process of both the researcher and the participant. According to numerous researchers for the interview to be of high quality, a personal rapport is desired (Thurmond, 2001; Veal, 2006; Zikmund et al., 2009). Jennings (2010) outlines the various advantages and disadvantages associated with the use of semi-structured interviews. The main

benefits of semi-structured interviews are:

- a balance between structure and openness
- they allow the use of prompts for themes to be targeted for further analysis and discussion
- they are facilitated by pre-determined themes.

A negative aspect of semi-structured interviews is that they can be time-consuming in terms of both the interview itself and the transcription process. There are also other limitations in semi-structured interviews. For instance, the settings in which the interview takes place and the data collected may be subjective, the exchanging of knowledge between a researcher and a participant may influence the data, and the impossibility of replication as each interview is a snapshot in time and place between two people. The researcher chose the use of semi-structured interviews as it allowed for a natural, free-flowing conversation to occur as well as the development of themes previously identified. A full list of interview topics for Phase 2 can be seen in Appendix B. The themes were chosen based on the literature review and analysis of Phase 1 data, in conjunction with sequential triangulation. Table 3.5 highlights some of the themes upon which the interview was based.

By using semi-structured interviews, the researcher was able to put the interviewee at ease and, thus, able to enrich the data collection process. In addition, by discussing themes and using prompts, the researcher allowed the participant to express their opinions rather than answering a static set of questions.

Table 3.5 Phase 2 interview theme summary and justification

Theme	Justification for inquiry	Example of Discussion Question
Knowledge of Leave No Trace Ireland	Investigating the reach of Leave No Trace Ireland.	What do you know about Leave No Trace Ireland (LNT)?

Attitude & Knowledge of Recreationists	To compare the self-reported attitudes against the experiences of experts in the field.	In your opinion, what is the current level of environmental knowledge among recreational users, particularly in regard to LNT?
Effect of Demographics	Both Literature Review and Phase 1 analysis suggest demographics possess different levels of environmental Attitude and Knowledge.	In your opinion, is there a demographic group of people who seem to be the worst offenders for environmental impacts?
Major Environmental Issue	Analysis of Phase 1 data indicates uncertainty regards ERB in Recreationists. Needed to investigate the most prolific impacts faced by experts.	What are the major environmental impacts that are affecting the area?
Reputation	Communication and Reputation have been shown importance in both the literature review and the analysis of Phase 1 data.	Has your organisation's reputation affected the implementation of any of your projects?
Behaviours Reflective of Knowledge	Did the experiences of experts in the field, coincide with the knowledge behaviour gap?	Do you think behaviours exhibited by recreationists are an accurate reflection of their knowledge?
Environmental Approaches used	Using their knowledge and experience, what approaches have they used to address the issues.	What Environmental Impact management approach have you used, and have you found them effective?

To mitigate the concerns and limitations listed, a pilot study was conducted to eliminate any apparent problems with themes and to give the researcher experience in the facilitation of these interviews.

3.5.3 Phase 2: Pilot Study

Similar to the quantitative approach in Section 3.4.4, there are numerous benefits to conducting a pilot study before data collection begins (Jennings, 2010; Bazeley and Jackson, 2013). The pilot study allowed the researcher to determine whether the research design would achieve the aims and objectives of this study, estimate the length each interview would take and familiarise himself with the type of participant to be interviewed.

The pilot interviewee was involved with outdoor recreational event planning, and this background was relevant to the research area of interest. Themes that arose from the literature review and quantitative data analysis were discussed. Upon completion,

the interviewee (who had previous experience with semi-structured interviews) gave a review of the interview and advice. Modifications were made based on the findings of the pilot, and the final list of interview questions was developed. A full list of the semi-structured interview topics can be seen in the appendices (See Appendix B).

3.5.4 Phase 2: Qualitative Data Collection

The qualitative data collection occurred in October–November 2016. The interviews were scheduled after the tourist season in Ireland (June–September) (Fáilte Ireland, 2015a). This allowed qualitative data collection to take place when participants were more available, as many of them can be extremely busy during the tourist season. The analysis of survey data identified trends that were integrated and examined in the semi-structured expert interviews. Qualitative interviews are best done in natural settings and at the participant's convenience (Jennings, 2010; Creswell, 2013). An extended interview could put an unfair demand on the participant's busy schedule, which could negatively affect the quality of data collection. Therefore, the data collection was conducted with the convenience of the participant in mind.

While efforts were made to conduct the interviews in person, issues arose with scheduling conflicts and logistics. Other mediums of communication were used, such as Skype and telephone. While physical co-presence in interviewing is still regarded as the "gold standard" of qualitative research (Weller, 2015), there is emerging support for the application of other communication mediums to achieve data collection (Sullivan, 2012; Redlich-Amirav and Higginbottom, 2014; Weller, 2015; Lo Iacono, Symonds and Brown, 2016). An interesting note is that the shortest interview was conducted in person (approximately 20 minutes). At the same time, the longest was carried out over the phone (60+ minutes), suggesting that other

factors like the skill of the interviewer and the reticence or enthusiasm of the interviewee may be more important than a communication medium.

3.5.5 Phase 2: Qualitative Data Analysis

As stated by Jennings (2010, p.21), "research that is informed by a qualitative methodology is grounded in the interpretative social sciences and is inductive in nature". The inductive approach for qualitative data analysis is used to condense data into a summary format, which will allow the establishment of links between the research objectives and data collected. This type of analysis requires the establishment of categories and topics from the transcribed data.

The transcription of the qualitative data was done using NVivo qualitative data analysis software. The use of NVivo allowed for both the secure transcription of interviews and the analysis of transcribed data. The use of computer software for qualitative analysis has become popular in recent years (Flick, von Kardorff and Steinke, 2004; Bazeley and Jackson, 2013; Cawley, Bicalho and Laurrens, 2013). Qualitative analysis often employs the use of general ideas, themes or concepts as tools in which to make generalisations. Coding is described by Strauss (1987, p.27) as "tagging text with codes, or indexing it, to facilitate later retrieval. Naming a concept or topic aids the organisation of data and so assists analytic thinking". In other words, it organises the data collected into themes from which theories can be validated. Codes can come in a variety of sizes and are not restricted to straightforward chunks of text (Jennings, 2010).

Coding typically moves through at least two major stages: the initial stage of identification (open coding) and a second stage of developing themes (theme

development) for more focused analytics (Bazeley and Jackson, 2013).

Open Coding

Open coding is described as the process of breaking down, examining, conceptualising and categorising data (Bryman, 2012). Using this definition, transcripts were individually broken down and categorised into conceptual nodes. The diverse nature of open coding allowed for the conceptualisation of an extensive range of nodes reflecting the opinions and experiences of the expert participants. The nodes from open coding later served in the second stage of coding, namely, thematic development. The coding of Phase 2 data can be seen in the appendices (see Appendix C).

Thematic Development

Building on the initial coding phase, thematic development involved finding links between nodes found in open coding and the development of more selective and encompassing themes (See Appendix C). This stage of coding illustrates the movement away from generating codes that stay "close to the data" to the more selective and abstract conceptualisation of the topic of interest (Bryman, 2012, p.570). Comparisons were made between Phase 1 and Phase 2 data, and links were established between the themes identified in the quantitative data analysis as per sequential MMR, which are discussed throughout the findings of this research.

3.6   Phase 3: Interviews with Experts in Behavioural Change

The earlier sections focused on the factors that can motivate behaviour in a range of circumstances, as can be seen in Chapter 2. While the previously discussed data

collection phases did reveal several interesting points that are discussed at length in the findings, a new inquiry was also conceived from the earlier methodologies combining the researcher's knowledge of behavioural theory and the raw data that were presented. Following the principles of pragmatism and despite the level of research previously conducted in behavioural change in a range of contexts, none of the available theories adequately encompassed the variability of human nature and emotions. In addition, more research was needed to understand the pitfalls associated with behavioural change and to understand the delivery of interventions in a real-world context. Accordingly, the next stage of the research was primarily focused on understanding these motivations and on gaining a better understanding of behavioural change from people working in situ. Once this was completed, the accumulated data from all previously mentioned sources was combined in order to design a framework for behavioural change in the context of outdoor recreation. Finally, a pilot study was designed to test aspects of the framework and to evaluate its effectiveness. The following sections describe Phase 3 of this research in more detail and how the methodology is linked throughout.

In Phase 1 and Phase 2 of the research, the aim was to gain a better understanding of the attitudes and behaviours of outdoor recreationists in Ireland. For Phase 3, the goal was to learn from the experience of experts who have attempted or have conducted behavioural interventions in the past. In order to answer these questions, a qualitative approach in the form of expert interviews was chosen.

From a thorough examination of the literature and from the analysis of the data already collected (see Chapter 4), the researcher needed more information to comprehend the implementation of behavioural change in a range of contexts. The

best way to achieve this was to interview experts involved with behavioural change. Having already gained valuable insight using the methods described in Section 3.5, it was decided that these interviews could be conducted in a similar fashion.

3.6.1 Phase 3: Sampling

From consultation with the literature and through the analysis of previously collected data, several themes regarding the implementation of behavioural interventions were identified. In order to investigate these themes, expert sampling was used for the selection of participants similarly to Phase 2. In order to gain a more representative account of the barriers and experiences involved in the conduction of behavioural interventions, participants were selected from a range of backgrounds and countries. One of the most significant limitations found was the gap between theory and practice. For this reason, a number of the participants were involved in the fields of academia while other participants had a background in more bespoke, hands-on approaches to behavioural change. By combining the experiences of the academic and real-life, a richer and more robust framework could be developed. Experts were chosen based on their contributions to this field in the case of academic respondents. For experts whose experience is more practical, publicity and reputation of previous projects were used to discover suitable participants. Experts all held positions and had knowledge which was relevant to this research.

In addition, elements of emergent sampling were used in order to ensure a representative group of experts which would provide rich data, participants were asked if they knew of any potential expert participants who were relevant to this research. The search for respondents led across Ireland, the United States and New Zealand.

Table 3.6 Participants for Phase 3 semi-structured interviews

Interview Participant	Field of Expertise	Interview Method and Country	Label
Interviewee 08	Research and Project Development for Environmental NGO	Skype, USA	BCE08
Interviewee 09	Academia, Recreation Ecology and Environmental Management.	Skype, USA	BCE09
Interviewee 10	Community and Environmental Engagement	Skype, Ireland	BCE10
Interviewee 11	Social Psychology, Academia	Phone, Ireland	BCE11
Interviewee 12	Environmental Education and Training	Skype, Ireland	BCE12
Interviewee 13	Research & Project Development for Environmental NGO	Skype, New Zealand	BCE13
Interviewee 14	Community and Environmental Engagement	Phone, Ireland	BCE14

3.6.2 Phase 3: Interviews

Similar to Section 3.5.2, semi-structured interviews were used. The justification for their use can be found in Section 3.5.2. This method of data collection was extremely effective in the earlier phase of research. The use of a semi-structured interview allowed the participants to be more at ease with the interview process, which can lead to a more free-flowing conversation. The researcher needed to understand the experiences of the experts with regards to behavioural change as some of these experiences could be negative. Therefore, a rapport needed to be established between the researcher and participants. Similar to Section 3.5.4, pilot testing was conducted prior to the data collection in order to correct mistakes and test for bias. A full set of interview themes and subthemes can be seen in the appendices (See Appendix D).

Table 3.7 lists the main themes discussed in the Phase 3 interviews. Several other topics were also discussed over the course of an interview in order to put the participant at ease and to create more free-flowing dialogue.

Table 3.7 Phase 3 interview theme summary and justification

Theme	Justification for inquiry	Example of Discussion Topic
Major Environmental Impact	In order to understand the attempts at behavioural change, it was	What is the most significant negative environmental impact (Challenge) that you face in your organisation?

	necessary to identify the problem that needed an intervention.	What is the largest/most recent project that you are working on now?
Intervention Design	Descriptions of how an intervention was developed to change behaviour in a range of circumstances.	What approach have you used to date to tackle the problem?
Intervention Evaluation	The literature review indicated that intervention evaluation is a contentious issue. Learning about the experiences of experts on intervention evaluation would be of particular importance for the design of a framework.	Has there been any feedback on the impact of the programme/intervention? What was your biggest challenge that you have dealt with to date?
Lessons Learned	From a review of the literature on behavioural change. Learning about potential pitfalls from experts was an invaluable asset to the research.	When dealing with behaviour change, what has been the biggest learning point from when you started your work, to where you are now?
Behaviour Change	Getting the opinions of experts on the most effective ways to change behaviour.	What do you think is the most effective way to change behaviour?

3.6.3 Phase 3: Pilot Study

An initial interview was carried out with a willing participant. The participant was not aware that it was a pilot, and the questions were analysed to see if there was any apparent weakness or need for additional themes. Any amendments that were necessary were made in relation to the topics.

3.6.4 Phase 3: Qualitative Data Collection

The data collection for this section occurred in a similar fashion to that described in Section 3.5.4. Interviews were conducted in the months of June–October 2018. There were a few differences, however, to the process described in Section 3.5.4. Initially, the researcher found it difficult to get willing participants, particularly from the academic fields. This could have been due to the time of year, when many of those in academic researcher positions might have been away conducting their own research, or the idea of participation did not seem enticing. Eventually, communication opened up with relevant participants and interviews were organised.

Because of the range of behavioural change contexts and experts that spanned across the globe, the direct in-person interview was just not a viable or practical option for this research. Instead, the interviews were conducted using video conferencing software or over the phone in two cases. While there is still debate on the use of these technologies in research, the use of this method is justified on the basis that if forced to do the interviews in person, the researcher would not have been able to combine participants from three different continents and gather as much data across boundaries.

3.6.5 Phase 3: Qualitative Data Analysis

The data was analysed using the methods as described in Section 3.5.5. Through this analysis, the researcher was better informed and able to design a framework for behavioural change, particularly in the context of outdoor recreation in Ireland. This framework is discussed briefly in the next section. A full list of developed codes can be seen in the appendices (See Appendix E).

3.7   Phase 4: Framework Testing and Evaluation

This section involves the adaptation of the theoretical framework and the pilot testing of several aspects related to the framework. Justifications for the addition of new factors can be found in Chapters 4 and 5. Since the pragmatic paradigm posits that research must have some practical use, aspects of the framework were tested.

This section discusses the testing and evaluation of the theoretical framework, which evolved as a result of the analysis of previously collected data. The intervention was tested on a group of 13 students in the Institute of Technology Tralee.

3.7.1 Phase 4: Testing the Framework

The framework seen in Figure 3.2 illustrates the range of factors (both internal and external) that can affect the motivation to perform a behaviour. Combined with environmental barriers and accounting for time, this framework can be used to design interventions to produce long-lasting behavioural change. Figure 3.2 illustrates the framework with modifications as a result of the analysis of the data.
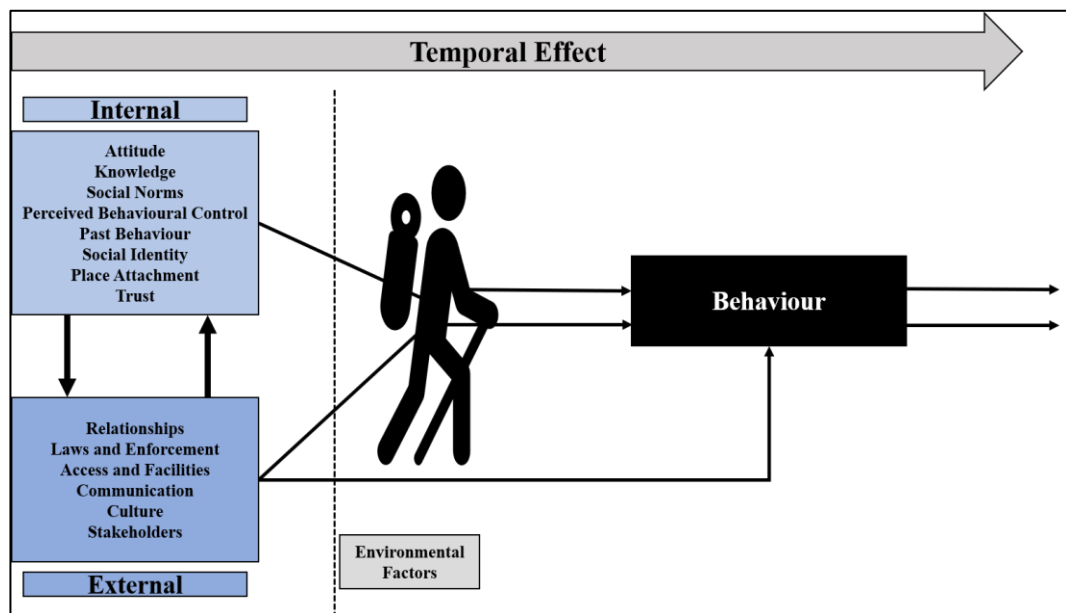
Figure 3.2 Theoretical framework illustrating the factors required to engender environmentally responsible behaviour

If we are to align this research to the pragmatic paradigm, which can be simply summarised as "a statement is true if it works" (Seale, 2012, p.20), then we are tasked to test the efficacy of the framework (Patton, 2015). A major criticism and reason for contention in the field of behavioural change has always been the evaluation of the efficacy of frameworks. Even one of the most renowned behavioural theories such as the theory of planned behaviour has come under criticism in this regard (Armitage and Conner, 2001; Sheeran, Trafimow and Armitage, 2003; Kraft et al., 2005).

In order to test the new framework, a pilot intervention was designed. The use of

interventions that are based on theoretical frameworks are well established in the literature (Michie, van Stralen and West, 2011; Waligo, Clarke and Hawkins, 2013; The Scottish Government, 2015). The use of interventions to test a framework allowed for the analysis, evaluation and possibly adaptation of a framework to occur.

3.7.2 Phase 4: Intervention Design

To test the effectiveness of the framework, an intervention was designed that targeted specific aspects of the theoretical framework. The researcher theorises that the strength of this framework is its adaptability and applicability to various situations. The researcher was limited in resources (time, money, etc.). However, a small-scale intervention that could test elements of the proposed framework was designed. The intervention was based on several factors that arose throughout the extensive methodology to date and how each factor linked to both the framework and other factors.

3.7.3 Phase 4: Intervention Delivery

The intervention focused on a selection of factors from the framework:

- place attachment and social norms
- perceived behavioural control and knowledge
- trust, communication and facilities.

These factors were chosen due to their prevalence in the analysis of collected data to date as well as their representation in the literature. A more detailed explanation of the use of these factors can be found in the findings (see Chapters 4 and 5). The intervention was tested on a group of 13 students in the Institute of Technology Tralee. None of the students had been formally trained in outdoor ethics, and the

students came from a range of age groups/countries. The intervention took place on the 7th of November 2018. Originally, the intervention was to be conducted outside. Unfortunately, the weather dictated otherwise. The intervention was conducted in a similar way to a Leave No Trace awareness workshop. However, changes were made to suit the testing of the framework. The use of active learning allowed fluid and open communication between the participants and the researcher which encouraged the free thought and expression of ideas (Jensen, 2002; Latinopoulos, 2014).

The popularity of education-based interventions used in outdoor recreation is prevalent in the literature (Marion and Reid, 2007; Vagias, 2009). Organisations such as Leave No Trace have developed sophisticated courses that teach environmental education through active learning. By focusing on participation, the possibility of communication, engagement, and knowledge retention can be increased. In addition, active learning allows for self-reflection and personalisation of the topics (Couchman, 2011; Veselinovska and Osogovska, 2012; Derevenskaia, 2014; Torkar, 2014; Freeman et al., 2014; Kuščer and Mihalič, 2019). The researcher could not choose other types of intervention as the limitations of this study did not permit utilisation of signage interventions or the enforcement of regulation. Additionally, analysis of research data seen in Chapters 4 and 5 suggested that an active learning approach is one of the most effective methods of intervention delivery. The intervention focused on factors that interrelated and could be tailored to suit an education-based intervention.

In addition, the researcher was well experienced in the conducting of Awareness Workshops for Leave No Trace Ireland. This experience allowed the researcher to design and tailor a workshop using communication techniques and to increase

engagement with participants. The researcher had also completed the Trainer's Course for Leave No Trace Ireland. The Trainer's Course, which is discussed in Chapter 2 (see Section 2.6.3), is the second tier of the Leave No Trace training structure. It enables the researcher to run and teach tier-one Leave No Trace Awareness Workshops. The following subsections describe each of the activities and their role in the intervention.

Place Attachment and Social Norms— The Ethics Activity

The activity was introduced in such a way as to instil a sense of ownership to participants. When this was done, a series of negative impacts that could occur in the area was described. Participants would then rate and discuss the severity of these impacts and what it meant to them. In doing so, the respondents would think more about the impacts that can occur in "their" environment rather than "the" environment. The literature and the findings presented in Chapter 4 have suggested that place attachment can be a significant influencer of behaviour. If the range of impacts occurs in a place with an emotional connection to the participant, then the opportunity for behavioural change can be increased (Cheng and Wu, 2015). Place attachment, much like social norms, is a complicated yet powerful factor in determining behaviour and as such needs to be incorporated in behavioural change interventions.

Perceived Behavioural Control and Knowledge — The Breakdown Activity

Participants were given a range of potential waste materials that can be discarded by recreationists. Participants were asked to rank them in the order that the materials would break down in the natural environment. Any surprising observations the participants had were discussed with all participants. In doing so, the importance of

having the required skill to responsibly look after waste was emphasised and, furthermore, the researcher demonstrated that doing the right thing need not be difficult. Previous research suggested there is a lack of knowledge regarding the correct course of action for waste disposal in recreationists (Civil and McNamara, 2000; Dolnicar, Crouch and Long, 2008; Serenari, Bosak and Attarian, 2013). With that in mind, this activity not only informed participants about potential pitfalls, but it also empowered individuals to be better equipped to deal with problems in the future.

Trust, Communication and Facilities — The Signage Activity

Participants were presented with a series of different signage examples related to topics such as littering, no access, fines and trespassing. The participants were asked to rate them and to discuss each of them in terms of factors such as effectiveness, preference and detail. Possible design ideas for an effective sign to deter a chosen behaviour (which was selected from the ethics game) was discussed as well as the creation of a sign blueprint. The literature, as well as the findings of this research, have found that traditional signage used in behavioural interventions has had minimal if any success. The use of interpretative signage has been associated with a greater level of success in research (Widman, 2010; Taff, 2012). Communication has been found to be a significant factor in the implementation of behavioural change interventions in the past and is a worthy component of this research.

These topics were the foundation of a series of activities that the participants engaged with. Although they have been listed and described individually, the activities used in the intervention were anything but separate. Throughout the literature review, and in the process of this research, how different factors relate to each other emerged as

a significant factor regarding behavioural change. This intervention was designed so each activity would blend into the preceding activity in order to increase its significance. If the negative impacts associated with irresponsible behaviour can be cumulative (see Chapter 2), then the methods used to address this issue had to be equally interlinked.

3.7.4 Phase 4: Evaluation of Intervention

In order to test the effectiveness of the intervention, a survey with 27 Likert style statements was used. This survey can be seen in Appendix F. The survey was designed similar to the survey described in Section 3.4.3. The statements were designed to test the student's attitudes towards behaviours in the outdoors as well as their knowledge and beliefs about responsibility. Table 3.8 describes the choice of statements used in the Phase 4 Intervention Survey. A justification is presented for the choice of statements as well as examples from the survey. However, there were some differences in how this survey was distributed. In order to test the effectiveness of the intervention, each student was given three surveys. One survey was distributed before the intervention with no introduction, one survey was distributed immediately after the intervention, and a final survey was given one month after the intervention.

Table 3.8 Summary of topics used to create Likert Scales in Phase 4 survey

Topic	Justification	Examples of Statements
Place Attachment and Social Norms	Participants were presented with Item response statements which describe place attachment. These survey questions targeted the underlying emotional attachment that may be present in participants. As a result of the intervention, a change was expected in the answering to these questions as the participant would have been discussing a location that would have a sense of ownership. A major flaw in environmental ethics has been that the environment is seen as an	There is a place I like in which I recreate quite a lot I do not care what other people do in the outdoors as long as it doesn't involve me I get upset when I see other people's rubbish while I am out recreating

	abstract concept. This intervention and survey questions focused the participant on talking about areas that have importance to them.	
Perceived Behavioural Control and Knowledge	These survey questions were included for several reasons. To begin, they are a decent baseline to test the environmental knowledge of participants. Some of these questions can be difficult to answer without previous training or forethought. The emphasis on a large amount of behavioural change research has been the use of education. This intervention focused on creating discussion rather than supplying information. By accessing predetermined notions and beliefs of participants, a dialogue was created, which aided in the retention of information.	Leaving food scraps is Ok because animals need to eat Cigarette butts break down quickly because they are made of paper It is just too difficult for somebody like me to do much for the environment
Trust, Communication and Facilities	These questions were used to judge a participant's opinion on the use of signs and notices in the outdoors. After the intervention, the opinions should change to view signs more favourably, or at least be able to notice signs more frequently. The research into recreation management advocates the use of signage as a means of engendering compliance with regulations. However, signpost design and messaging have been shown in the past to be a significant factor in their effectiveness.	I read signs/notices when I come across them in the outdoors I find signs and notices to be interesting and informative, they help me make decisions about my behaviour

The initial survey was used to establish a foundation of their attitudes, knowledge and beliefs regarding several topics related to the intervention, which are described in the findings (see Chapter 4). This was done in a similar fashion, as outlined in Section 3.4.3. The first two surveys were used to test if the intervention changed the scoring on the surveys before and after the intervention, the use of pre and post testing in the evaluation of educational initiatives has been seen before, (Bogner, 1998; Erdogan, 2015).

The final survey occurred a month later to investigate if these changes (if any) had a lasting impact and if the intervention had any long-term retention. The use of an interlude between surveys in the evaluation of environmental education has

documented previously (Bogner, 1998). The study by Bogner, examined if the efficacy of established environmental education programs could be evaluated using empirical data to test for knowledge retention and changes in behavioural intention (Bogner, 1998). The results of the intervention, the evaluation of the framework and recommendations for the future can be found in Chapter 6 and 7.

3.8 Ethics and Limitations of Research

3.8.1 Phase 1

Ethical considerations are an integral part of conducting research, from identifying the research question, data collection, interpretation and publishing of findings. Ethics are defined by Neuman (2013, p.145) as "what is or is not legitimate to do or what "moral" research procedure involves". When collecting primary data through surveys that involve direct contact with respondents, there are some ethical issues to consider (Neuman, 2013). Some of the main ethical issues that can arise are; the invasion of privacy, the informed consent of participants, the anonymity of respondents and the use of poorly designed or biased surveys.

To mitigate the risk of ethical concern, the survey design was conducted with the respondent's privacy and anonymity as a primary concern:

- All data collected were inputted into a computer system, which was password protected and known only to the researcher.
- No names or personal data were required to complete a survey.
- Every respondent was told that this survey was for an academic postgraduate and that all data would be strictly confidential.
- Respondents were informed of the purpose of the study, and that participation was voluntary.

- Respondents were told that they could withdraw from participating in the survey at any time.

- The researcher alone conducted the surveys, and the researcher was proficient in ethical guidelines.

- Participants were informed of their rights and of the anonymity of the survey responses.

3.8.2 Phase 2 and 3

Similar to the quantitative research, there are some ethical considerations in qualitative research (Jennings, 2010). These considerations are in relation to the participants, the researcher and the research in question and must be resolved before the commencement of data collection (Phillimore and Goodson, 2004). Jennings (2010) outlines some of these ethical issues:

- informed consent (Are participants aware of the purpose of the research? Moreover, is their consent given freely beforehand?)

- privacy (How will the data be stored? How long will the data be kept before they are destroyed?)

- confidentiality (Who has access to the data collected? Will participant's information be included in research findings?)

- harm and risk (Is there any potential risk to the participants? Will the opinions of the participant make them look bad?)

- trust (Is there a good relationship between the researcher and the participant?)

- integrity (Is the research being conducted to a professional standard?)

For the purpose of qualitative data collection and in consideration of the ethical concerns already discussed, the following protocols were put in place:

- Ethical approval was granted by the Institute of Technology Tralee before the commencement of this research.

- To request an interview, the researcher first sent a personalised email to each potential interviewee to establish a line of communication.

- Having made contact, the researcher then called interviewees, who had expressed an interest in participation: this enabled the researcher to develop a rapport with each interviewee, which increased the quality of the interview.

- The researcher then began scheduling each interview with the comfort of the interviewee in mind.

- The participants were assured that no identifying names would be used.

- Interview participants were forwarded a copy of questions beforehand upon request.

- Participants were informed that each interview was being electronically recorded and that all recordings were kept as a transcription tool.

- During transcription, any identifying names of participants were removed.

In the writing of comments, a few remarks were anonymised to protect the identity of participants or organisations. In the findings, participants were referred to using a code; for instance, an expert in activity tourism and recreation was named TRE01 to protect identity. The ethical considerations for Phase 3 of the research were like that of Phase 2. No issues arose that had not already been addressed in the earlier phases of this research.

3.8.3 Phase 4

Similar to the efforts made in Phase 1, to mitigate the risk of ethical concern, the survey design and intervention was conducted with the respondent's privacy and anonymity as a primary concern:

- All data collected were inputted into a computer system, which was password protected and known only to the researcher.

- No names or personal data was required to complete a survey.

- Every respondent was told that this survey was for postgraduate academic research and that all data would be strictly confidential.

- Respondents were informed of the purpose of the study, and that participation was voluntary.

- Respondents were told that they could withdraw from participating in the survey or intervention at any time.

- The researcher alone conducted the surveys, and the researcher was proficient in ethical guidelines.

- Participants were informed of their rights and of the anonymity of the survey responses.

- There were no images taken of participants in the intervention.

As previously mentioned, this final section of the methodology is not without its limitations. The small sample size, as well as the method of delivery, cannot be relied upon to be statistically significant and any statistical testing of the data would at best be indicative. This intervention was designed as a pilot application of the framework to investigate if elements of the proposed framework could be tailored and applied to a specific goal (outdoor recreation). Unfortunately, as is the nature of doctoral research, funding, time and other resources play a major role in what a researcher can do. As evidenced in later chapters, this intervention testing should be seen to demonstrate what the framework could be, not what it is.

3.9   Chapter Summary

The purpose of this chapter was to provide a comprehensive breakdown of the research process conducted to fulfil the objectives of this research. This chapter examined and justified the epistemological assumptions of the pragmatic approach, which served as the basis of this research. By adopting a pragmatic method of inquiry, we are directed to search for practical and useful solutions to difficult

problems or, at the very least, shed some light on a particular issue.

In order to fulfil the objectives of this research, this research focused on sequential MMR, of which triangulation using different types of data was a key component. The quantitative survey was conducted first (Phase 1), and the analysis led to the design of a template for semi-structured expert interviews (Phase 2). To expand upon the already gathered findings and to investigate behavioural change in a range of contexts, a second round of expert interviews was conducted (Phase 3). Phase 3 interviews were used to examine the relationships between theoretical frameworks and practical application in relation to behavioural change. Once all data from Phase 1, 2 and 3 had been analysed, a theoretical framework for behavioural change was developed (Phase 4). The final stage of the methodology was the pilot testing and evaluation of the framework. The ethics and limitations of the four phases of research were discussed as well as protocols put in place to address any issues.

Chapter 4:   Findings: Internal Factors

4.1   Introduction

This research involved the collection of a large amount of data, both qualitative and quantitative. This included 201 onsite user-completed surveys of outdoor recreationists, seven semi-structured interviews with experts in the field of outdoor recreation and tourism, and seven interviews with experts in the field of behavioural change. This chapter will present and discuss some of the main findings of this study.

Due to the large amount of data amassed over four methodological phases, it is necessary to separate the findings into three chapters to add clarity and structure. Chapters 4 and 5 are structured using the initial framework (See Figure 2.6) proposed in the literature review (see Section 2.9). This framework served as the basis for testing using the chosen methodology of this research. Instead of discussing each aspect of the data separately, the following chapters allow for transparent dissemination of all collected data and aid in the simplification of an extremely complicated issue. The findings of this research are divided into three distinct chapters. Chapter 4 examines the internal factors relating to behavioural change, Chapter 5 discusses the external factors and Chapter 6 examines the testing and evaluation of the framework.

The first section of this chapter profiles the participants of the onsite user-completed survey, after which the rest of the chapter examines the findings in relation to the main factors of the proposed framework, starting with internal factors. The grouping of the components was done to reflect on the internal and external influencers of behavioural change. Furthermore, time is incorporated into the framework to

illustrate its effect on the longevity of an intervention. The framework was broken up into three sections: internal, external and time.
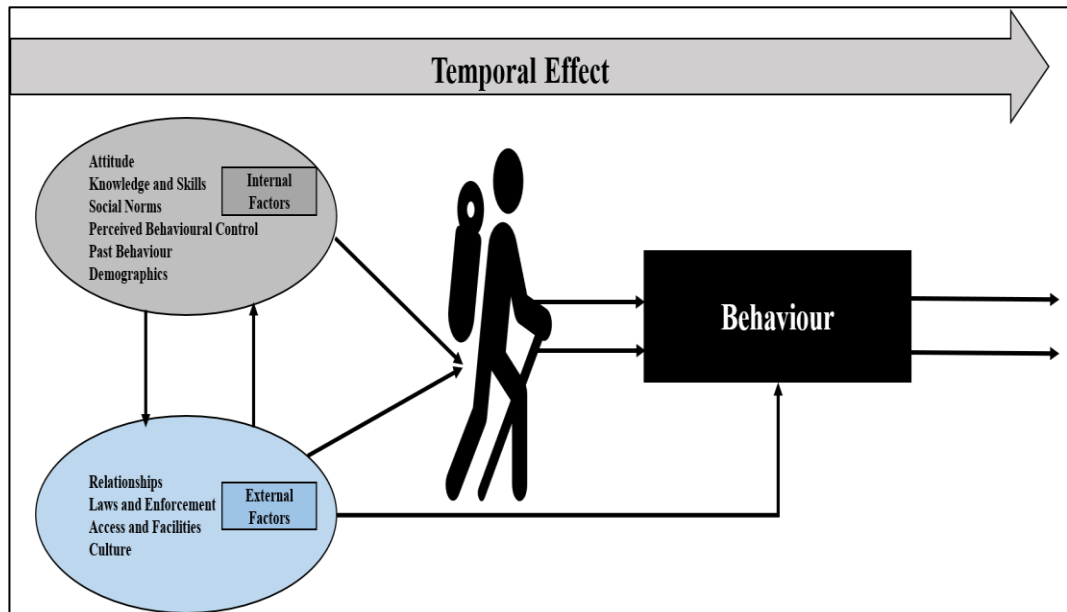
Figure 4.1 Emerging framework illustrating the factors necessary to engender behavioural change in outdoor recreationists

Figure 4.1 illustrates the emerging framework which was developed in the literature review (see Section 2.9.5). The internal components outlined in the framework are examined first. Any proposed additions to the framework are then examined and critiqued on their potential merit.

4.2   Demographic Profile of Phase 1 Survey Respondents

4.2.1 Age/Gender Profile

Figure 4.2 shows the overall age profile of respondents. The minimum age of respondents in the Phase 1 survey was 18. The largest age group of respondents were the 32–38 years age group (26%), with the 39–46 (19%) age group also showing strong representation. The age groups 18–24 (9%), 55–62 (9%) and 63+ (8%) accounted for the lowest level of representation at the survey sites.
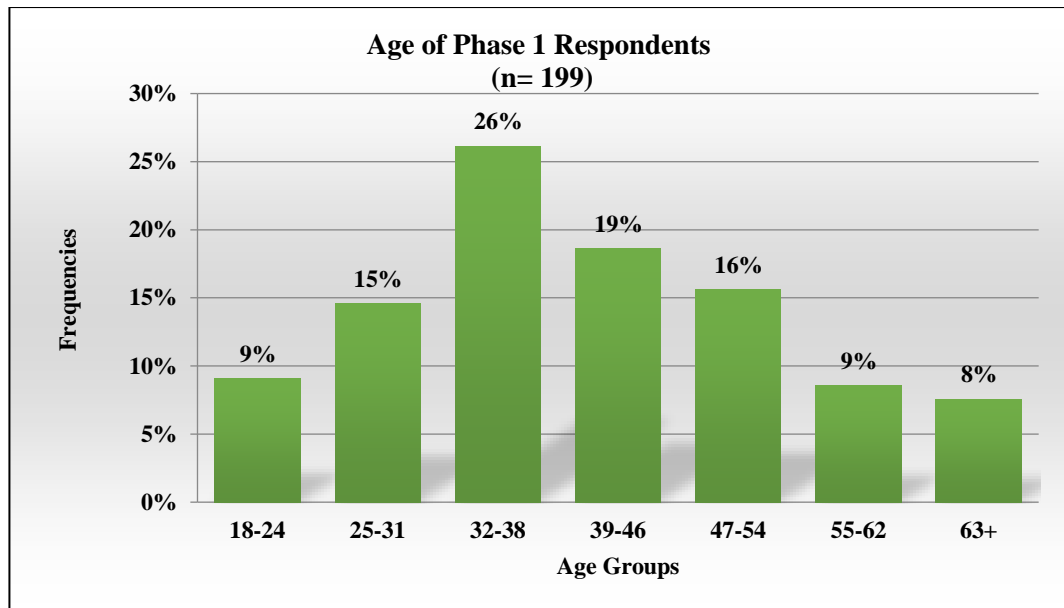
Figure 4.2 Age profile of survey respondents

The largest age group of respondents was the 32-38-year-old category. In order to test similarities of this population with the 2016 census data, a Chi-square goodness of fit test was carried out to examine the observed population of respondents against the expected population as reported by the 2016 Irish Census (Central Statistics Office, 2017a). Due to differences in age categories as well as the inclusion of people under 18 in the census, the age demographic data was transformed to allow for comparison. The transformation involved the removal of ages that are not found in this study, for example, the ages 0-17 were not included in the data collection of this research. Age group categories were then calculated to allow for comparison.

Table 4.1 Chi-square goodness of fit test using Ireland 2016 observed data for age

	Age			Test Statistics		
	Observed N	Expected N	Residual	Chi-Square	DF	Asymp. Sig.
18-31	47	32.8	14.2	34.236	3	< 0.001
32-46	89	63.9	25.1	0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 32.8		
47-54	31	36.1	-5.1			
55+	32	66.1	-34.1			
Total (n)	199					

Using these transformed data, the test (see Table 4.1) indicates that there was a

significant difference in the proportion of ages reported by respondents in the observed sample when compared to the Irish 2016 census data (Central Statistics Office, 2017a) $\chi 2$ (3, n = 199) = 34.236, p < 0.001.

The lower than expected response rate from people aged 55+ could be a result of a number of factors: a possible explanation could be the perceived obstacles such as isolation, fear of molestation, unexpected costs and or the possibility of injury which could influence a person's motivation to engage in outdoor recreation (Daud et al., 2018).

The majority (58%) of participants were female: the ratio of men to women found in this survey is similar to the ratios found in the 2016 census (Central Statistics Office, 2017a). A goodness of fit test was conducted to see if the observed ratios of men to women were statistically different from those observed in the 2016 census for the age groups represented.

The test (see Table 4.2) indicates there was no significant difference in the proportion of male/female respondents in the current sample as compared with the nationwide census of 2016 value of $\chi 2$ (1, n = 199) = 1.84, p < 0.175.

Table 4.2 Chi-Square goodness of fit test using Ireland 2016 observed data for gender

Gender				Test Statistics		
	Observed N	Expected N	Residual	Chi-Square	DF	Asymp. Sig.
Male	82	91.5	-9.5	1.841	1	< 0.175
Female	117	107.5	9.5	0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 91.5.		
Total (n)	199					

4.2.2 Education

Figure 4.3 illustrates the overall educational background of survey participants. A slight majority of respondents had completed some form of third-level education

(52%), and 26% held a non-degree third-level qualification. Furthermore, 16% of respondents reported a secondary-level qualification as the highest level of academic achievement.
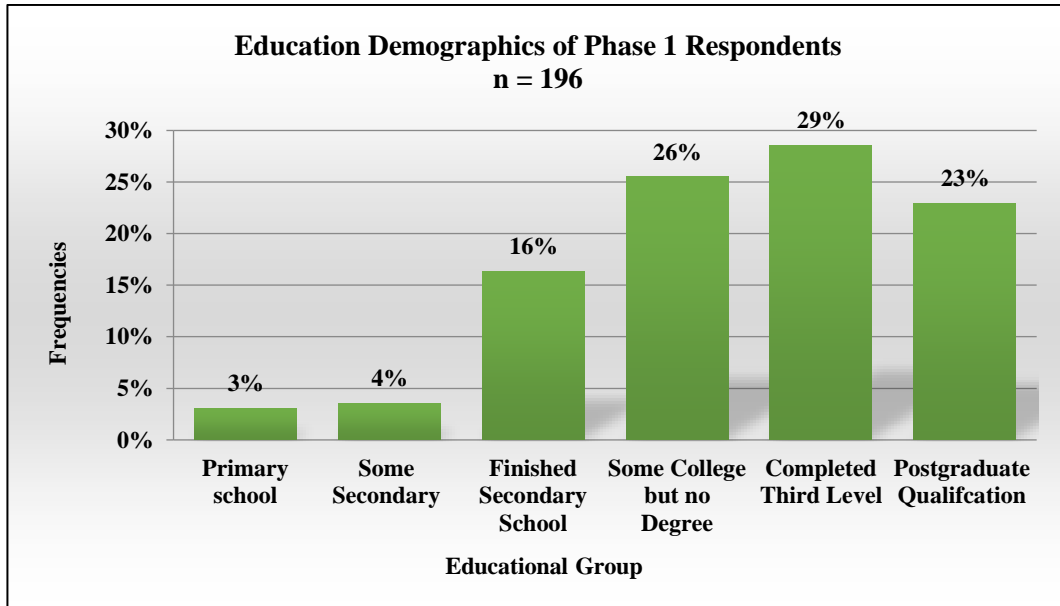
Figure 4.3 Highest levels of education attained of survey participants

The 2016 census reported that in the population of Ireland, approximately 42% had attained some form of third-level education, >35% obtained a secondary level qualification and >13% of people reached primary level (Central Statistics Office, 2017b). The test (see Table 4.3) indicates that there is a significant difference in the level of completed education of respondents in the observed sample as compared with the nationwide census of 2016 value for the respective ages of $\chi2$ (1, n = 196) = 98.796, p < 0.000.

Table 4.3 Chi-square goodness of fit test using Irish 2016 Census observed data for the level of education.

	Education			Test Statistic		
	Observed N	Expected N	Residual	Chi-Square	Df	Asymp. Sig
Primary to Secondary School	45	113.7	-68.7	98.796	1	< 0.001
Third Level Education	151	82.3	68.7	0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 82.3.		
Total	196					

These findings are similar to a report from the United States, produced by The Outdoor Foundation (2017). In that report, participants who engaged with outdoor recreation had a higher level of academic achievement (40% obtained a bachelor's degree or more), when compared to the national census (32.5%) of the United States (Ryan and Bauman, 2016).

In order to test similarities of this population with results produced by The Outdoor Foundation, a Chi-square goodness of fit test was carried out to examine the observed population of respondents against the expected population. The test indicated that there is a significant difference in the level of completed education of respondents in the observed sample as compared with the United States report from the Outdoor Foundation (see Table 4.4); however, the discrepancy is much smaller than the census data with $\chi2$ (1, n = 196) = 16.004, p < 0.001.

Table 4.4 Chi-square goodness of fit test using the United States 2016 reported observed data for recreation participant level of education

Education				Test Statistic		
	Observed N	Expected N	Residual	Chi-Square	Df	Asymp. Sig
Primary to Secondary School	45	72.0	-27.0	16.004	1	< 0.001
Third Level Education	151	124.0	27.0	0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 72.		
Total	196					

The differences in education levels suggest that participants in outdoor recreation tend to possess a higher level of education when compared to the general population; this finding is similar to other studies conducted in Europe in which the users of green spaces tended to have higher levels of education (Fischer et al., 2018).

4.2.3 Origin of Survey Participants

Most respondents (71%) were residents or day-trippers, while 29% were tourists,

including international and domestic tourists. This was an interesting finding as it indicates the high levels of participation conducted by residents. As noted in the literature, much effort is undertaken to quantify the numbers of tourists coming into the country (Fáilte Ireland, 2015b). However, national figures for residential recreational use are not as available. However, Fáilte Ireland does emphasise the value of recreational activities and the high visitation rate observed in the National Parks in Ireland. In addition, a number of studies have examined the development of recreational facilities as a means of attracting more visitors to the area and to increase the quality of life for residents (Irish Sports Council, 2005; Madden, 2009; The Border Midland Western Regional Assembly, 2014). Without accurate usage numbers in recreational areas, the development of sustainable outdoor recreational facilities could be significantly impeded (Cole, 1989; Godbey, 2009; The Border Midland Western Regional Assembly, 2014).

4.2.4 Recreational Activity

Given the plethora of activities that can be construed as outdoor recreation, as well as the range of locations in which outdoor recreation can take place, it is justifiable to state that the respondents to the Phase 1 survey can be regarded as outdoor recreationists. The data collection for Phase 1 occurred in established recreational areas, so users of those areas are, by definition, outdoor recreationists. In addition, approximately 97% of respondents indicated they had performed at least one form of outdoor activity either on the day of survey response or within the last month.

The most popular recreational activity engaged in by respondents to this survey was walking / hiking, with over 56% of respondents to the survey indicating engagement with that recreational activity on the day of the survey.

Table 4.5 Self-reported recreational activities engaged with on day of survey

Activity	N		Sum
	Valid	Invalid/Missing	
Walk/Hike	198	3	112
Fishing	198	3	2
Dog Walking	198	3	25
National Park	198	3	28
Cycling	197	4	5
Swimming	198	3	8
Rock climbing	198	3	0
Spectating	198	3	24
Camping	198	3	4
Sailing	198	3	0
Surfing/ Wind Surfing	197	4	1
Snorkelling	197	4	0
Mountain Biking	198	3	0
Scuba Diving	195	6	0
Canoeing	197	4	0
Picnicking	199	2	28
Kayaking	197	4	0

(The header row above the activity table reads "Statistics" as a spanning title.)

Table 4.5 shows the frequencies of recreational participation over one day. While there was evidence of other recreational activities being performed, and efforts were made to gain respondents from as many recreational groups as possible, some recreational activities were not strongly represented. A number of recreational activities, such as water sports (for example, snorkelling and canoeing) did not have high representation in this survey. While it is true that the vast majority of outdoor recreationists are more likely to engage in soft recreation (Manning and Anderson, 2012; Adventure Travel Trade Association, 2013; Isa and Aziz, 2014), the low engagement with these water sports is surprising. This is especially true since efforts were made to attend seaside and water sports locations during the collection phase. There was more engagement in these activities when participants were asked to list recreational activities conducted in the previous month (see Table 4.6).

Table 4.6 Self-reported recreational activities engaged with within the last Month (excluding the day of survey)

Statistics

Activity	N		Sum
	Valid	Invalid/Missing	
Walk/Hike	198	3	101
Fishing	198	3	8
Dog Walking	198	3	60
National Park	198	3	63
Cycling	197	4	59
Swimming	198	3	63
Rock Climbing	198	3	15
Spectating	197	4	25
Camping	198	3	20
Sailing	197	4	3
Surf/Wind Surf	197	4	7
Snorkelling	196	5	13
Mountain Biking	195	6	3
Canoeing	196	5	6
Picnicking	200	1	6
Kayaking	196	5	20
Running	197	4	8
Kite Surfing	198	3	5
Horse Riding	199	2	5
Golf	196	5	2
Parasailing	198	3	4
Yoga	199	2	2
Walk/Hike	198	3	101

This increased the range of activities as well as the participation numbers in each activity and shows how a single recreationist can engage in multiple recreational activities.

A point could be made that there is a distinction between the activities of walking and hiking regarding the level of physical difficulty and type of experience. However, they were combined for convenience and for comparison to reports such as that by Fáilte Ireland (2018c) in which types of walking were combined. In addition, there was an option to specify any additional recreational activities on the survey, and in no cases were hillwalking, trekking and hiking listed as separate to walking. What is interesting about this section is the range of recreational activities taken part in by each individual, which illustrates that an individual is not limited to a singular form of recreation. For example, a number of respondents listed walking/hiking in addition to a number of other recreational activities like

picnicking, National Park visiting, and swimming etc. Conflict amongst different recreational groups has previously been described in the literature. An example would be the conflict occasionally seen between cyclists and walkers (Skår, Odden and Vistad, 2008). These activities can occur in similar areas, but the activities themselves can be quite different. Overcrowding and usage conflicts between these recreational groups can occur (Knight and Gutzwiller, 1995). However, since a cyclist can be a walker and vice versa, do their attitudes towards other recreational groups change depending on which activity they are performing? This relates to social identity which is discussed in more detail in Section 4.3.6.

4.3   Internal Factors Influencing Behavioural Change

From a review of the literature, a number of internal factors that can influence behavioural intention were identified (see Section 2.9.2). These factors are illustrated in Figure 4.1. These factors provide a structure by which the findings in relation to the influencers of behavioural change can hence be discussed.

4.3.1 Attitude

Attitude, as previously discussed, can be defined as the settled way of thinking or feeling about a particular subject. The use of attitude as a predictor of behavioural intentions is the main focus of academic discourse and research (Tarrant and Green, 1999; Ajzen, 2001; Madden, 2009; Oates and McDonald, 2014). Personal beliefs or attitudes are an integral component of the theory of planned behaviour (Ajzen, 1991).

Attitudinal Score of Respondents

Statements which were relevant to measure environmental attitudes were chosen from the survey. These statements were scored using a seven-point Likert scale. A

total of 10 statements were chosen to measure attitude. The scale had an acceptable level of internal consistency, as determined by a Cronbach's alpha, of 0.795. The results of the reliability analysis can be seen in Table 4.7.

Table 4.7 Case processing and reliability statistics for attitude scale

Case Processing Summary				Reliability Statistics	
		N	%	Cronbach's Alpha	N of Items
Cases	Valid	191	95.0	0.795	10
	Excluded[a]	10	5.0		
	Total	201	100.0		
a. Listwise deletion based on all variables in the procedure.					

The chosen statements can be seen in Table 4.8 below. The scores were combined, and a cumulative score for environmental attitude was obtained.

Table 4.8 Statements chosen to measure attitude in survey respondents

Statement	N
Humans do not have the right to change the environment.**	201
Donating money or giving time to an environmental organisation is a worthy cause.	196
There are not more important things to do in life than protect the environment.**	196
Getting my food from local sources is better for the environment.	196
Many of the claims about environmental threats are not exaggerated.**	196
Environmentally friendly products actually make a difference.	196
Conserving water by turning off the tap while washing dishes has an impact on the environment.*	196
Buying products packaged in containers that can be recycled or reused reduces waste.	196
If I learned that my actions had damaged the environment, I would change my behaviour.	194
The balance of nature is very delicate and easily upset.	201
** indicates field where reverse wording was used, original can be seen in Appendix A. Such statements needed transformation so higher scores indicated pro-environmental attitude.	

To reduce the risk of bias in the respondents and to increase rigour in the analysis, some of the statements were adapted using reverse wording. For the analysis of the data, responses were transformed in order for positive responses to score higher. In Table 4.8, the wording of the all statements has been altered in order for positive responses to score higher, the original statements can be seen in Appendix A. The creation of a cumulative score will allow the analysis of the attitudinal construct in several ways. The scores were converted to a standard scale of 0-100, higher score indicate higher level of agreement towards certain factors. The conversion of scores

has been conducted on other factors such a knowledge, social norms and perceived behavioural control in order to aid comparison.

As the data from this research do not satisfy the assumptions of parametric analysis, a non-parametric analysis was conducted. The median of data frequency for attitude was 84. The interquartile range, which is the difference between the 25th and 75th quartiles was 17.

Table 4.9 Frequency table for attitudinal scoring of participants

Statistics		
N	Valid	191
	Missing	10
Median		84
Skewness		-1.050
Std. Error of Skewness		0.176
Kurtosis		0.862
Std. Error of Kurtosis		0.350
Range		63
Minimum		37
Maximum		100
Percentiles	25	73
	50	84
	75	90

A frequency bar chart pictured below allows for an illustration of the score distribution. As the scale used to measure attitude consisted of 10 seven-point response items, a maximum score would be 70 and a minimum score would be 10. A total of 191 valid survey responses were used to construct a bar chart. The data is negatively skewed (-1.050), which indicates a clustering of scores at the right-hand side of the graph, which is clearly visible in Figure 4.4. In addition, a positive kurtosis indicates that the frequency data is somewhat peaked in the centre.
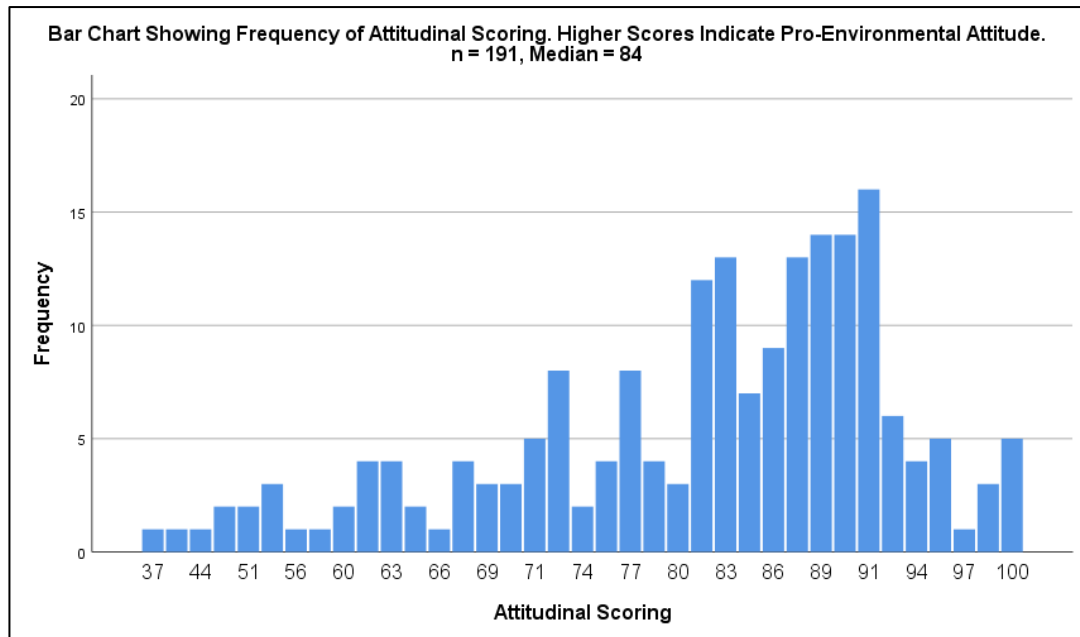
Figure 4.4 Bar chart showing the distribution of attitudinal scoring for Phase 1 survey (n = 191)

The data suggests a relatively high level of pro-environmental attitude in outdoor recreationists, which is not unexpected as a significant selling point of outdoor recreation is to be closer to nature (Schneider and Wynveen, 2015). The research produced by Motherway, et al. (2003) on the environmental attitudes of Irish people provided some interesting comparisons. There exists differences between this research and the study conducted by Motherway, et al. (2003) such as sampling, population and survey questions. However, in a broad sense, some comparisons could be made, especially considering that a number of the statements used in the creation of the survey in Phase 1 were taken from the study conducted by Motherway, et al. (2003). Motherway, et al. noted that environmental concern had become embedded into the day to day lives of their respondents, which could be seen as similar to the pro-environmental attitude exhibited by recreationists (Motherway et al., 2003).

The study conducted by Motherway, et al. (2003), as well as a number of other studies, suggest the presence of a discrepancy between environmental attitude and

behaviour in which an individual possesses high levels of pro-environmental attitude while at the same time performing behaviours that negatively impact the environment (Leung and Marion, 2000; Ellis, 2005; Marion and Reid, 2007; Vagias, 2009). The relatively high levels of pro-environmental found in this research mimic other studies and suggest that there is a gap between a pro-environmental attitude and the participation of environmentally responsible behaviours (Kollmuss and Agyeman, 2002; Oates and McDonald, 2014). This gap serves as a justification for the promotion of low impact educational practices, as research has suggested that supplementing pro-environmental attitude with knowledge and skills can lead to compliance with environmentally responsible behaviour. The idea is that once an individual is aware of their actions, they will be more willing to protect the environment.

Differences in Attitudinal Scoring among Demographics

In order to investigate a difference in attitudinal scoring among demographic groups, a combination of non-parametric tests was used. The first test conducted was the Mann–Whitney U test, which examined the distribution of "attitude" across genders. The null hypothesis stated there would be no difference between genders, and this was rejected at the $p < 0.000$ scale. This means that a statistically significant difference was seen in the attitudinal scoring between males and female respondents to this survey. The box plot in Figure 4.5 provides a visual representation of the differences between the two demographics.
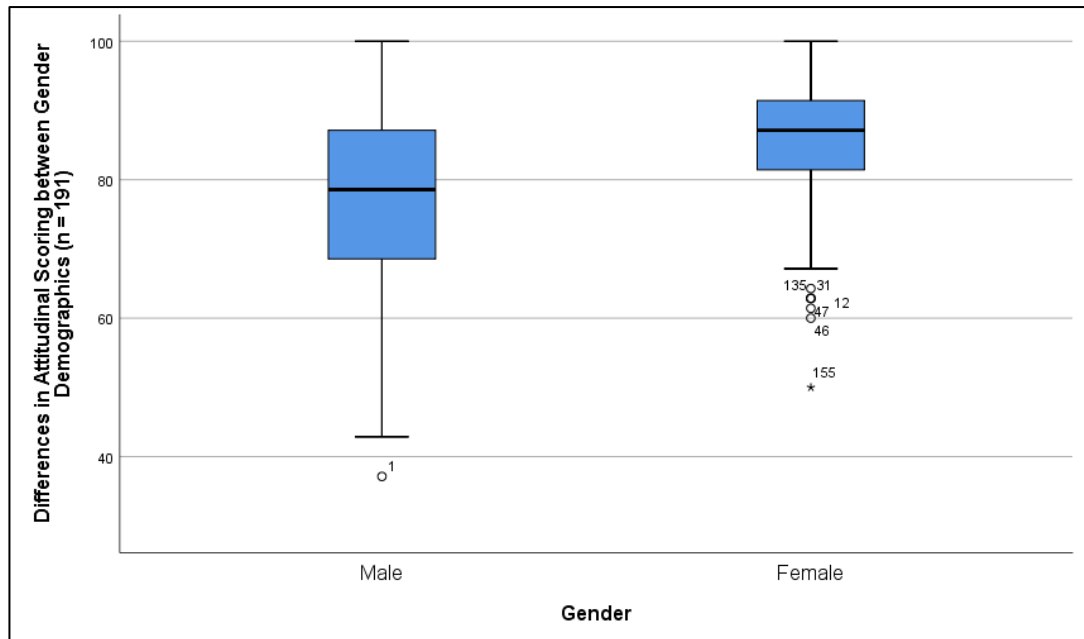
Figure 4.5 Box plot showing frequencies of attitudinal scoring between genders, (n= 191)

Looking at the descriptive statistics in Table 4.10, it would suggest that men hold lower levels of pro-environmental attitude when compared to women, which is supported by some studies which measured environmental concern across demographics (Mostafa, 2007; Lee, Park and Han, 2013).

Table 4.10 Frequency of attitude scoring between gender demographics

Gender		
Male	**Statistic**	**Std. Error**
Median	79	
Minimum	37	
Maximum	100	
Range	63	
Interquartile Range	19	
Skewness	-0.716	0.272
Kurtosis	-0.107	0.538
Female	**Statistic**	**Std. Error**
Median	87	
Minimum	50	
Maximum	100	
Range	50	
Interquartile Range	10	
Skewness	-1.011	0.228
Kurtosis	1.029	0.453

It is interesting to note the broader range seen in the male population in regard to environmental attitude when compared to women, which could suggest uncertainty and lack of concern regarding specific environmental issues.

In order to examine if there was a difference in environmental attitude among age groups, a Kruskal Wallis test was used. The results of the test failed to reject the null hypothesis. This finding is similar to other research with regards to examining environmental attitude between different age groups (Wiernik, Ones and Dilchert, 2013). Indeed, this should be seen as a positive result as it suggests that the environmental concern is not the purview of the young or old. Instead, it is a responsibility shared regardless of age. The frequencies for each age demographic can be seen in Appendix G.

Education has often been a staple for behavioural change, with many researchers advocating that learning more about the environment can increase environmental concern and compliance with low impact recreational practices. A Kruskal Wallis test was used to investigate if the environmental attitude was different between different educational groups. The test rejected the null hypothesis with a significance of $p < 0.01$, which indicates a statistically significant difference between the educational groups. A full breakdown of frequencies and descriptive between educational groups can be seen in the appendices (see Appendix H). The box plot featured below gives a visual representation of the analysis.
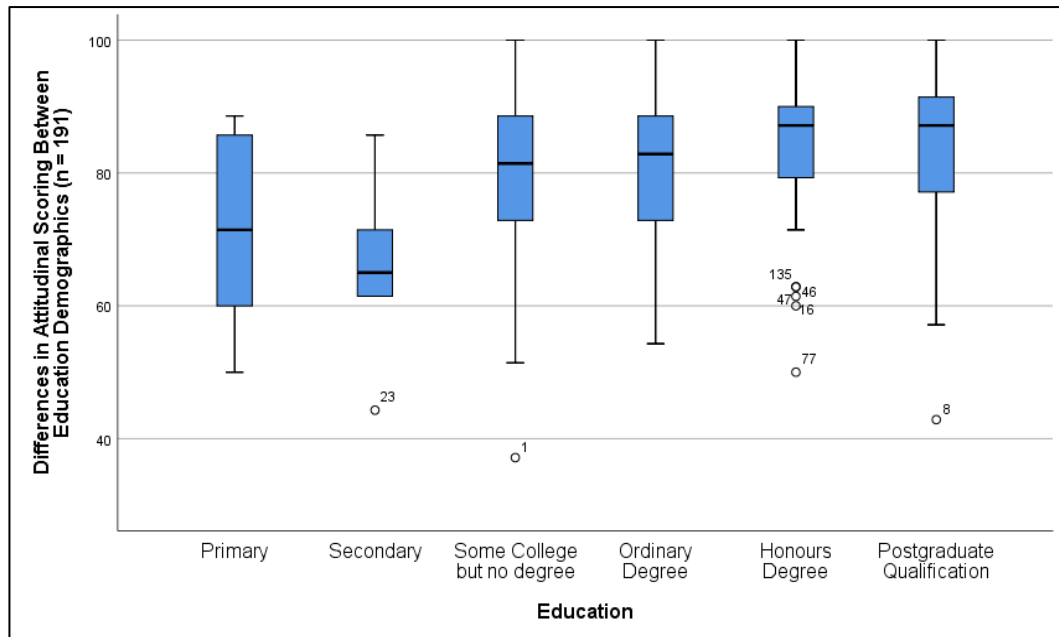
Figure 4.6 Box plot for attitudinal scoring among educational groups

The educational groups with the highest attitudinal median were those who had completed an honours degree and postgraduate education (median = 87), while the lowest-scoring group had only completed some secondary school (median = 65). This suggests that an increase in education could lead to more positive attitudinal change; this is discussed further in Section 4.3.2. These differences found between demographics indicate that environmental attitude is not the same across all sections of society.

This theme was investigated in the expert interviews and produced a range of responses. Some interviewees suggested that certain demographic groups seem to have a reduced environmental attitude. For instance, interviewee 02 (TRE02) believed that although recreationists "Over 35 seemed to have a bit more grounding on environmental issues, it seemed like young people did not give a s##t". In the analysis of the data, participants aged 18–24 had a median score of 81, and this score was the second-lowest group when compared to the 63+ age group. While interviewees 07 and 03 (TRE07, TRE03) believed that it is the older groups of

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recreationists that care little for the environment: "Older people in their 60s to 70s think that throwing away litter is no big deal". This opinion is similar to the study conducted by Motherway, et al. (2003), who found that environmental concern was lowest in the 65+ age group.

For most experts however, demographics were not the most significant concern. Instead, the lack of pro-environmental attitude seems to come from other sources. For example, TRE04 suggested that the lack of pro-environmental attitude is not connected to demographics. Instead, it could be a result of the presentation of environmental messages: "Signs that say don't do something, or don't go here or don't do that, in my opinion, don't work". The theory of planned behaviour suggests that a person's behaviour is based on a rational process, as TRE04 claimed "people are sensible. If you explain something in a coherent and in a positive way, people are, in my opinion, happy to oblige". The effectiveness of the presentation of environmental messages in recreational areas by park management has been discussed in the literature previously (Harding, Borrie and Cole, 2000; Aronson, Milton and Blignaut, 2007; Brown, Ham and Hughes, 2010). The studies suggested that the use of positive reinforcement rather than negative phrasing is more effective at encouraging environmentally responsible behaviour. The efficacy of positive reinforcement is of particular interest from an Irish perspective, as according to TRE02: "I think it is in the Irish DNA, we do not like rules or being told what to do".

These findings prompted the researcher to examine the influence of attitude in behavioural change with the interviews described in the methodology chapter (see Phase 3). The comments from the experts seem to arrive at the consensus that an abrupt approach is no longer the most recommended path. In order to get participants

to adhere to behavioural practices over the long term, a less-intrusive approach that appeals to the emotions of recreationists needs to be utilised.

Attitude has long been the target of advertising campaigns and marketing. The global marketing industry is estimated to be worth $1.7 trillion (Dimitrioski, 2019). Entire companies have been formed to disseminate what a market likes and dislikes and tailor messages to promote brands. BCE12 discusses the use of attitude in the tailoring of environmental messages and in the practice of teaching environmental ethics: ''You have to make them believe that they are the champions, that they can make a difference, but do not scare them". If recreation ecologists need to adapt and tailor behavioural models and frameworks from other disciplines, then it makes sense also to examine how these companies have become so successful. The need to connect at an emotional level is a noteworthy concept. Human emotions, much like our behaviours, are an interesting, if complex, system. The challenge of designing an intervention that will target people on an attitudinal level can be somewhat daunting. At the risk of sounding manipulative, BCE09 argued that using guilt could be an effective method of changing behaviour. The idea being that a recreationist learns that their behaviours have made a significant negative impact, and this guilt could be a motivation to adopt more responsible behaviours. As BCE09 claims: "there is something to making the people feel guilty, as sad as it sounds. There is something to making people feel guilty about what their behaviours are". Does this idea stray into the area of manipulation? At what point does low intensity educational and emotive messaging become paternalistic?

The use of emotion is echoed in the response from BCEs in Ireland. BCE12 argues that "from the very start, it is imperative to have participants emotionally involved".

BCE12 felt that using emotion in their messaging was necessary and they were reluctant to engage in activities that might incite guilt as well as avoiding upsetting or scaring people. There is a difference of opinion between experts from Ireland and the United States towards the utilisation of attitude and emotion. The experts from the United States felt that using guilt can be an effective tool while the experts from Ireland seemed reluctant to utilise such a method. It is interesting to find this difference of opinion as many of the interventions used in Ireland to induce behavioural change have been heavily informed by research conducted in the United States and other countries. Reluctance to use an identified factor, such as guilt, might reduce the effectiveness of an intervention without significant adaptations. Could this difference stem from a cultural attitude towards confrontation and social identity? These concepts are discussed in more detail in Sections 4.3.6 and 5.6.

Attitude towards performing a behaviour has been well highlighted throughout this research as a significant motivator for behaviour; however, time and time again studies have pointed out that attitude on its own is a relatively weak predictor of behaviour (Vermeir and Verbeke, 2006; O'Driscoll, Claudy and Peterson, 2013; Juvan and Dolnicar, 2014; Higham, Reis and Cohen, 2015). So why do we continually put so much research into understanding what people feel? There are many factors that can contribute to the attitude–behaviour gap found in the literature (Blake, 1999; Jensen, 2002; Vermeir and Verbeke, 2006; O'Driscoll, Claudy and Peterson, 2013; Juvan and Dolnicar, 2014). The following sections, and indeed chapters, examine a number of these factors.

Attitudinal Beliefs across Different Topics

Probing attitudinal statements were used as part of the survey to determine

environmental attitudes (See Appendix A). While some of the following examples were not used in the development of an attitudinal scale, the range and variety of responses and their implications were noteworthy. The responses with regards to some statements showed little variation. For instance, when asked if the practise of environmentally responsible behaviour (ERB) could effectively protect the environment, over 92% of respondents agreed. This opinion is not solely an Irish phenomenon. For instance, both front and backcountry respondents in Taff's (2011) study were highly supportive of the practising of ERB, particularly Leave No Trace practices. Discussion of ERB in expert interviews resulted in interesting viewpoints. TRE04 suggested that "a lot of recreational users are not aware of the negative impacts they might cause. Any negative behaviours, on the whole, would be a result of a lack of knowledge or understanding rather than a lack of care". This viewpoint was supported by TRE05 who believed that attitude towards the environment and the participation in ERB "is improving and becoming more topical" in the daily lives of recreationists.

The importance of environmental issues was examined using individual statements in the survey. For instance, Figure 4.7 illustrates the concept of behaving environmentally and its importance to people's lives. Motherway, et al. (2003) considered the prioritisation of environmentalism and found a reduction over time in the belief among respondents that environmentalism and economic growth must be two dichotomous principles. Instead, Motherway, et al. (2003) suggested that these ideals are becoming increasingly interrelated and that the idea of environmental sustainability has taken hold. This is of particular importance with regard to tourism.
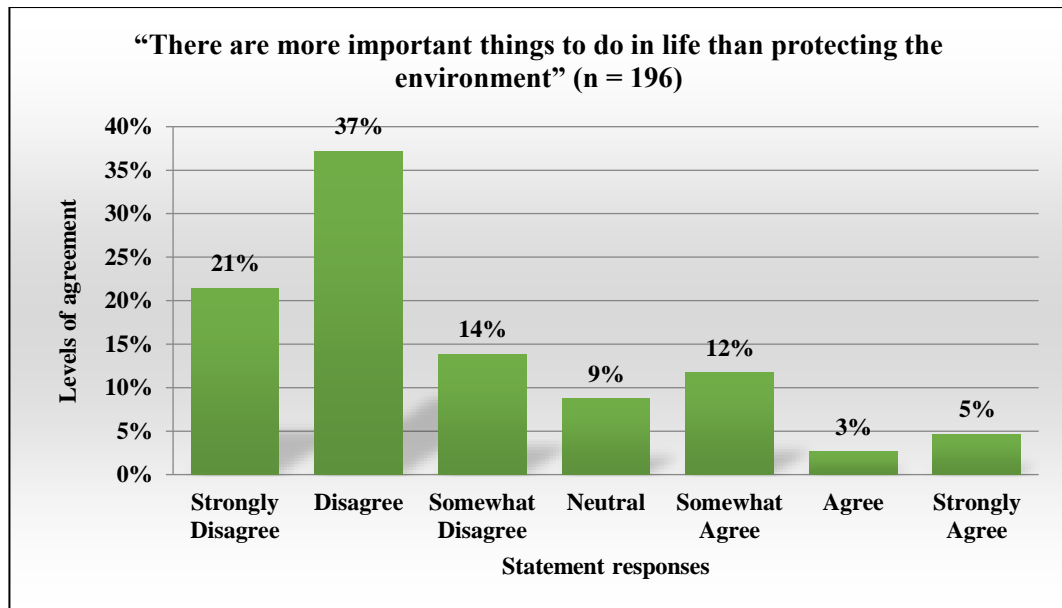
Figure 4.7 "There are more important things to do in life than protecting the environment", showing the percentage scores of respondents (n=196)

As stated in the literature, the growth in tourism can be fraught with negative impacts. "Overtourism" is a new term used with regard to these impacts and their effect on the resident population (Coelho, Gosling and Almeida, 2018; Séraphin, Sheeran and Pilato, 2018; Kuščer and Mihalič, 2019; Séraphin et al., 2019). Two of the more famous examples are the protests held in Barcelona with the "tourists go home" slogan as well as the protests in Venice (Séraphin, Sheeran and Pilato, 2018). The residents in these areas are aware of the economic importance of the tourism industry, but the unstainable development of tourism has dramatically reduced the quality of life for the people. This has led to a number of researchers in the tourism industry prioritising the mitigation of negative impacts in order to increase support for tourism initiatives. The overtourism issue is also an interesting example of the failure of financial incentives to solve complex social issues. In cities like Barcelona and Venice, many businesses benefit directly or indirectly from tourism. Despite this, the anti-tourism sentiment made vocal in recent years, works in conjunction with the findings of this research as it illustrates the importance of attitude, communication

and culture in the development of tourism and outdoor recreation.

A number of statements included in the survey, examined respondents' attitudes towards human's role in the environment. For instance, Figure 4.8 illustrates the attitudes of respondents to the statement "Humans have the right to modify the natural environment to suit their needs", which was met with significant disapproval (80%).
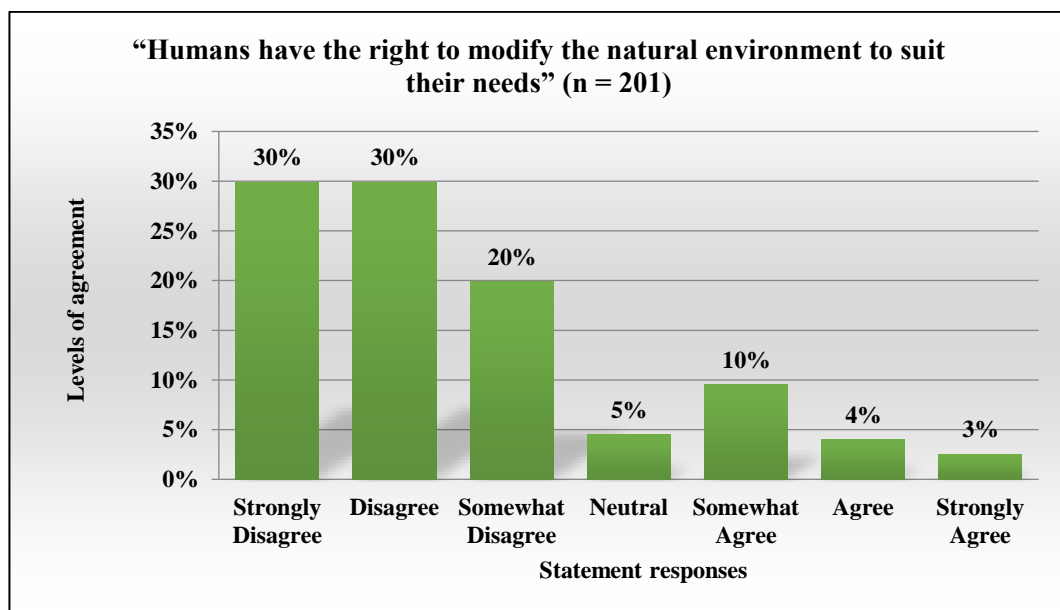
Figure 4.8 "Humans have the right to modify the natural environment to suit their needs", showing the percentage scores of respondents n = 201

By comparing responses to different statements, a pro-environmental attitude of outdoor recreationists was examined in further detail. For instance, the statement "buying environmentally friendly products reduced waste" (see Figure 4.9) resulted in a high level of agreement.
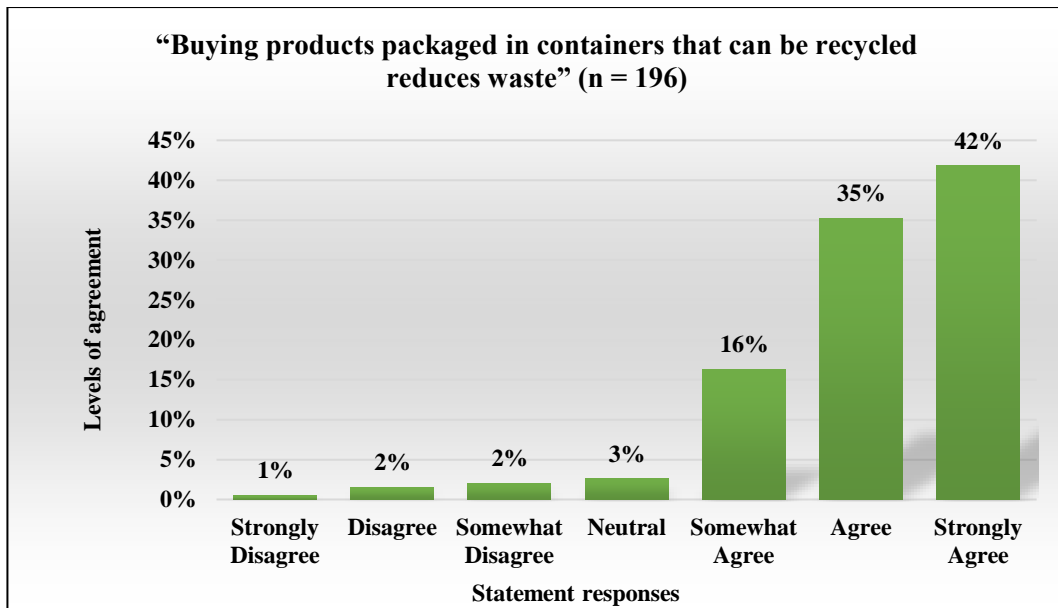
Figure 4.9 "Buying products packaged in containers that can be recycled reduces waste", showing the percentage scores of respondents (N=196)

The results suggest that recreationists are in tune with environmental issues on a broad scale. These themes are supported by expert interviews; for example, TRE04 felt that those visiting outdoor recreational areas have a "consciousness to connect with outdoors and have a consciousness of the natural environment". This is also found in the literature, as many studies have attested that the desire to be close to nature is a primary motivation for visiting the outdoors (Walker, Deng and Dieser, 2001; Xu and Fox, 2014; Lee and Jan, 2015). TRE03 reaffirmed this belief and suggested that, in a broad sense, pro-environmental attitude is high in outdoor recreationists. In particular, TRE03 felt that recreationists "would be very conscious of plastics and plastic bottles". BCE11 expounded upon this topic with a description of how Irish people have, in recent years, become more aware of environmental issues such as the impact of plastic. BCE11 argued that Ireland had shown significant initial progress towards environmentally responsible behaviour, as evidenced by the introduction of the plastic bag levy. However, BCE11 posited that Ireland has failed to keep up the momentum with this commitment, particularly in the area of single-

use plastics. In further discussion of this theme, BCE11 was asked if a similar approach to the plastic bag levy would be effective in targeting the use of single-use plastic bottles. BCE11 expressed support for such an intervention, which was surprising considering the implications. The introduction of such a levy is considerably different from the low intrusive approach that most research supports in the field of outdoor recreation management.

BCE10 targeted the issue of waste plastic in a different way. BCE10 is heavily involved in the organisation and development of a number of beach cleaning events throughout Ireland. They described how they use the negative attitude associated with plastic and other litter on beaches as a means to motivate people to act. This targeting of emotions allows BCE10 to run events that remove tons of litter from beaches throughout Ireland. In addition, the now clean beaches promote the message and help the organisational movement grow. The different perspective seen between BCE11 and BCE10 is quite interesting. While both can have a significant impact depending on circumstances, the evidence suggests that BCE10's approach could be more sustainable. BCE10 described an additional effect of their efforts, where local council officials, who did not have the necessary funds to organise a beach clean-up, have cooperated with BCE10 in order to organise maintenance on recently cleaned beaches. This combination of using attitude to inspire action in local communities, which in turn promotes environmental maintenance in local authorities is an exciting avenue of thought, worthy of consideration for inclusion in a framework.

Research in the past has shown that alignment of action between regulatory authorities and local communities can significantly increase compliance with interventions (Cole, 1989; Knight and Gutzwiller, 1995; Ellis, 2005; Sorice, Flamm

and McDonald, 2007). When considering an intervention, emphasis must be placed in understanding the underlying attitudinal beliefs of the target audience in order to gauge the most effective intervention design. An example discussed in the literature review is the introduction of the smoking ban in Ireland. While it was a nationwide intervention, there was a significant amount of effort conducted in relation to the attitude of the population. Campaigns were run to sway the public opinion in favour of the smoking ban in terms of health as well as the rights of the non-smokers. This increased compliance and aided in the success of the intervention, which otherwise might have received severe pushback (see Section 2.8.1).

A pro-environmental attitude seems to be prevalent in the results of this research, as seen in the support for recyclable packaging in Figure 4.9, yet negative impacts are a persistent and severe issue. A possible explanation for this was mentioned by TRE03: "the idea of sustainability and negative impacts confuses people because everyone has a different idea of what sustainability and negative impacts are". This attitude–behaviour gap is explained by Oates and McDonald (2014, p.169), who stated "that although people condone environmentally friendly actions, their green attitudes do not necessarily translate into green behaviours". The attitude–behaviour gap is debated across numerous studies (Kollmuss and Agyeman, 2002; Oates and McDonald, 2014; Higham, Reis and Cohen, 2015), which reinforces the opinion that although people in Ireland seem to be highly supportive of environmental initiatives in theory, their behaviours are not solely based on their attitude towards the practising of ERB. The role of attitude and how it influences behaviour as well as the interactions with other aspects of the theoretical framework is discussed in later sections of this chapter.

How to Incorporate Attitude in a Framework

Looking at the data presented and reviewing the literature suggests a misconception between the usefulness of attitude in behavioural change interventions and attitude's strength to induce behavioural change. The attitude–behaviour gap described earlier identified the issue with the over-reliance of attitude in the design of behavioural interventions. However, in discussions with behavioural change experts, the exclusion of attitude as a factor in intervention design is also not without issue. It is not by chance that attitude has remained one of the key components of the theory of planned behaviour. BCE09 discussed an intervention involving the introduction of signage into the area to investigate if the signage had any impact on behaviour. BCE09 highlighted the challenge associated with the treatment due to the fact that they "are not changing attitude". Instead, the treatment focused "more simply about changing a behaviour".

This objective of attempting a behavioural change without incorporating attitude was critiqued by BCE11, who suggested that without consideration of the personal beliefs and attitudes of participants, behavioural change can be difficult to accomplish. Social identity and beliefs are discussed in more detail in Section 4.3.6; however, it should be noted that social identity can have a significant role in the attitudinal beliefs of participants. Instead of trying to change attitude, it would be more pragmatic to strengthen the seemingly pro-environmental beliefs in order to increase compliance with environmentally responsible behaviours. There was a high level of support for the practising of environmentally responsible behaviours observed in the analysis of the survey conducted in Phase 1. In addition, an examination of the literature and discussions with experts in both Phase 2 and Phase 3 have, for the most part, concurred with this finding. This suggests that the performance of irresponsible

behaviours by recreationists is more likely due to uninformed, unaware or careless actions rather than malicious intent. This result is also evident in the literature, which is encouraging as the efficacy of educational strategies has been shown to be more successful when targeting uniformed, unaware and careless recreationists (Strauss, 1987; Ellis, 2005; Marion and Reid, 2007).

Attitude's importance in behavioural change theory is well established. However, evidence suggests that it has not been utilised to its full potential in the past. Instead of isolating and examining attitude on its own, the focus should be on examining the effect that attitude has on a number of factors that influence behaviour. The inclusion of attitude at the early stage of this chapter will allow for these relationships to be examined in later sections. The next section discusses knowledge and skills and their incorporation into the framework as well as the difference between knowledge and attitude in the context of behavioural change and their use in the design of behavioural interventions.

4.3.2 Knowledge

Knowledge is described as facts, information and skills acquired through experience or education: the theoretical or practical understanding of a subject. A person's life experiences and knowledge aid in the development of attitudes, and these attitudes are susceptible to change. Prior knowledge, for instance, has been suggested to be a significant factor in determining attitude (Smith et al., 2008; Manning and Anderson, 2012). In relation to the objectives of this research, this section will first discuss the knowledge of stakeholders regarding the practising of environmentally responsible behaviours. This will be built upon with the addition of the findings of discussions with experts in behavioural change on the use of knowledge in the design of

behavioural interventions. The relationship between knowledge and attitude is discussed as well as a justification for the inclusion of knowledge into the proposed framework.

Knowledge Score of Participants

The environmental knowledge of the sample of outdoor recreationists was examined employing a similar approach to that used in the previous section on attitude (see Section 4.3.1). These statements were scored using a seven-point Likert scale. A total of 12 statements were chosen to measure knowledge. The scale had an acceptable level of internal consistency of 0.735. The results of case processing and the reliability analysis can be seen in Table 4.11.

Table 4.11 Case processing and reliability statistics for knowledge scale

Case Processing Summary				Reliability Statistics	
		N	%	Cronbach's Alpha	No of Items
Cases	Valid	195	97.0	0.735	12
	Excluded[a]	6	3.0		
	Total	201	100.0		
a. Listwise deletion based on all variables in the procedure.					

Some of the chosen statements required prior transformation in order for positive responses to score higher, this was necessary as negative or reverse wording was used to reduce bias. The statements used for the scale of respondent knowledge can be seen in Table 4.12.

Table 4.12 Statements chosen to measure knowledge in survey respondents

Statement	N
When a trail is muddy, walking beside a trail is OK.**	200
Leaving food scraps is OK because animals need to eat.**	201
Arrive unprepared to experience the real wilderness.**	201
Scheduling my trip during quiet times to reduce the impact on the environment.	200
Travel off-trail to experience the natural environment.**	200
Go to the toilet in a lake, river or stream if there are no public facilities.**	201
Move rocks and/or logs to make a resting location more comfortable.**	200
Drop food on the ground to provide wildlife with a food source.**	201
Approach wildlife to take a photo.**	198
Not approaching, feeding or the following wildlife.	195
Clean up somebody else's rubbish.	199

Stay on designated or established trails.	198

** indicates field where reverse wording was used, original can be seen in Appendix A. Such statements needed transformation so higher scores greater environmental knowledge.

An examination of the frequency bar chart illustrates the distribution of scores for knowledge (see Figure 4.10).
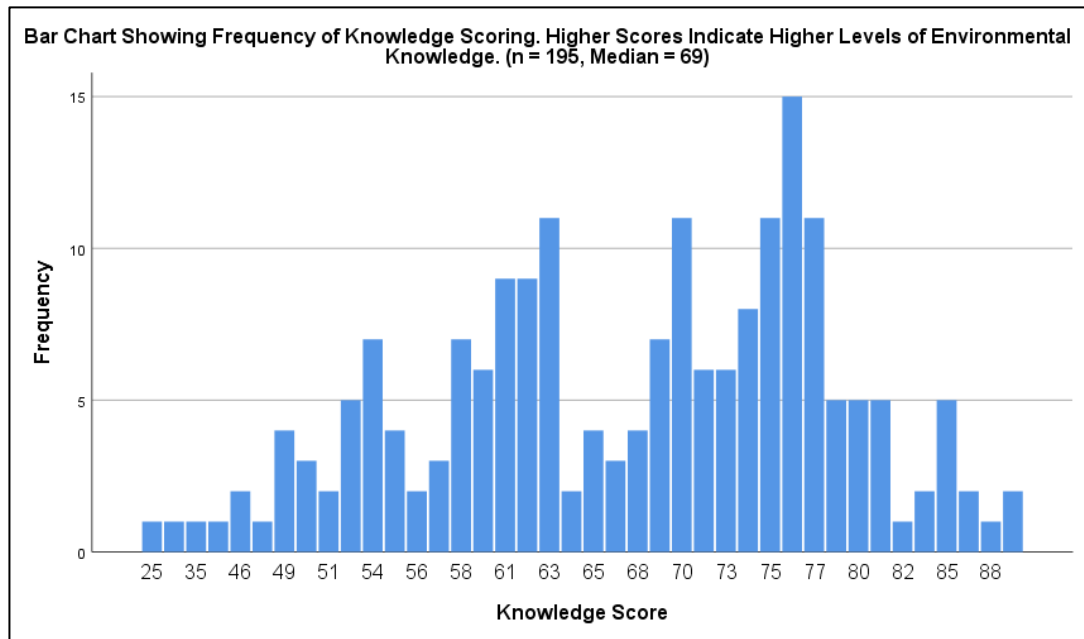
Figure 4.10 Bar chart showing the distribution of knowledge scores (n = 195)

The observed median score for knowledge was 69, with an interquartile range of 16, as seen in Table 4.13.

Table 4.13 Frequency table for knowledge

Statistics		
N	Valid	195
	Missing	6
Median		69
Skewness		-0.623
Std. Error of Skewness		0.174
Kurtosis		0.492
Std. Error of Kurtosis		0.346
Range		54
Minimum		25
Maximum		89
Percentiles	25	60
	50	69
	75	76

The scoring of knowledge is lower when compared to attitude. In addition, there is less skewness and kurtosis, which could suggest that the level of environmental

knowledge is lower than the level of environmental attitude. This difference between levels of environmental knowledge and attitude has occurred in numerous studies (Knight and Gutzwiller, 1995; Kollmuss and Agyeman, 2002; Roovers, Hermy and Gulinck, 2002; Smith et al., 2008). This result suggests that although there is a high level of pro-environmental attitude, respondents to this survey were less familiar with the natural processes occurring around them.

Investigation of this theme continued with Phase 2 expert interviews. Tourism and recreation experts were asked to discuss the current levels of environmental knowledge among outdoor recreationists in Ireland and score the level of knowledge on a scale of 1–10 (1 = low knowledge, 10 = high knowledge).

While most interviewees gave a positive score of 6 or above out of 10, TRE02 believed the number to be much lower (2/10). TRE02 explained this by stating "They think they know a lot, but when you scratch under the surface, they know very little". Despite the scoring, other respondents expressed support for this view in how they describe the knowledge of recreationists. In particular, TRE06 indicated the disassociation in people's knowledge by suggesting that outdoor recreationists "associated environmental impacts as litter" and did not consider other forms of negative impacts on the environment as a result of their behaviours. Furthermore, TRE06 believed that "they do not understand their role in reducing environmental impact when they are out there".

A noteworthy point is that this idea of confusion over a person's role in the environment was also seen in the interviews during Phase 3. In the discussion of the biggest challenges relating to behavioural change, several experts indicated that there

sometimes exists a belief among recreationists that rules do not apply to them. BCE14, who is heavily involved with behavioural change and dog control in Ireland, argued that some dog owners believe that they do not have to comply with regulations because "their dogs are really well behaved". The lack of coherence regarding a person's role and responsibilities in the environment has been a motivation for the use of education to achieve behavioural change in the past (Reid and Marion, 2003; Marion and Reid, 2007; Vagias, 2009; Schlegel and Rupf, 2010).

The use of education is not a new concept in the discipline of behavioural change. In the area of recreation management, education has been a highly encouraging means to increase adherence to regulations (Reid and Marion, 2003; Marion and Reid, 2007; Vagias, 2009). A core facet of the need for education in behavioural change is that education provides better evidence for long-term behavioural change. BCE10 argued that sustainable change is impossible without informing the public as to why a change is necessary. BCE10 continued this thread by explaining the need to inform the public on the "why" when designing behavioural interventions. The dissemination of information could increase compliance with environmentally responsible behaviours when compared to interventions that just raise awareness, which would aid in addressing the attitude–behaviour gap (Daniels and Marion, 2005; Sorice, Flamm and McDonald, 2007; Lawhon et al., 2013).

BCE10 reaffirmed that failure to include education in the design of behavioural interventions will lead to more problems in the future, not only in the current intervention but in interventions that may follow. A number of experts in both Phase 2 and Phase 3 of the research indicated that although there is a broad acceptance of the harmful effects of some activities, for instance, litter and dog fouling, other

negative impacts that require a more advanced level of knowledge seem to be unknown or less known. Some examples given during the expert interviews of a lack of awareness regarding the negative impacts include trail erosion, the introduction of invasive species, habitat destruction and overcrowding. These negative impacts are of high importance and ones which each of the interviewees deals with on a regular basis. As TRE01 explained: "The mountains are not as beautiful as they should be". This raises fears for the development of outdoor recreation in Ireland, as TRE01 indicated, with the projected increase in activity tourism "the degree of recreation activity is clearly not sustainable".

The fear of unsustainable tourism development in mountainous areas was echoed by BCE13, who had encountered this problem in the past. BCE13 is involved with tourism and recreational behavioural change in New Zealand. BCE13 encountered unsustainable mountain usage along with a significant cultural clash with the Māori people, who are the indigenous Polynesian people who settled in New Zealand in the 13th Century. BCE13 described the difficulty in promoting a sustainable tourism and recreation ethos to visitors, while at the same time reducing conflict with a culture that has a spiritualistic connection to the land and in particular the sacred peaks and lakes (Bernbaum, 2006). The need to understand and adapt educational messaging to suit the culture of an area was expressed by BCE13, who altered their approach and did not use methods that had been used in other areas. This allowed for a bespoke, tailored educational message to be developed with the local indigenous people which informed visitors that they were both entering a wilderness area and a profoundly significant cultural location.

This lack of environmental knowledge mentioned by experts in both Phase 2 and 3

could be due to many ecological problems being perceived as non-tangible to many recreationist perspectives and the degradation of natural areas occurring gradually (Kollmuss and Agyeman, 2002). It is possible that the disparity between the respondents to the Phase 1 survey and the opinions of the experts occurs as a result of these factors. As we cannot perceive in real-time many of the effects of our behaviours, it means that we cannot learn from our experiences. Kollmuss and Agyeman (2002) expand on this concept further by comparing humans with an experiment conducted on frogs, "when placed into hot water, they immediately jumped out, but when put into cool water that was slowly heated, they did not react and boiled to death" (Kollmuss and Agyeman, 2002, p.253). This analogy serves to describe the mentality that unless an environmental impact is clearly understood, then little concern is shown to it. This idea was suggested by TRE06, who indicated a major issue with recreationists being the "lack of self-awareness to what their behaviours actually are". Building on this point, several participants in Phase 3 spoke about the difficulties in getting people to realise the negative impacts that irresponsible recreation is causing. BCE08 described how a major problem in the United States is that that many visitors to the national parks are visiting the area for the first time. As such, their perception of what a clean and un-impacted area should look like can be vastly different compared to a regular user. BCE08 lamented that, having visited the same area multiple times, visitors have seen the cumulative effect of recreation that may go unnoticed by a casual user. The effect of time is discussed in Section 4.3.5; however, it is important to recognise the challenge of imparting knowledge that may be construed as intangible to a casual observer.

Differences in Environmental Knowledge Among Demographics

Kollmuss and Agyeman (2002) suggested that some demographics can have an

impact on the level of environmental knowledge. These demographics include gender and the number of years in education. For instance, some studies suggest that women are more likely to adopt positive environmental attitudes because they tend to put the welfare of other people and the health of ecological systems ahead of their personal benefits (Lee, Park and Han, 2013). As previously seen in a number of studies, women scored significantly higher than men regarding pro-environmental attitude (Mostafa, 2007; Lee, Park and Han, 2013), which is consistent with this study. However, previous studies have found that women are seen to have less extensive knowledge of ecological processes compared to men (Kollmuss and Agyeman, 2002). Table 4.14 illustrates the differences between genders in relation to knowledge scoring.

Table 4.14 Frequency of knowledge scoring by gender

Gender		
Male	**Statistic**	**Std. Error**
Median	66	
Minimum	25	
Maximum	83	
Range	58	
Interquartile Range	16	
Skewness	-0.856	0.267
Kurtosis	1.127	0.529
Female	**Statistic**	**Std. Error**
Median	71	
Minimum	35	
Maximum	89	
Range	54	
Interquartile Range	16	
Skewness	- 0.478	0.227
Kurtosis	-0.213	0.451

In this study, however, women score marginally higher than men regarding environmental knowledge, although the difference was smaller than that seen in attitude (see Section 4.3.1). The median score for men was 66, while the median score for women was 71. Similarly to attitude, a Mann–Whitney U test examined the distribution of knowledge across genders. The test confirmed a statistically

significant difference in the environmental knowledge between the two gender groups of outdoor recreationists (n = 194, standardised test statistic = 2.838, significance p < 0.005).

Kollmuss and Agyeman (2002) also suggested that the years of education that outdoor recreationists received is a factor in the scoring of environmental knowledge. The presumption is that the longer the participant engages in education, the more extensive the knowledge of environmental issues is evident. As previously discussed (see Section 4.2.2), the proportion of participants in the survey who had received at least some form of third-level education was significantly higher than that observed in the general Irish population (Central Statistics Office, 2012). A Kruskal–Wallis test was used to investigate if the scoring of knowledge was different between different educational groups. The test rejected the null hypothesis, which indicates a statistically significant difference between the educational groups (n = 191, test statistic = 16.450, Df = 5, asymptotic significance p < 0.006). The highest educational scoring group were those who had completed postgraduate education (median = 71), while the lowest-scoring group had only completed some secondary school (median = 61). This finding supports the idea that more time spent in education is a factor in the scoring of environmental knowledge. However, participants who indicated that primary school was the highest level of education had a median score of 69, which scored higher than people with an ordinary degree. The high scoring seen in the primary school demographic of respondents could be a result of low respondent numbers for that group. The full break down of frequencies of knowledge scoring between education demographics can be seen in the appendices (see Appendix I).

Looking at other possible demographics, a Kruskal–Wallis test failed to reject the null hypothesis for age. This is similar to the result found by Wiernik, Ones and Dilchert (2013), who found that age has negligible relationships regarding environmental knowledge. In addition, the strength and deficiencies regarding environmental concern can be similar throughout age groups.

Variation in Knowledge Across Different Topics

An analysis of the data suggests that there is a variation with regards to knowledge of environmental processes among topics. For instance, in Figure 4.11, dog fouling was seen as harmful by the majority of recreationists.
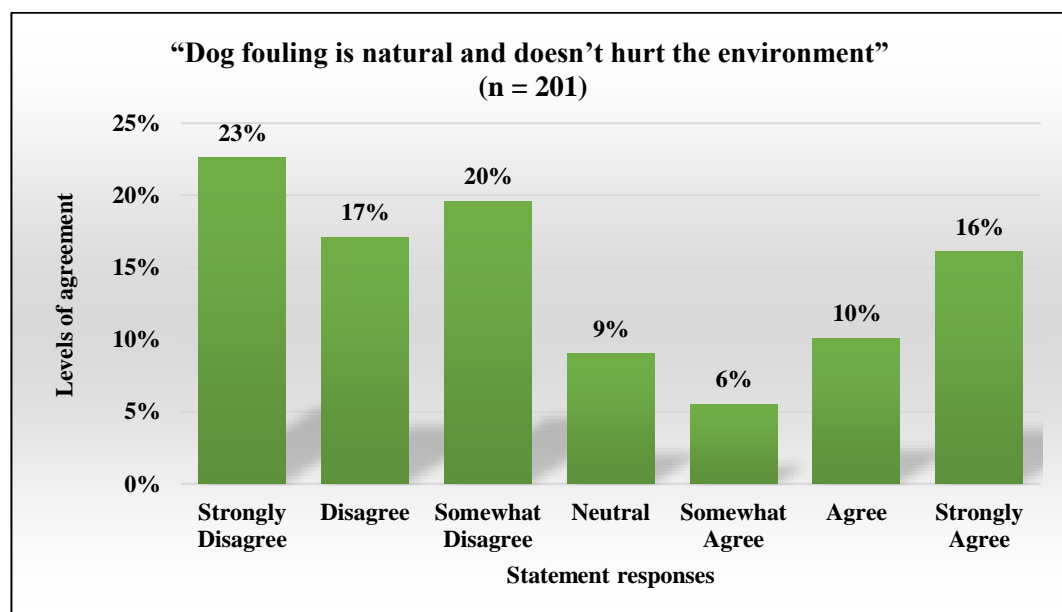
Figure 4.11 "Dog fouling is natural and doesn't hurt the environment", showing the percentage scores of respondents (n = 201)

However, 32% of respondents did not think that dog fouling was harmful. This suggested that despite the efforts made in the past to educate on the harmful effects of dog fouling, a significant number of recreationists are unaware of the potential impact (Scottish Wildlife Trust, 2007; Comley and Mackintosh, 2014). As mentioned previously, BCE14 was heavily focused on behavioural change with

regard to recreational dog walking. BCE14 expressed the difficulty in changing a person's perception of their dog's role in the outdoors and the negative impact that a non-controlled dog can have. BCE14 explained that as part of their role, they are attempting to design and develop dog owner education; however, there is a need to phrase the issue in the educational message "in a way to make it attractive to people". The perception that a person (or rather their pet) is not having an impact on the environment and the unwillingness of recreationists to perceive a fault in their actions is a serious issue.

The issue with dog control was further developed by BCE14. They discussed how dog control goes beyond environmental concern as there are a number of laws in place that legislate for the control of dogs. BCE14 argued that, in a lot of cases, people with dogs on the dangerous dog list "do not believe that their dog would ever do something like that" and as such do not need to abide by regulation. BCE14 contended that the issue is trying to get across the message that it does not matter what you "believe": if a person has a dog on the dangerous dog list, it must be kept under control by law. This noncompliance and ignorance of regulation are one of the main factors for the support of education in outdoor recreational management. The efforts of BCE14 demonstrate that a simplistic authoritative intervention such as a prohibitive sign in recreational areas is of little value when engaging with groups of people who feel that the laws do not apply to them. Instead, a more informative approach as to why the regulations are necessary may be more effective in encouraging compliance when compared to enforcement.

Other statements, however, that would require a deeper understanding of ecosystem processes were answered incorrectly. For example, "collecting leaves and flowers is

ok in moderation" (see Figure 4.12) was met with agreement from the majority of respondents and showed little variation in answering.

"Collecting leaves and flowers is OK in moderation" (n = 201)
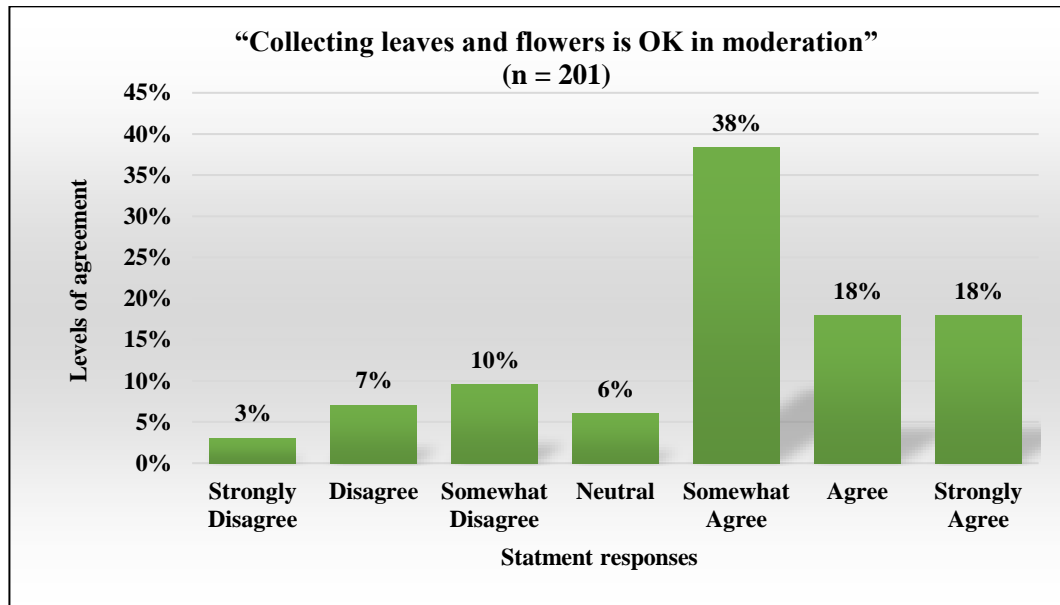
Figure 4.12 "Collecting leaves and flowers is OK in moderation", showing the percentage scores of respondents (N=201)

The data suggests that not only are participants unaware of the negative impacts associated with some of their actions but that some behaviours which are harmful to the environment are carried out with the belief that they cause no negative impacts.

The taking of souvenirs from outdoor recreational areas and the lack of knowledge to know that that behaviour was irresponsible is evident in previous studies (Trafimow and Borrie, 1999). For example, in the United States, the theft or taking of souvenirs from the Petrified Forest National Park in Arizona has caused numerous issues for park management (Trafimow and Borrie, 1999). In this study, recreationists who had taken samples of fossilised wood as souvenirs did not associate their behaviours as having any negative impact on the area or that it was inappropriate to do so. When informed of the adverse impacts associated with the taking of fossilised wood, many of the perpetrators attempted to return the fossilised

wood to the management. This study serves as an example of how there is a disassociation between what we think our behaviours are and the impacts that they can have on the natural environment.

There are a number of studies that advocate the use of positive enforcement instead of authoritative messaging intervention design (Kollmuss and Agyeman, 2002; Manning, 2007; Alahäivälä and Oinas-Kukkonen, 2016). Using the "carrot" before the "stick" allows for communication between the participant and land management as to why a policy is in place. It may allow a participant to recognise their role in the environment in which they are taking part in recreation. A core factor in the need for education in behavioural change is that education provides better evidence for long-term behavioural change. BCE10 argued that sustainable change is impossible without informing the public as to why a change is necessary. BCE10 continued this thread by explaining the need to inform the public on the "why" in relation to behavioural interventions. This idea is in agreement with a body of literature which argued that uninformed behaviours cause a significant amount of adverse impacts associated with outdoor recreation (Ribe, 2002; Newman et al., 2003; Daniels and Marion, 2005; Sorice, Flamm and McDonald, 2007). BCE10 reaffirmed that failure to include education in the design of behavioural interventions will lead to more problems in the future, not only in the current intervention but in interventions that may follow.

In addition, a statement "When a trail is muddy walking beside the trail is OK" (see Figure 4.13), resulted in a significant amount of variation in the responses from participants.
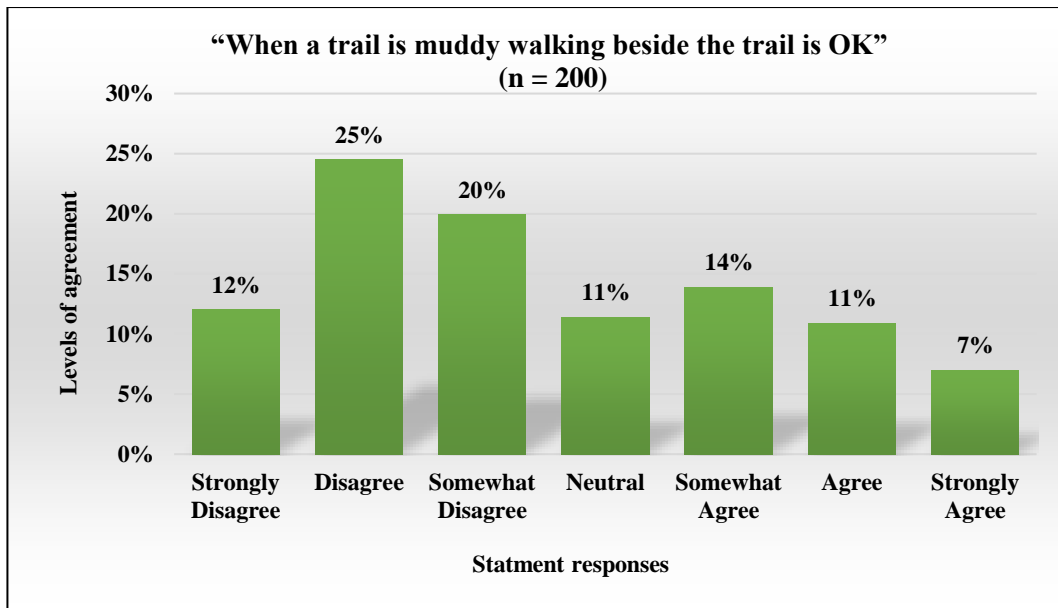
Figure 4.13 "When a trail is muddy walking beside the trail is OK", showing the percentage scores of respondents (n = 200)

This point is echoed in the expert interviews, for example, TRE03 stated "A lot of people go where their feet feel comfortable, walking not necessarily on the path, they do not realise that they are causing erosion". Knowledge of trail degradation is of particular importance for the sustainable development of tourism in Ireland (Irish Sports Council, 2005; Comhairle Na Tuaithe, 2006; Madden, 2009).

The continued use of unofficial "user-created trails", combined with the increase in people who are using these trails for recreation, has caused a significant amount of erosion in recent years. So much so, that sustainable development and research of trails and trail erosion is a topic of much concern (Mountain Meitheal, 2003; Irish Sports Council, 2005; Comhairle Na Tuaithe, 2006; Harty, 2018). The slope to Croagh Patrick, which sees large numbers of pilgrims each year, and other upland areas such as Devil's Ladder at Carrantuohill are significant examples of the erosion of vegetation and topsoil due to recreational footfall (Madden, 2009).

The variation seen in attitudes and knowledge between different topics could be an

indication that respondents have a pro-environmental attitude but a lack of understanding of the range of impacts that can be caused by outdoor recreation. Evidence of this lack of understanding is supported by the literature, as previously stated (see Section 2.5). Careless, unskilled recreationists may also be the most amenable to information and educational initiatives (Leung and Marion, 2000; Newman et al., 2003; Widman, 2010).

Knowledge as a Predictor of Behaviour

The use of knowledge as a predictor of behaviour is not a new concept in the fields of recreation ecology and environmental psychology (Kollmuss and Agyeman, 2002; Marion and Reid, 2007; Brown, Ham and Hughes, 2010). Many scholars note that although there is a correlation between knowledge and behaviour, the influence of knowledge on behavioural intention is quite low. This is especially true when combined with other internal and external factors (Kollmuss and Agyeman, 2002). Nevertheless, knowledge and how it helps to explain the behaviours of outdoor recreationists were discussed in Phase 2 and Phase 3 of this research. Participants in the interviews were asked if they felt that "the behaviours exhibited by recreationists were an accurate reflection of their knowledge?" Some experts believed that as knowledge increased, the likelihood of pro-environmental behaviour would increase. For example, TRE04 felt that "a lot of recreational users are not aware of the right thing to do by and large. Moreover, any negative behaviour would be a result of a lack of knowledge or understanding rather than a lack of care".

According to other interviewees, there existed an acute shortage of self-awareness in Irish outdoor recreationists regarding what their behaviours are and how they can have an impact on the natural environment. For instance, TRE02 believed that it is a

complete lack of "education, awareness and lack of self-awareness around people's behaviours and choices and decision making", which could explain the discrepancy between behaviours and knowledge. TRE03 expanded on this by suggesting that not only are outdoor recreationists unaware of the impact of "their actions" but addressing the negative impacts associated with outdoor recreation is "somebody else's job".

Most experts in both Phase 2 and 3 advocate the importance of education in their work in the promotion of environmental issues. Nevertheless, the knowledge–behaviour gap still persists in the literature. There have been numerous theoretical frameworks that have investigated where the gap lies between possession of environmental knowledge, environmental awareness and practising of environmental behaviours (Kollmuss and Agyeman, 2002). Although hundreds of studies have been carried out within a variety of contexts, to date, no definitive answers have yet been found. There is a general consensus among researchers that only a small amount of pro-environmental behaviour can be explained using knowledge or environmental awareness. Other scholars suggest that knowledge itself is not an influence on environmental behaviour. Instead, knowledge should be seen as more of a modifier of environmental awareness and values. TRE05 believed otherwise and suggested that "as they become more knowledgeable, their behaviours are changing. People are becoming more clued into the negative impacts on the environment".

Despite knowledge appearing not to have a strong influence on behaviour, this does not mean knowledge should be seen as unimportant. BCE13 argued that without informing the public of the "why" then "we are just going to create more problems

as humans". This suggests that the exchange and communication of ideas is important in intervention design. Instead, further work needs to be done to examine how knowledge is presented to the public (Jensen, 2002; Ojedokun and Balogun, 2010, 2013), which has major implications for organisations like Leave No Trace Ireland.

There is a significant amount of literature informing the public about what pollution is and its effects on the natural environment; there is even a substantial amount of literature on the causes of this pollution and how recreational activities can affect natural ecosystems. This type of knowledge can be useful, for instance, the impact of trail erosion or dog fouling may instil a sense of environmental concern among outdoor recreationists. Unfortunately, this type of knowledge is largely scientific in nature and, if used in isolation, may also instil a sense of hopelessness in an outdoor recreationist's ability to reduce adverse impacts on the environment. The distribution of knowledge and the design of communication strategies is discussed in greater detail in Section 5.5.

In summary, the scoring for environmental knowledge was lower than the scoring of environmental attitude. An analysis of the data would suggest that not only are participants unaware of the negative impacts associated with some of their actions, but that some behaviours which are harmful to the environment are carried out with the belief that they cause no negative impacts. This highlights the need for a unified message in order to better teach environmentally responsible behaviour in recreational areas across Ireland.

4.3.3 Social/Subjective Norms

Subjective or social norms, as described by Ajzen (1991, p.188), "refers to the perceived social pressure to perform or not to perform the behaviour". Social norms are seen as a significant influence on behavioural intention in the theory of planned behaviour (TPB) and have been the topic of numerous studies (Heywood and Murdock, 2002; Thøgersen, 2006, 2008). This section begins by discussing the total scores obtained by the on-site user completed surveys in Phase 1. The results from the expert interviews in both Phase 2 and Phase 3 of the research in relation to the influence of social norms on behavioural change are then considered. Finally, the inclusion of social norms into the behavioural framework is discussed.

Investigating the Influence of Social Norms on Recreationists

Using the same methods as were used to measure attitude, a total of 5 statements were chosen to measure social norms. It was challenging to obtain a Cronbach's Alpha Score above 0.7: one reason for this is the difficulty in testing for perceived pressure to conform to social norms. While other factors such as knowledge and attitude can be more obvious, perceived social pressure can be subtle in its effects. The scale had an internal consistency of 0.65; there is research that posits that internal consistency of above 0.6 is acceptable (Daud et al., 2018). The results of the case processing can be seen in Table 4.15.

Table 4.15 Case processing and reliability statistics for social norm scale

Case Processing Summary				Reliability Statistics	
		N	%	Cronbach's Alpha	No of Items
Cases	Valid	190	95.0	0.65	5
	Excluded[a]	11	5.0		
	Total	201	100.0		
a. Listwise deletion based on all variables in the procedure.					

A scale to measure social norms was established. The statements that were used to

construct the scale can be seen in Table 4.16.

Table 4.16 Statements chosen to measure social norms in survey respondents

Statement	N
Joining community clean-up efforts helps the environment.	196
I practise (ERB) because the law says I should	195
There is no point in doing what is right in the environment unless others do the same.	195
I practise ERB because the people I recreate with believe it is important.	194
I get upset when I see other individuals are not following ERB.	194

The social norms scale had a median score of 83 (n = 190), with an interquartile

range of 15 (see Table 4.17).

Table 4.17 Frequency scoring for social norms scale

Statistics		
N	Valid	190
	Missing	11
Median		82
Skewness		-0.709
Std. Error of Skewness		0.176
Kurtosis		-0.019
Std. Error of Kurtosis		0.351
Range		22
Minimum		13
Maximum		35
Percentiles	25	71
	50	82
	75	86

This result suggests that participants of this survey are influenced by normative

social influence, which is the type of social influence that leads to conformity

(Thøgersen, 2004; Hagger and Chatzisarantis, 2005; Nolan et al., 2008; Truelove et

al., 2014). Looking at the distribution of scores with a bar chart gives a better

illustration of the scale (see Figure 4.14), and the skewness of the data is more

apparent.
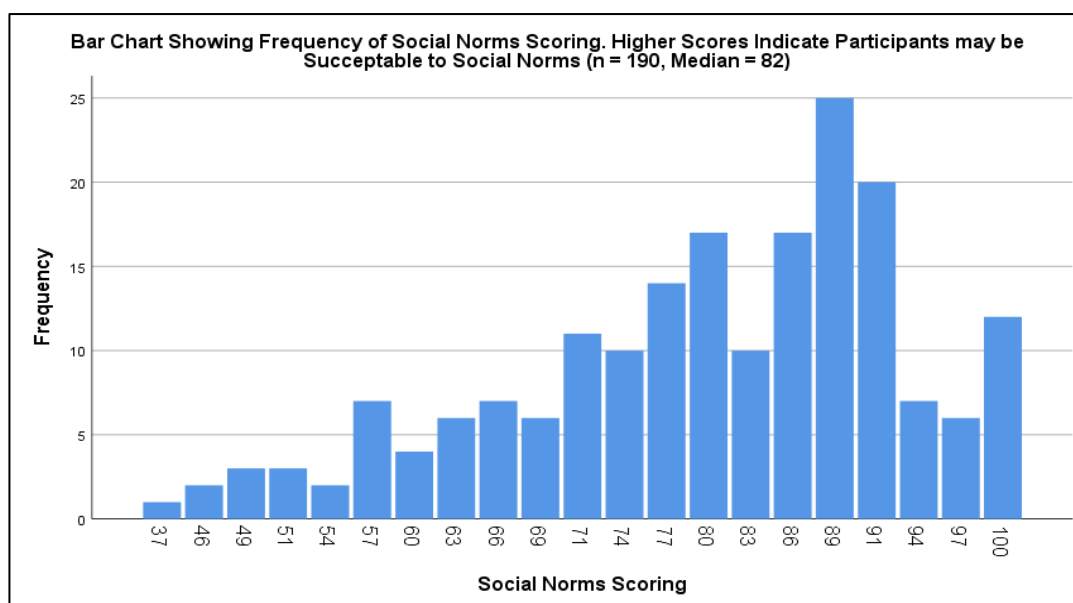
Figure 4.14 Frequency distribution of social norm scale (N=190)

Social norms have been suggested as a means to influence people into performing behaviours that are against their attitudes and beliefs (Nolan et al., 2008; Thøgersen, 2008; Schultz et al., 2018). Considering the high levels of environmental attitude seen in an earlier section of this chapter, social norms might override the personal attitudes of recreationists and thus hinder the practice of environmentally responsible behaviours (ERB).

In discussion with the behavioural change experts during Phase 3 of the research, the importance of social norms and the influence of community engagement were identified as crucial factors in the success of behavioural interventions. Notable examples can be seen in discussions with BCE12 and BCE14, both of whom are involved in behavioural change in Ireland. BCE12 described the efforts in designing behavioural change at an individual or small group level and how in recent times they have begun engaging with local communities in their behavioural intervention challenge efforts.

Building on the work of affecting attitudes and knowledge discussed previously,

BCE12 aimed to inspire environmentally responsible behaviour at an individual level. These individuals can then affect their immediate family and their local communities to engage in responsible behaviour or to raise awareness of an issue.

BCE12 described their experience with communities in Ireland, particularly rural Ireland. BCE12 posited that in rural Ireland, "the community comes together and bands together and helps". This point was also met with caution as BCE12 mentioned that at times Ireland can have a pack or group mentality: "Irish communities can still have a mindset of different parishes or a GAA mindset". The importance of consideration and consultation with local communities when designing a behavioural intervention is illustrated by these comments. If caution is not given to identifying relevant communities or groups and to target interventions that are amenable to these groups, some interventions may fail to have a substantial impact. This was echoed by BCE12 when they stated that "rural communities band together when they know something good is going to happen, they also band together when something devastating happens". This illustrates the importance of community in efforts to change behaviour.

Aside from rural communities, BCE12 also indicated that community groups can also be found in urban areas like Dublin. BCE14, however, had different opinions on the value of social norms and community involvement. BCE14's work involved the entire island of Ireland and so must target a much wider audience. BCE14's efforts involved the development of initiatives that can be dispersed throughout the country with a singular message.

It is interesting to note that while both are involved in behavioural change, BCE12

and BCE14 have developed interventions differently. BCE12 developed interventions engaging local communities at a small-scale level, whereas BCE14 attempted to reach a broader consensus. While the evidence and the literature would argue that both types of intervention have merit, this research would suggest that attempting large-scale interventions without tailoring to local communities as described by BCE12 could impact their success. BCE14 mentioned this when they described the difficulty that they have in achieving their goals. In fact, BCE14 mentioned this as one of the most significant learning points that they faced by explaining the need "to be aware where other people were coming from and be aware that where I'm coming from is not the same for every person".

Differences in Social Norms Scoring among Demographics

As discussed in Section 4.3.1, there are variations in the scoring of attitude among demographics. A Mann–Whitney U test revealed a significant difference in the scoring of social norms between males and females ($U = 6{,}313$, $z = 5.433$, $p < 0.000$, $r = 0.39$), as seen in Table 4.18.

Table 4.18 Mann–Whitney U test summary for social norms across gender demographics

Statistics	
Total Number (n)	189
Mann–Whitey U (U)	6,313.500
Standardised Test Statistic (z Score)	5.433
Asymptotic Significance (p)	< 0.001
Effect Size (r)	0.39

The median score for men was 74 with an interquartile range of 23. Women had a higher median score of 87 with an interquartile range of 14. Table 4.19 illustrates the differences between genders in relation to social norms scoring.

Table 4.19 Social norm scoring descriptives between gender demographics

Gender		
Male	**Statistic**	**Std. Error**
Median	74	

	Statistic	Std. Error
Minimum	37	
Maximum	100	
Range	63	
Interquartile Range	23	
Skewness	-0.297	0.274
Kurtosis	-0.556	0.541
Female	**Statistic**	**Std. Error**
Median	87	
Minimum	49	
Maximum	100	
Range	51	
Interquartile Range	14	
Skewness	-0.884	0.228
Kurtosis	0.768	0.453

Studies have used the perceived gender roles as a means of studying the effect of social norms in the past (Cialdini, Kallgren and Reno, 1991; Mostafa, 2007). The results of the test suggest that social norms could have more influence on women when compared to men. This influence could possibly be due to the onslaught of pressure to conform achieved through advertising which targets women in modern society (Bedford and Johnson, 2006).
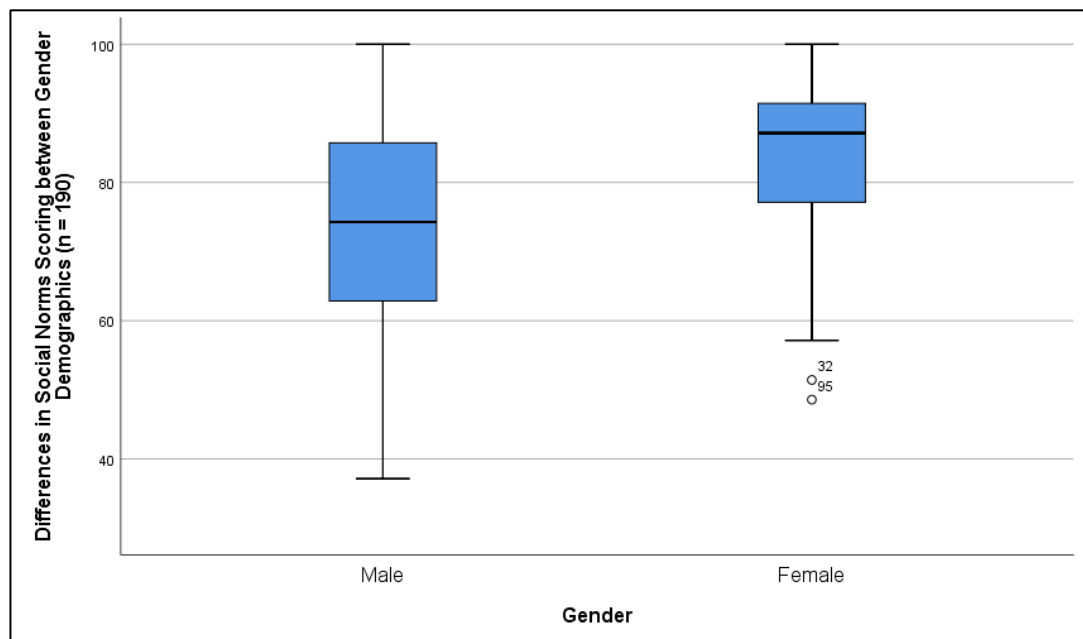
Figure 4.15 Box plot showing differences in scoring between men and women with regards to social norms (n = 190)

The box plot seen in Figure 4.15 gives a more visual representation of the data. This suggests that although women have been shown to have higher levels of

environmental attitude and knowledge to men, they are more susceptible to the need to conform to society. This does not mean that men are unaffected by social norms. For instance, researchers have used social norms in an effort to reduce violence in communities and to end violence against women (Fabiano et al., 2003; Berkowitz, 2008).

There is much research on the effect of social norms and how it can affect young people in our society. Results of the Kruskal–Wallis test seen in Table 4.20, reject the null hypothesis and support the conclusion that social norms can be influential in different age groups.

Table 4.20 Kruskal–Wallis test summary for social norms between age demographics

Statistics	
Total Number (n)	189
Standardised Test Statistic (z Score)	21.36
Asymptotic Significance (p)	< 0.01
Degrees of Freedom	6

The scores of participants of different age groups showed variation in scoring for social norms. The groups with the lowest median score tended to be on the edges of the scale (that is, the 18–24, 55–62 and 63+ age ranges), while the age range of 25–46 had the higher score (median = 86). A possible explanation of the lower scoring of social norms seen in the 18–24 group could be a relatively low number of participants from this age category. A full list of the descriptive statistics for social norms between age demographics can be seen in Appendix J. Figure 4.16 illustrates the scoring by age demographics using a box plot.
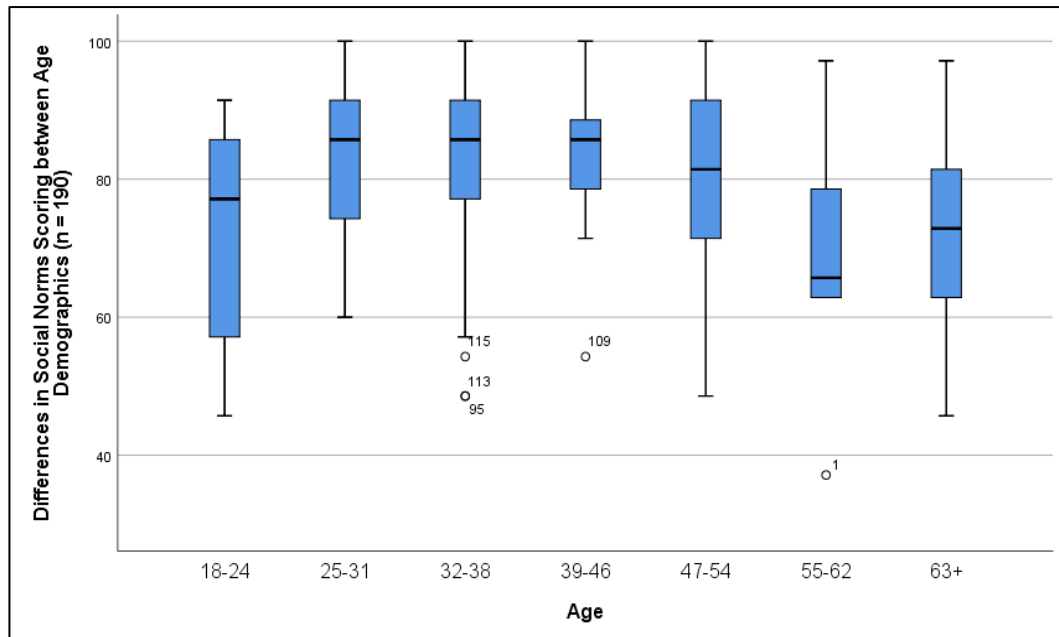
Figure 4.16 Box plot for social norms scoring among age groups

The low score for social norms seen in 18–24 age category is surprising given that numerous studies have attempted to use social norms as a predictor of alcohol consumption in college students and suggest that social norms are the best predictor in this population (Perkins, 2002; Neighbors et al., 2007). A possible explanation for this discrepancy could be the context in which these behaviours take place. College life for many people is the first experience of freedom, with that comes the need to discover personal identity and the pressure to conform can be significant. These studies demonstrate the value of incorporating social norms when investigating the intention to perform a behaviour. Most respondents who had a median score lower than the total median for social norms (that is, < 82) were aged 47+. Considering that only 33% of respondents (n = 201) fell into this category (see Section 4.2.1), this could suggest that age may be a determining factor in whether a person feels the pressure to conform (Wiernik, Ones and Dilchert, 2013).

Interestingly, the Kruskal–Wallis test initially failed to reject the null hypothesis for the differences in scoring for social norms by education. Combining the data groups

into two groups (one group combined primary and secondary education, while other group included all third-level education), which was done for the Chi-square test in Section 4.2.2, enabled a Mann–Whitney U test to be conducted. This test then found a statistical difference between the two education groups, as shown in Table 4.21.

Table 4.21 Mann–Whitney U for social norms score through educational demographics

Statistics	
Total Number (n)	186
Mann–Whitey U (U)	3,858
Standardised Test Statistic (z Score)	2.727
Asymptotic Significance (p)	< 0.01
Effect Size (r)	0.199

Participants of this survey who indicated secondary level as their highest level of education had the lowest median for social norms (median = 74). While there are relatively few respondents in this category, it could suggest that education has an effect on the influence of social norms.
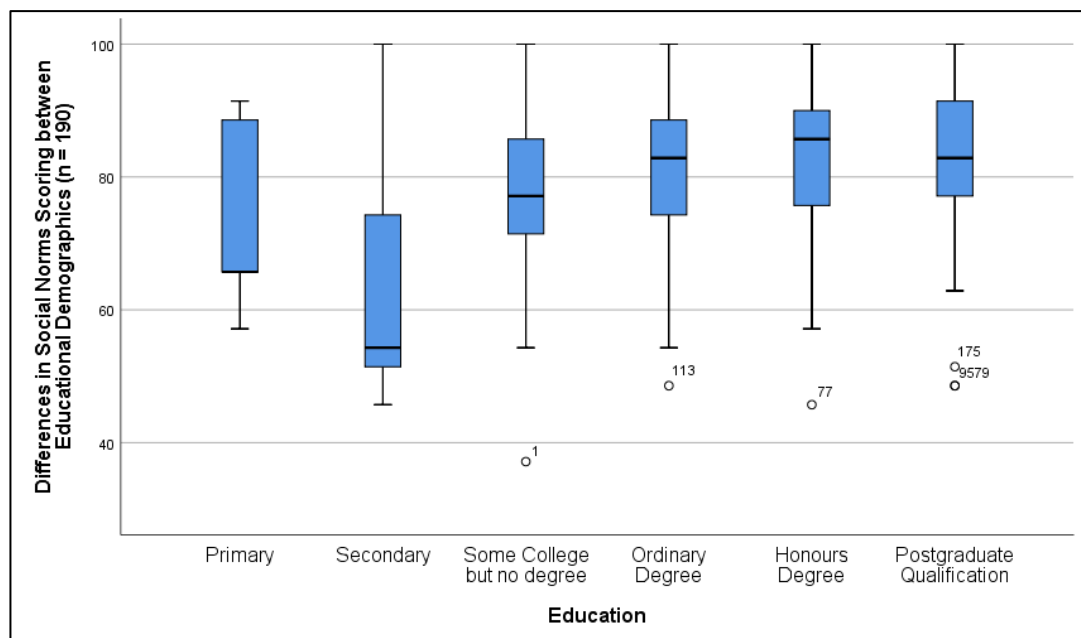
Figure 4.17 Box plot showing the scoring of social norms through educational demographics

The box plot illustrates that the influence of social norms is greater with higher levels of academic achievement (see Figure 4.17). This could suggest that by choosing a

non-skilled career, a person may place more importance on their basic needs (See Section 4.3.2). As such, less importance is given to self-fulfilment and psychological needs as described by Maslow's hierarchy of needs (Maslow, 1943), which in turn may lessen the influence of social norms in their behaviours.

There is an abundance of literature studying the effect of social norms in the college environment (Perkins, 2002; Fabiano et al., 2003; Neighbors et al., 2007). Rimal and Real (2003, p.189) describe college "as a period when students experience a great deal of ambiguity, as they cannot rely on many of the habitual behaviours familiar to them in previous years". Social uncertainty can cause many students to adhere to normative influences, and this seems to be evident in this research. If promoting the practising of ERB as the socially acceptable and favourable thing to do, the desire to conform may cause outdoor recreationists who do not have a strong environmental attitude to practice ERB. This suggests that by focusing on social norms and by making environmentally responsible behaviours the apparent normative behaviour, the levels of compliance will increase. The analysis of the data would suggest that the desire to conform to the group norm can be a significant factor in behavioural motivation, which has been evidenced in the literature (Ellis, 2005; Vagias, 2009; O'Driscoll, Claudy and Peterson, 2013). In the future, incorporating social norms into the design of behavioural intervention may induce more success than by just relying on education or environmental awareness.

Variation in Adherence to Social Norms Across Topics

The findings of Section 4.3.3 stated that the median score for social norms was 82 (n = 190). This section investigates the influence of social norms across selected statements. Some of the phrasings of statements of this survey were reversed to

reduce response bias. Two statements appear to contradict each other. Although the initial statement did not aid in the development of the scale of social norms, the obvious link and contradictions in answering are worthy of note. The statement "Other people's opinions have no effect on my practising ERB" revealed that over 70% of respondents (n = 194) agreed with this statement (See Figure 4.18).
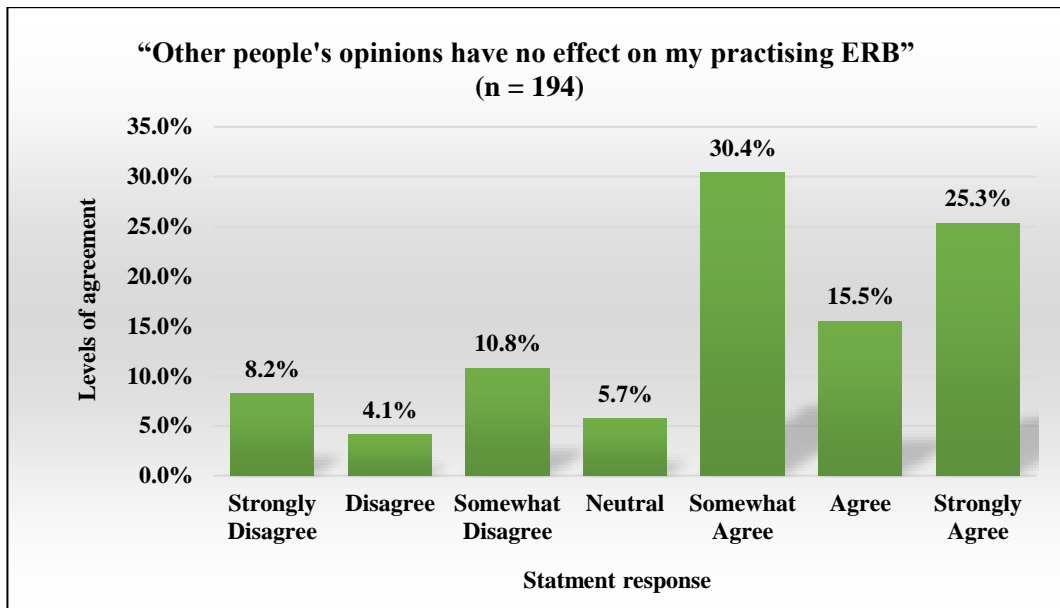
Figure 4.18 "Other people's opinions have no effect on my practising ERB", showing the percentage scores of respondents (N=194)

This finding suggests that social norms do not have much influence on the behaviours of participants in this survey, which contradicts the cumulative score of social norms found previously. This contradiction raises a couple of questions, namely, are the respondents denying the influence of social norms on their behaviour or is the influence of social norms influencing the respondent subconsciously? This data would suggest that participants are not aware of the influence of social norms or, at least, they do not believe that the pressure to conform applies to them. This is a noteworthy finding considering the influence of social norms found in the population of respondents as well as the variation seen between the different demographics. It highlights the importance of incorporating social norms into the design of

behavioural interventions but also cautions against the over-reliance of its application.

The data would suggest that a number of demographic groups did not experience the same pressure to conform as others. As such, creating a behavioural intervention heavily focused on social norms might not have as much effect across all demographics. Instead, it is important to understand the target population in which behaviour change is needed. The accumulation of findings in this research highlights the need for a theoretical framework in the design of behavioural interventions: thus far each of the internal factors has been shown to be an effective motivator of behaviour to some degree. Conversely, each of these factors has been shown to be ineffective in certain circumstances. In order to design an intervention for long-term behavioural change, a comprehensive framework which identifies the factors that can be adapted to suit the intervention would be more successful than a rigid theory.
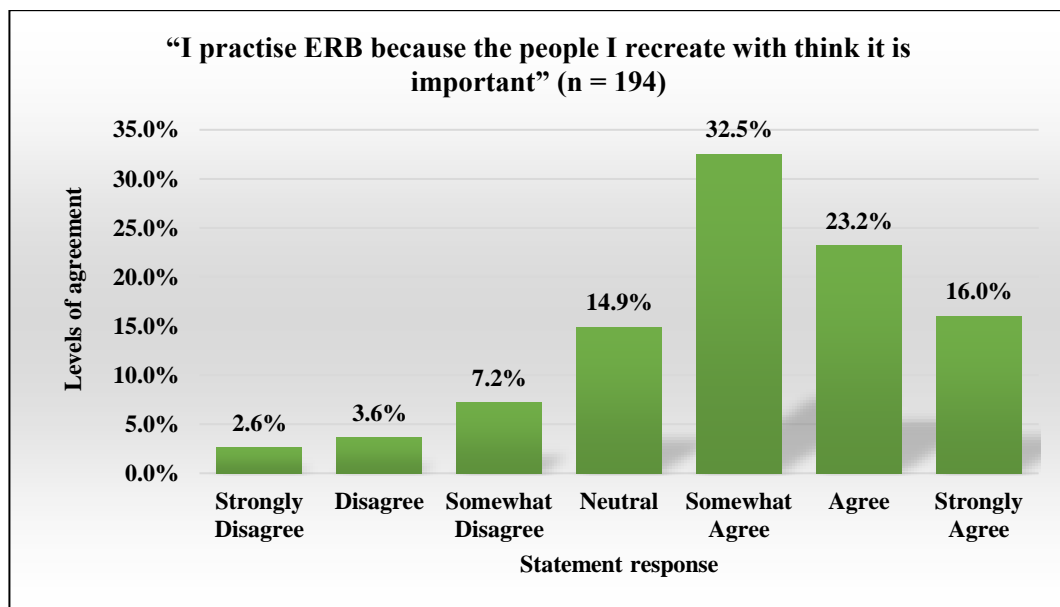
Figure 4.19 "I practise ERB because the people I recreate with think it is important", showing the percentage scores of respondents (N=194)

The results for the statement "Other people's opinions have no effect on my practising ERB" were compared to the results for the statement "I practise ERB

because the people I recreate with think it is important" (See Figure 4.19). Over 70% of respondents (n = 194) agreed with the second statement. Even though these statements contradict each other, a majority of respondents agreed with both of them. This raises an interesting point: to what extent are people aware of the influence of social norms on their behaviours?

Social norms could be seen as a much more subtle motivator for compliance, particularly when compared to attitude and knowledge (Cialdini and Goldstein, 2004). This type of influence, described by Cialdini and Goldstein (2004, p.592) as "subtle, indirect, and non-conscious", has been used to bypass a person's rational thought process (attitude and knowledge) to motivate the desired behaviour. A well-known example of the subtle influence of social norms can be found in a study conducted by Freedman and Fraser (1966). The foot-in-the-door technique examined in this study illustrated that by conforming to one request, an individual is more likely to conform to another. The influence of compliance on future behaviour cannot be underestimated and is of significant interest to this research. If recreationists can be convinced to comply with a singular small behaviour, the opportunity for a spill-over of compliance into other behaviours might occur, which has been seen in the literature (Truelove et al., 2014; Lauren et al., 2016). It is also important to recognise that, unfortunately, social norms have been the focus of expressions of prejudice in society. Crandall, et al. (2002) found a significant correlation between the public expression of prejudice towards various social groups and the social approval of that expression.

Social Norms and the Attitude–Behaviour Gap

Research suggests that outdoor recreationists, and people in general, have a positive

attitude towards the environment and do not wish to behave in a way that would be harmful to the environment (Juvan and Dolnicar, 2014). This concept is supported by the positive environmental attitude found in the participants in this survey and the views expressed in the expert interviews in both Phase 2 and Phase 3. However, TRE01 asserted that although there is a pro-environmental consciousness present in outdoor recreationists, trying to encourage responsible recreation continues to be difficult: "getting them to recognise that they have a responsibility to take good care of the environment".

Social norms may present one way in which to bridge the evident attitude–behaviour gap, which is frequently seen in the literature. Studies have proposed that social norms can be an effective tool in the promotion of sustainable food consumption and that factors such as social norms can influence behaviours even when attitudes to perform those behaviours are negative (Vermeir and Verbeke, 2006). While experts may not have mentioned social norms by their name, it is clear that the majority of respondents have identified the influence of communities in affecting behavioural change. In particular, BCE10 aimed to increase the number of groups cleaning coastlines throughout Ireland. Even without mentioning social norms and the uses of a social context in behavioural intervention, BCE10 identified the influence of creating a social dynamic into their interventions. This could be seen as another example of using the subtle influence that social norms and conformity can have on an individual's behavioural intention. BCE09 discussed the use of social norms in their interventions, in particular, how they would incorporate social norms if they could change anything about their previous studies. This was a noteworthy development as it suggests an acceptance that reliance on attitudinal or educational messaging may not be effective in long-term behaviour change. Instead, a deeper

understanding of social norms and perceived difficulty could increase the adoption of environmentally responsible behaviours.

The use of theory in the behavioural change interventional design is discussed in greater detail in Section 5.8. It is interesting that although few of the behavioural change experts mentioned social norms specifically, most experts indicated some aspect of social norms in their work. BCE09 further noted that, in the future, they would be incorporating social norms and perceived difficulty in their interventions at a higher level.

BCE10 argued that while social norms do have a number of uses in behavioural change, more effort should be put into identifying the social identity of recreationists and utilising that in the design of behavioural interventions. Social identity is discussed further in Section 4.3.6, particularly its use in the design of behavioural interventions.

If variation in environmental attitude is affected by social norms, then it is imperative that research is undertaken to incorporate group dynamics into the design of interventions aimed at outdoor recreation in Ireland. By understanding group dynamics, a pro-environmental approach using social norms could have a more immediate uptake when compared to the promotion of environmental literature alone. This desire to conform to other people's perception of standard behaviour presents both an opportunity and a barrier to the development of environmentally responsible behaviours. The evidence given justifies its incorporation into the proposed theoretical framework.

4.3.4 Perceived Behavioural Control

As suggested in the literature (see Section 2.7.5 and 2.7.6), a person's behaviours can be determined by a large number of interrelating factors and, therefore, a person's PBC should be seen as a contributor rather than a determinant of behavioural intention.

Perceived Behavioural Control of Outdoor Recreationists

For PBC to be examined for inclusion in the framework, a scale of PBC had to be developed that would allow for the scoring of participants. This was done using similar methods employed in earlier sections (see Section 4.3.1). A total of 13 statements were chosen to measure perceived behavioural control. The scale had an acceptable internal consistency of 0.801. The test summary is outlined in Table 4.22.

Table 4.22 Case summary and reliability test for perceived behavioural control

Case Processing Summary				Reliability Statistics	
		N	%	Cronbach's Alpha	No of Items
Cases	Valid	189	94	0.801	13
	Excluded[a]	12	6		
	Total	201	100.0		
a. Listwise deletion based on all variables in the procedure.					

These statements were then combined, and a scale to measure the PBC of participants was obtained. The statements chosen are listed in Table 4.23. Some of these statements may appear similar to statements that were used in the formation of both attitudinal and knowledge scales. These statements, however, refer to the perceived difficulty of practising these behaviours.

Table 4.23 Chosen statements for PBC scale

Statement	N
Prepare for all types of weather, hazards, or emergencies before heading out.	198
Clean up somebody else's rubbish.	198
Schedule my trip to avoid times of high use.	198
Stay on designated or established trails.	198
Walk through a muddy trail or puddle.	198
Carry out all litter like plastic bottles and packaging.	198

Not removing objects from the area, even small items like a rock, plant, stick or feather.	198
Clean up after another person's dog.	198
Not approaching, feeding or following wildlife.	198
Take breaks away from the trail and other visitors.	198
Take away food scraps like crumbs, fruit peels and cores.	198
It is not sometimes difficult to practice ERB.**	194
Practising ERB does not take too much time.**	194
** indicates field where reverse wording was used, original can be seen in Appendix A. Such statements needed transformation so higher scores indicate high levels of PBC	

The median score for PBC was 77, with an interquartile range of 13 (see Table 4.24).

Table 4.24 Frequency table for PBC scoring

Statistics		
N	Valid	192
	Missing	9
Median		77
Skewness		-1.380
Std. Error of Skewness		0.175
Kurtosis		3.559
Std. Error of Kurtosis		0.349
Range		83
Minimum		14
Maximum		97
Percentiles	25	69
	50	77
	75	82

This result suggests that participants feel that they can influence the events that affect their lives.
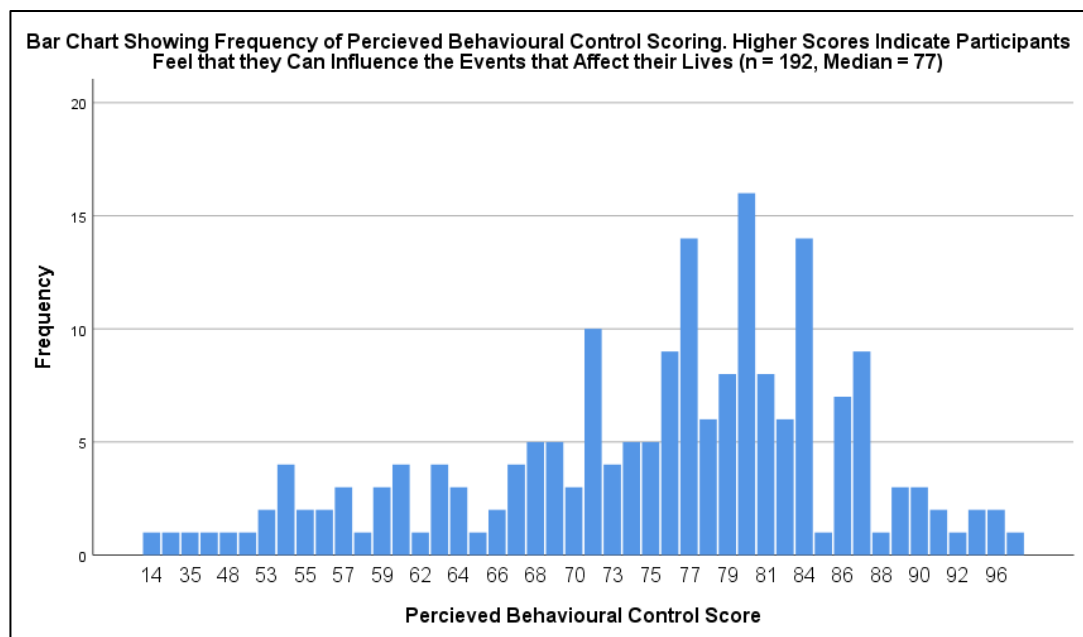
Figure 4.20 The distribution of PBC scoring for Phase 1 survey (N 192)

The distribution seen in Figure 4.20 illustrates the skewed data as well as the positive kurtosis, which suggests that respondents possessed high levels of PBC in clustered peaks with low frequencies towards the ends of the scale. As illustrated by Bandura, higher levels of self-efficacy or PBC can lead to some benefits to humans in both the accomplishment of goals and in the pursuit of personal well-being (Bandura, 1994). Bandura goes further to explain that people with higher levels of PBC approach "situations with the assurance that they can exercise control over them. Such an efficacious outlook produces personal accomplishments" (Bandura, 1994, p.2). The high levels of PBC found in this survey of outdoor recreationists, coupled with the extensive literature on the health benefits related to outdoor recreation, suggests that participation in outdoor recreation could contribute to the PBC of participants (Comhairle Na Tuaithe, 2006; Godbey, 2009; Pietilä et al., 2015; Romagosa, Eagles and Lemieux, 2015).

The Effect of Demographics on PBC

As seen in Section 4.3.1, 4.3.2 and 4.3.3, there are variations in the scoring among demographics. Using similar techniques discussed previously, a Mann–Whitney U test revealed a significant difference in the scoring of PBC between males and females (U = 5,779.500, z = 3.557, p < 0.000, r = 0.26). The results are given in Table 4.25.

Table 4.25 Mann–Whitney U test summary for PBC across gender demographics

Statistics	
Total Number (n)	191
Mann-Whitey U (U)	5,779.500
Standardised Test Statistic (z Score)	3.557
Asymptotic Significance (p)	< 0.000
Effect Size (r)	0.26

Women had a higher median score of 79. Of the total range of scores, only 14

participants achieved a score of less than 51%. The lowest-scoring participants were predominantly male, who showed a larger interquartile range as well as more variance in the data. The results are given in Table 4.26.

Table 4.26 PBC Scoring between gender demographics

Gender		
Male	**Statistic**	**Std. Error**
Median	74	
Minimum	32	
Maximum	92	
Range	30	
Interquartile Range	18	
Skewness	-0.866	0.269
Kurtosis	0.792	0.532
Female	**Statistic**	**Std. Error**
Median	79	
Minimum	14	
Maximum	97	
Range	83	
Interquartile Range	11	
Skewness	-1.987	0.229
Kurtosis	8.755	0.455

The box plot in Figure 4.21 illustrates the smaller range seen in the female respondents compared to men.
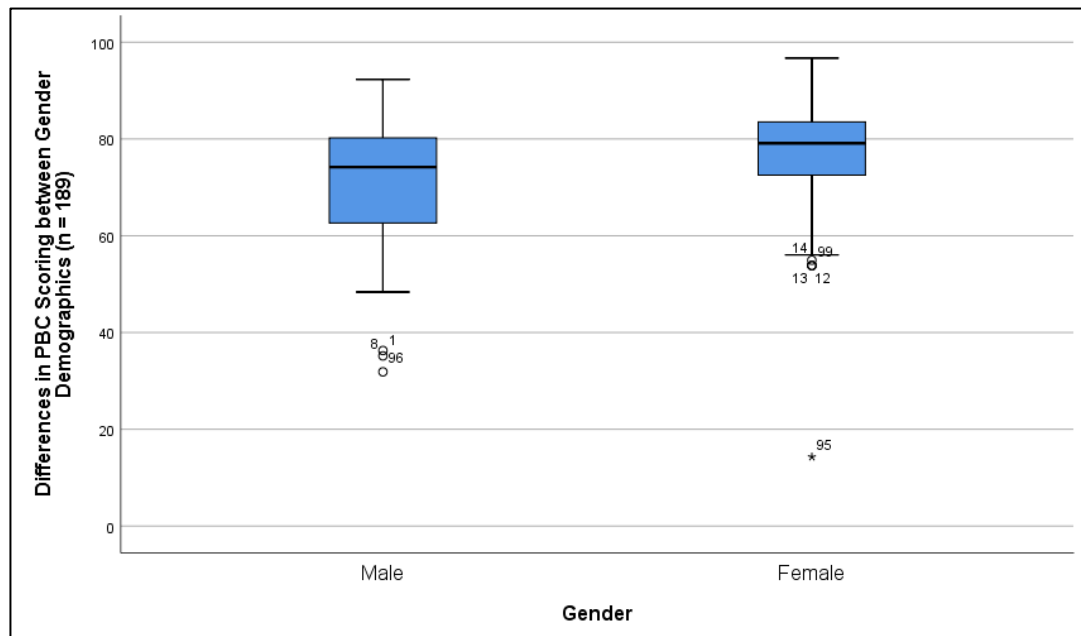
Figure 4.21 Box plot showing differences in scoring between men and women with regards to PBC

As seen previously in this study and the literature, women tend to have a more pro-

environmental attitude than men. According to the literature, however, men tend to have more knowledge of environmental processes (Mostafa, 2007; Lee, Park and Han, 2013), although this was not found in this research. The higher score of PBC evident in female respondents suggests that there could be more confidence in the female population that responsible behaviours can contribute to the protection of the environment. Furthermore, the data suggest that women feel that the responsibility to practise environmentally responsible behaviours (ERB) is shared by all.

Tests conducted examining the differences between demographics failed to reject the null hypothesis for the following variables: age, nationality and whether a person was a tourist or not. When several groups were combined, education did produce a statistically significant difference, as seen in Table 4.27.

Table 4.27 Test summary Mann–Whitney U for PBC score through educational demographics

Statistics	
Total Number (n)	188
Mann-Whitey U (U)	3,966.500
Standardised Test Statistic (z Score)	2.530
Asymptotic Significance (p)	< 0.05
Effect Size (r)	0.19

Respondents who did not receive any form of third-level education had a lower median score when compared to respondents who had received a third-level education (the full list of descriptive statistics for PBC using education can be seen in Appendix K).

The results could suggest a negative link between education and PBC. For instance, young people who choose a career via higher education follow a more structured pathway: they are informed of requirements to attend college, they are supplied with educational materials, and they receive financial aid from multiple sources. This

career path allows a person the freedom to further develop their social networks and their beliefs about some topics as well as preparing them for a career in their chosen discipline (Bandura, 1997b). In Ireland, attendance in school is mandatory until the age of 16 or after three years of post-primary education are completed. People who choose not to move into higher education and instead move into the unskilled sector may be faced with much more uncertainty in their lives. The growing uncertainty and ambiguity in the economy and society could be a cause for a reduction in PBC, as financial, living and family concerns could take precedence over concern for the environment.

Variation in the Level of PBC Across Topics

While the previous section examined the cumulative score for PBC, this section examines individual statements to investigate the variation in PBC across various subjects. As described in the literature review (see Section 2.7.6), there is a debate that PBC consists of two different concepts, namely, a behaviour being "under a person's control" and "being easy/being difficult", which are not necessarily the same thing (Trafimow et al., 2002). To examine this, the two proposed concepts of PBC were investigated.

The Perception that Behaviour is Under a Person's Control

The first concept involves the perception that participants believe practising ERB is under their control or their responsibility. Participants were given a series of statements that aimed to assess the level of ERB that is under a person's perceived control. An example would be the statement "Practising ERB does not reduce the environmental damage caused by other land use" (see Figure 4.22).
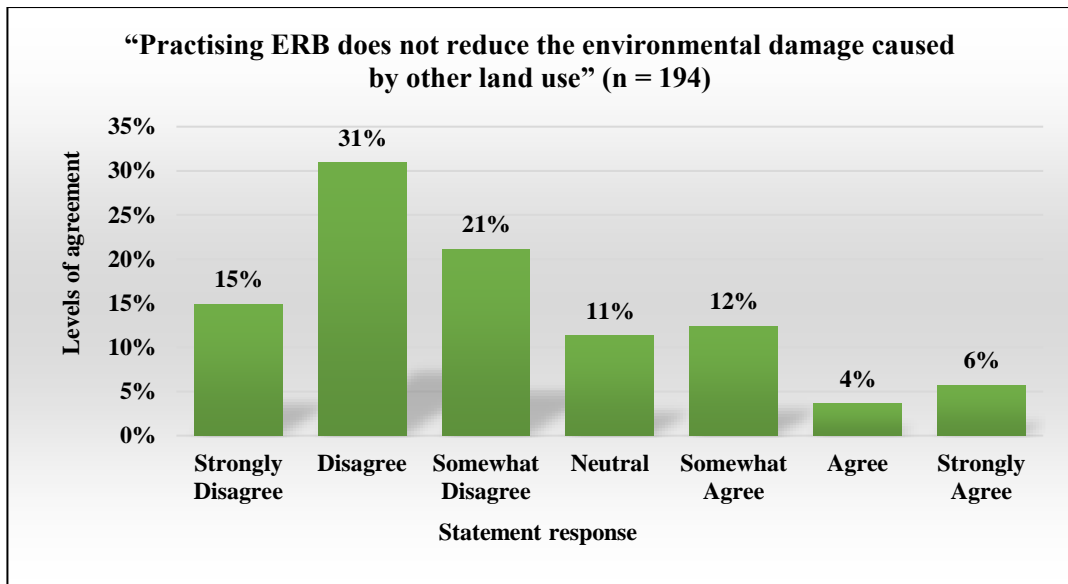
Figure 4.22 "Practising ERB does not reduce the environmental damage caused by other land use", showing the percentage scores of respondents (N=194)

Most respondents (67%) disagreed to some extent with this statement, with over 45% stating that they strongly disagreed or disagreed. This result would suggest that the participants felt that the practising of ERB does reduce adverse impacts on the environment and that they can make a difference. This belief is echoed in a similar statement: "It is just too difficult for someone like me to do much for the environment". The results for this statement showed that 78% of respondents felt that they had the capacity to change the environment in a positive way. The study by Motherway, et al, found a similar belief in their respondents as over 57% of respondents disagreed with the same statement (Motherway et al., 2003). The higher level of agreement observed in this survey could be due to the difference in time and changing cultures between this research and the study conducted by Motherway, et al (2003). However, it is also possible the participation in outdoor recreation can foster self-belief and a need to protect the environment (Lee and Jan, 2015).

For the statement "My actions don't matter if others don't behave responsibly", the vast majority of respondents (>80%) felt that their behaviours were relevant to the

environment regardless of the actions of others. These results suggest that if PBC is divided into the perception that behaviour is under a person's control (Trafimow et al., 2002), then respondents possess a strong sense of control over their behaviours in the outdoors. During the development of this concept in the expert interviews, TRE03 suggested that one of the main challenges involved with the promotion of ERB was that "everybody is saying it is somebody else's job" and a major task was trying to explain that ERB is the responsibility of all people. TRE02 further developed this point by suggesting that, in the context of ERB, as a nation, people "don't actually see it as their role to do it". The lack of personal responsibility to take care of the environment could be a serious problem as it increases the difficulty of promoting an environmental message to outdoor recreationists who do not see it as their concern.

Perceived Difficulty of Performing a Behaviour

The second concept put forward by Trafimow, et al. (2002) is the perceived difficulty of performing a behaviour. If performing an ERB is seen to be harder than the behaviour currently carried out by the outdoor recreationists, then the willingness to engage with ERB can be affected. Unfortunately, behaving responsibly in the outdoors can be more time-consuming and involve more effort on the part of the outdoor recreationists. Therefore, it is important to evaluate the perceived difficulty of performing ERBs by outdoor recreationists. To test this, participants of the survey were presented with two similar sets of statements. The first set of statements was used to determine if the participants thought that performing these behaviours would have a positive impact on the environment. In the second set of statements, participants were asked to express the perceived difficulty of performing these behaviours.

The results of the survey suggest that the perceived difficulty of carrying out ERB while in the outdoors was low. For most statements presented to the participants, the level of perceived difficulty in performing ERB was below 16%. However, there were some exceptions to this finding. Participants were asked to evaluate the difficulty of "cleaning up after another person's dog". The performing of this behaviour was seen to be at least somewhat difficult in approximately 79% of respondents. It raises an interesting issue as to why the cleaning up after a dog was seen to be so difficult despite the negative associations that respondents had towards dog fouling. In Section 4.3.2, the majority of participants indicated dog fouling as inappropriate behaviour and as harmful to the environment. What is interesting to note is that participants know that dog fouling is detrimental to the environment, but they also feel that it would be difficult to clean up if they encountered dog fouling. This suggests that it is somebody else's responsibility to reduce negative impacts, which, in turn, could be a concern for organisations who try to encourage dog owners to take responsibility for their pets. Similarly, the statement asking about the perceived difficulty of "cleaning up someone else's rubbish" was seen as at least somewhat difficult by approximately 26% of respondents. While this figure is lower than cleaning up after another person's dog, there is a connection in that participants were not asked the perceived difficulty of cleaning up after themselves or their dog, rather, they were asked to clean up after another person.

This distinction between cleaning up after ourselves and cleaning up after another person is interesting as, although a significant proportion of negative impacts to the environment are caused by negligent or careless actions by recreationists, there is still some damage that is resulting from malicious intent, for example, vandalism, illegal dumping and poaching. TRE05 suggested that "the indiscriminate dumping

of rubbish" is becoming a major impact in recreational areas. These impacts are unique in that they are not necessarily a by-product of unskilled or careless recreation; rather it can be a result of antisocial or illegal behaviour: "you see beer bottles and remnants of barbeques, but you would also see the remnants of household rubbish". If outdoor recreationists perceive that cleaning up after other people is too difficult a task, then the negative impacts caused by these uncaring/uninformed recreationists will go unresolved (unless by government agencies). This could have long-lasting effects on the environment. This point reinforces previously discussed statements that the impacts to the environment taken at the individual level are intangible, whereas more efforts need to be made to make recreationists aware of the cumulative effect of numerous impacts to an area.

Although the statement "I do what is right for the environment, even when it costs more money or takes more time" did not aid in the development of the scale of PBC, the obvious link makes it worthy of note. The majority of respondents in Phase 1 agreed with this statement (67.6%), this suggests a strong belief and personal efficacy in protecting the environment. The study by Motherway, et al. (2003), also noted an agreement with this statement by respondents, albeit a smaller one (60.8% in 1992 and 53.7% in 2002). The difference between personal commitment observed between this research and the study conducted by Motherway, et al. (2003), could suggest that participation in outdoor recreation can alleviate doubt in the practising of ERB.

Increasing perceived behavioural control could be challenging with regard to outdoor recreation. As discussed earlier, the performing of individual ERBs is not seen by survey respondents to be overly difficult. Most respondents (54%) expressed some

disagreement with the statement "sometimes it is difficult to practice ERB"; however, there was a significant number of respondents who felt that behaving responsibly is more difficult in the broad sense, than when compared to individual statements. This suggests that public perception of the difficulty of practising ERB in the broad sense is higher than when behaviours are examined on an individual level, which could be an interesting development for the promotion of environmentally responsible behaviours. Instead of trying to promote environmental programs involving all aspects of ERB, this research suggests that a more tailored approach should be adopted. By targeting specific negative impacts, there is a possibility of encouraging what is known as a spill-over in the practising of ERB (Truelove et al., 2014; Lauren et al., 2016). The spill-over effect is described by Lauren, et al. (2016, p.1) as "when engagement in a pro-environmental behaviour increases the likelihood of engaging in other pro-environmental behaviours". Research is emerging into the positive spill-over of environmental behaviours (Lauren et al., 2016). While there are some examples of positive spill-over, there are some results that appear contradictory (Thøgersen, 2004; Truelove et al., 2014; Lauren et al., 2016). More research is needed to investigate the efficacy of this theoretical concept (Truelove et al., 2014; Dolan and Galizzi, 2015).

4.3.5 Past Behaviour

What makes the inclusion of past behaviour an important component of the proposed framework is how it interacts with other internal factors. For instance, a person's attitudes (for the most part) are not formed over a singular occurrence or by random chance. Instead, attitudes are formed by experiences and lessons that a person has learned throughout their life. The following section examines how habit can be a

barrier and an opportunity for the promotion of environmentally responsible behaviours.

In discussion with the behavioural experts in Phase 3, some of them indicated that even with the production of behavioural interventions and surveys, there are still a number of discrepancies between observed and reported behaviour. It raises the question as to how to change behaviour when the recreationist is not aware of their behaviours. This has been identified as an issue seen in the literature from a number of disciplines (Whitelaw et al., 2000; Bjerke, Thrane and Kleiven, 2006). BCE08 discussed a series of studies that they are conducting in which participants and recreationists are unobtrusively observed during the recreation. The recreationists are then surveyed at the end. One of the main aims of this study is to examine the differences or similarities between the reported behaviour and the observed behaviour. Although the results have not been published yet, several other studies have shown that a person's reported behaviour does not completely reflect their observed or actual behaviours. This could indicate unawareness in the population of their actual behaviours in the outdoors. This is in line with cognitive dissonance theory (Baumeister and Bushman, 2013), and it corresponds with a number of comments made by the experts in Phase 3, particularly in the areas of using consequences and guilt.

When working with cognitive dissonance, it is important to consider the way in which the dissonance is made apparent. Studies have shown that argumentative or negative messaging can have an effect on the level of cognitive dissonance and the desire to change (Trafimow and Borrie, 1999; Manning and Valliere, 2001; Kollmuss and Agyeman, 2002; Whitmarsh, O'Neill and Lorenzoni, 2011). The research on

observed behaviour is an interesting topic. One of the criticisms that this research has made regarding the use of behavioural theory is the apparent lack of empirical evidence. Investment into quantifiable observations in order to examine the effectiveness of behaviours could reveal a significant amount of valuable information. The use of observation in behavioural interventions could aid in the evaluation of educational and attitudinal approaches as well as aid in the tailoring of future interventions.

In order for long-term behavioural change to occur, longitudinal research needs to be conducted, which will allow for the evolution and dissemination of behavioural change interventions. As discussed in the literature review, the potential to relapse into past behaviours can be a significant problem (Kwasnicka et al., 2016). Emphasis should be given to the maintenance of pro-environmental behavioural change and the formation of environmentally responsible habits. Instead of a single instance of research, analysis and reporting of data, behavioural change in the context of outdoor recreation needs to be practical, adaptable and quantifiable.

Several experts have contended that guilt and description of consequences have had a significant effect on the behavioural interventions they have employed. BCE09 advocated that guilt, in conjunction with social norms and perceived behavioural control, could be a significant focus for behavioural intervention. Designing an intervention incorporating the past behaviour of recreationists which illustrates the consequences of their actions could be effectively illustrated by the use of imagery and communication strategies, which is discussed in more detail in Section 5.5. It is an interesting approach as it not only attempts to affect a recreationist's current behaviour but makes them aware of any previous behaviours that they may have

conducted. From consultation with the experts, and from a review of the literature, the use of past behaviour and the ascription of consequences and guilt in behavioural interventions would require a significant level of skill in design and implementation.

Based on previous sections of this chapter as well as from a review of the literature, a confrontational approach should be avoided when using factors such as past behaviour and consequences. There is a potential for miscommunication and confrontation if recreationists feel that an intervention is seen as targeting them individually. This sentiment was echoed by several behavioural experts; in particular, BCE10 stated that it is important to remember that "People have lives" and outdoor recreation is only a small element of their lives. Several experts have stated that many people participate in outdoor recreation to remove themselves from stressful life and to enjoy the freedom of the outdoors. A confrontational approach used to assign guilt or blame could be counterproductive to the overarching goal which is to inspire responsible recreation.

The evidence suggests that it is important to recognise and identify the past behaviour of recreationists when designing an intervention. This will enable the focus to be on immediate problems and the design of a communication strategy that raises awareness of the consequences of the previous behaviour are in a non-confrontational way. By doing so, this creates an opportunity for a participant to seek further information on how to increase their knowledge, skills and perceived behavioural control.

4.3.6 Social Identity

Social Identity had been discussed in the literature review, however it had not been

incorporated into the framework initially. The analysis of the data allowed the importance of social identity to emerge in Phase 2 and Phase 3. It became apparent through the expert interviews that in order to effectively design an intervention that successfully influences visitors to an area, it was necessary to discuss how a recreationist might identify themselves (Raymond, Brown and Weber, 2010; Mols et al., 2015). BCE11, who is a behavioural psychologist, discussed several interesting points and used the smoking ban in Ireland, which is examined in the literature review, as a good example of the influence of social identity on behavioural intention. The introduction of the smoking ban has been seen as a great success for behavioural health change. BCE11 argued that the introduction of the smoking ban had some consequences that had not been predicted. An aspect of the smoking ban was that exclusion from the group would cause pressure on a smoker to quit. Instead, the segregation caused the formation of new social groups that met outside premises "so people and groups and relationships were growing from smoking groups" and the smoking ban created commonality between smokers. BCE11 continued this thread by explaining that smoking became part of a new group identity, and "the central component of the new group was that a person had to smoke". This was counterproductive to the idea of the smoking ban as it created a support system for smokers, which highlights the importance of monitoring and evaluation in the design of behavioural interventions.

Discussion on this topic with several experts revealed some interesting points. Social identity has, in one form or another, already permeated through recreation ecology and behavioural change in outdoor recreation. Throughout the interview process, experts had identified recreationists in their groups. For instance, some experts in behavioural change have targeted walkers, dog walkers, cyclists, runners and rock

climbers. The use of labels in describing the different types of recreationists has allowed experts to discuss the conflicts that can occur between the different recreational groups. BCE08 highlighted the number of activities that can occur simultaneously on public lands, in addition to the increase in numbers visiting rural and countryside areas. The potential for conflict between these groups grows as interventions designed to affect one particular group may not have a significant influence on the other. In order to effectively design a behavioural intervention, it is important to be able to correctly identify the social identities involved.

The presence of intergroup conflict has emerged in other areas of the research, for instance, Phase 2 interviewees expressed opinions on the more non-compliant recreationists. TRE03 argued that walkers generally behaved in the outdoors while TRE04 felt that motorised boating, quad biking and mountain biking had a more visible impact on the environment. An interesting aspect of social identity is that a person can belong to several different groups at any one time. As a social psychologist, BCE11 further reasoned that the relationship with authority is complicated further by our history and our identity as Irish people. This complication stems from how Irish people prefer to view themselves as a nation and how they believe the world views them, also known as the meta-stereotype (Kim and Oe, 2009). For example, an Irish person has a sense of what it means to be Irish; at the same time, they would have a sense of what the rest of the world thinks Ireland is. This suggests that the design of behavioural change interventions should consider not only the individual, but also the meta-stereotype as social identities can be a significant motivator for behaviour. Unfavourable examples of this are racism in the United States as well as sectarian violence in Northern Ireland. BCE11 explained that some of these identities are very hard to move away from, especially in situations

where people are very dug in. Thankfully, recreation ecology is not as divisive an issue as the mentioned examples.

Of particular benefit to the design of behavioural interventions is the need to understand the aspects of social identity. Several behavioural change experts showed hesitation in using the phrase "change behaviour". Instead, a number of experts preferred to use phrases such as making people "aligned" with their "ethics". It could be seen as more beneficial to align a social identity with intended behaviour rather than change the identity. For example, making a "no littering attitude" a part of being an Irish recreationist could have a strong motivational effect. Conversely, attempting a behavioural change that is opposed to a social identity could be met with severe pushback. This is an interesting thought considering the proclivity of Irish policymakers to use initiatives created in other countries.

This section examined the social identity as a motivator of behaviour. How a person identifies themselves can affect their interactions with people of the same or different groups as well as the efficacy of communication from outside influence. The building of many relationships involves trust, how this trust is gained or lost and the impact that trust can have on behavioural intention is discussed in Section 4.3.8

4.3.7 Place Attachment

From discussions and analysis of expert interview data in Phase 2 and Phase 3 of the research, the concept of place attachment emerged as one of particular importance. Place attachment is referred to as the internal belief that a person has a connection to the land, not the legal rights to the property, which is discussed in Section 5.4. Table 4.28 provides examples of the opinions of experts regarding the importance of place

attachment.

Place attachment in this section describes how a connection to a recreational area can serve as an influence to perform environmentally responsible behaviours. Referring back to Section 4.3.1, it has been established that a high level of pro-environmental attitude was identified with recreationists. This finding was corroborated with experts in both Phase 2 and 3. BCE10 posited that the creation of events that increased the enjoyment of local areas could instil a sense of ownership and place attachment in the population. This place attachment could be then used to instil action as the local population would then wish to protect something that is important to them. This argument is supported by TRE01 who stated that one of their main objectives was to show people "that the quality of the environment around them contributes significantly to the quality of their recreation experience". This finding is supported in the literature as research suggests that place attachment may play a significant role in the promotion of environmentally responsible behaviour (Ramkissoon, Weiler and Smith, 2012; Ramkissoon, Smith and Weiler, 2013). Building on these findings, a number of experts argued that a more inclusive approach to land management might instil a sense of place attachment in recreationists. For example, BCE11 suggested that a new approach to signage be introduced which is used "to remind people that we own this".

Table 4.28 Place attachment thematic development with examples from Phase 2 and Phase 3 experts

Place Attachment: Opinions of Experts from Phase 2 and Phase 3
"Once they have enjoyed the event and the beach clean-up. We try to instil action when we can" BCE10
"You create a sense of ownership of a place. You take a local place and you change the signage to remind people that we own this" BCE11
"Just getting people to care, getting people to see that the quality of the environment around them contributes significantly to the quality of their recreation experience" TRE01

The importance of ownership was discussed further by BCE09, however, BCE09 provided an example in which place attachment and ownership had become a challenge. The example given by BCE09 involved the fundraising and campaigning of a local population to develop and protect a green space in the United States. The local community was successful in doing so, however, this created a sense of ownership that acted as a barrier to the promotion of environmentally responsible behaviours. BCE09 posited that the development of place attachment had made the local population unresponsive to interventions from outsider influences. As BCE09 stated "there are an awful lot of on undesignated trails that just aren't being managed and have been established for years". This demonstrates that place attachment can be a significant influencer of behavioural intention. This concept is supported in the literature as a study by Lee (2011), who posited that place attachment can induce and encourage the intention to perform environmentally responsible behaviours. New studies, investigating the influence of place attachment have also suggested a relationship between place attachment and the intention to preform environmentally responsible behaviours (Lee and Oh, 2018; Chow et al., 2019; Ajani, 2019).

It has been an objective of a number of interventions to change the perspective of recreationists in the outdoors (Brown and Raymond, 2007; Vagias, 2009). TRE04 expounded upon the idea that the motivation to participate in outdoor recreation comes from a need to "connect with outdoors and have a consciousness to the natural environment". This motivation offers the potential to build the place attachment of an area. If a person feels emotionally connected to an area, they are potentially less likely to engage in irresponsible behaviour. BCE12 continued on this thread by explaining the use of place attachment in their interventions. BCE12 argued that supplementing the provision of knowledge with efforts to instil place attachment can

be beneficial, BCE12 posited that building on the "head and heart and emotionally connecting" people to the area can inspire them for positive environmental action.

BCE13 had previously described the spiritual connection to the land and the efforts to incorporate this into future intervention designs (See Section 4.3.2). Factors such as place attachment and social identity serve as a foundation upon which behavioural interventions can be built. It is necessary to understand these factors in order to design an intervention that can more accurately target the attitudes, knowledge and PBC of the audience. A case could be made that place attachment should be categorised as an aspect of attitude. However, by separating place attachment in the framework, a more tailored intervention to be designed that creates a platform of other factors to interact, thus increasing their potency.

4.3.8 Trust

Social relationships of all types can rely heavily on the trust between parties. When the concept of relationships was discussed with interviewees, the breakdown of trust and conflict between recreational users and landowners was seen as a major issue. In relation to "access conflict" and the breakdown of trust, TRE01 noted that "the strain only becomes visible when there is a problem. It's based on trust like any other relationship. It's like a piece of elastic, if you pull it too far it won't go back to the way it was before". Interviewees were asked if their organisation's reputation has impacted any of their programs. Most agreed that a good reputation is a vital component of a relationship, for instance, TRE03 felt that when you approach people with a good reputation "people will be definitely more willing to work with you. There is no doubt about it".

The issue of trust and its importance to the design of behavioural interventions was discussed further with experts in Phase 3. BCE10 identified trust as one of the crucial factors in developing a behavioural intervention. They argued that in order to develop a successful intervention in Ireland "you need to build the level of trust between the people you want to get involved with and want to do things with". In addition, they contended that a level of honesty is important in building this trust.

Participants in the survey were asked how trustworthy a number of groups were in giving correct information about the pollution. The groups considered were business and industry; environmental groups; government bodies; newspapers; radio or TV programmes; and university research centres. Participants rated the groups from one for very trustworthy to seven for very untrustworthy (see Figure 4.23).
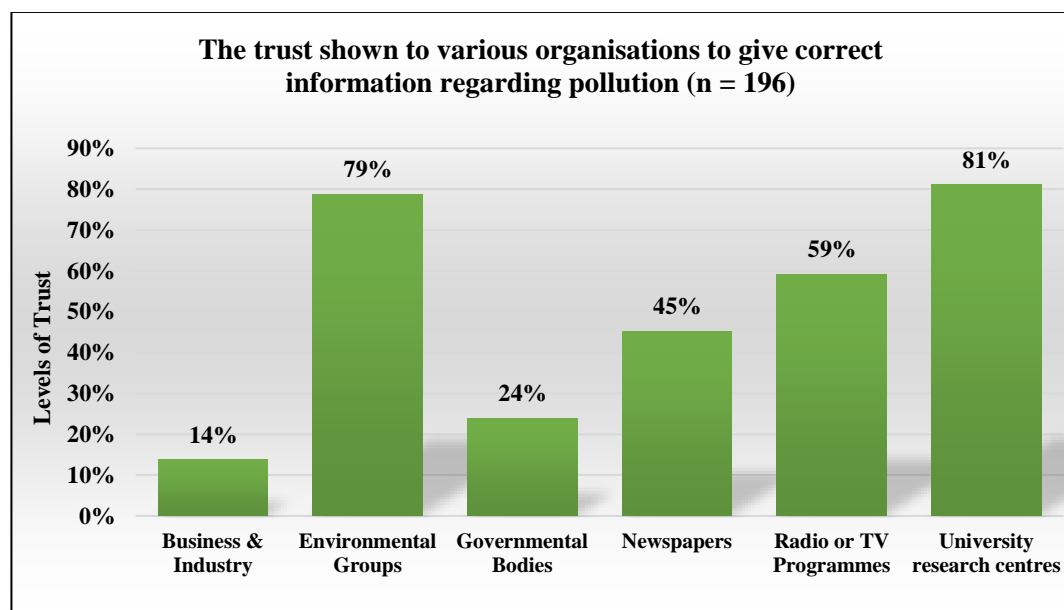
Figure 4.23 The trust shown to various organisations to give correct information regarding pollution, showing the percentage scores of respondents (n = 196)

Certain groups such as business and industry were seen as untrustworthy by survey respondents (Approx. 76%, n = 197), whereas both environmental organisations (Approx. 79%) and university research centres (81%) were perceived as trustworthy.

A distinct lack of trust was given to governmental bodies (24%). This level of trust is similar to results from Motherway, et al. (2003). In the research conducted by Motherway, et al. (2003), despite the low levels of trust shown to governmental organisations, respondents were supportive of direct management approaches to protect the environment. Trust has been mentioned as an important factor in risk assessment and decision making (Slovic, 1999): If you trust where you are getting your information from, then the communication can be much more productive.

Further investigations on the impact of communication techniques suggest interviewees feel that the previous communications between organisations such as Leave No Trace and the general public were ineffective. Perhaps due to the lack of data on the promotion of environmental education in Ireland, a number of experts stated that initially Leave No Trace Ireland adopted a more dogmatic, accusatorial approach to environmental education, with little variation to accommodate different audiences. TRE02 felt that in the past "the same old standard course was rolled out and the 'seven principles' and it was the same for the school kids and up to business". The discussion regarding trust allowed experts to stress the need to tailor a message to suit an audience and to be careful not to exclude individuals and break trust. TRE02 went further to say "environmental training in Ireland preaches to people, it doesn't make it outdoors focused and doesn't make it practical. It doesn't give people enough room to come up with their own solution".

The comments from TRE02 create an interesting disparity between the views expressed in Phase 2 and Phase 3 of this research, and the experiences of TRE02 indicated a poor relationship with environmental education in Ireland. What is interesting is that the criticisms expressed by TRE02 are different from the methods

used by the behavioural change experts based in Ireland. It is interesting to see how the importance of trust can affect people who have a vested interest in the sustainable development of outdoor recreation and activity tourism, which highlights the need to develop trust with visitors to an area. It is crucial that non-governmental organisations aiming to increase participation of ERBs must revise their communication models in ways which are agreeable to the user. The effective use and importance of communication is discussed in greater detail in Section 5.5

4.4   Chapter Summary

This chapter focused on the findings relating to the internal factors of the proposed framework. Additional factors were discussed in relation to their inclusion in the framework. Looking at the emerging framework in Figure 4.1, a number of interesting points can be made. The use of attitude is well documented in the literature, and a pro-environmental attitude was found in respondents to the Phase 1 survey. Discussions with experts in both Phase 2 and Phase 3 of the research indicated that it was important to get support at an emotional level. The use of attitude is one of the core facets of behavioural change in the context of outdoor recreation as many of the visitors in an area possess a need to connect with nature. However, as discussed in the literature review and the interviews with experts, there exists an attitude–behaviour gap, which can limit the influence of attitude towards behavioural intention. Analysis of the survey data in combination with the interviews with experts in both Phase 2 and Phase 3 identified a number of internal factors that could supersede attitude and influence behavioural intention.

The scoring of environmental knowledge was an interesting one. Looking at the bar chart in Figure 4.10, the median and the negative skew suggest a somewhat

reasonable level of environmental knowledge in respondents to the survey. However, the breadth and range of knowledge across certain topics showed variation. It suggests that recreationists were knowledgeable on some topics such as plastic. However, other topics displayed variability in their answering. A possible explanation for this could be the proliferation of media sources advocating the disposal of litter and plastic waste. Yet other behaviours such as trail widening do not receive as much media coverage

Speaking with experts in both Phase 2 and Phase 3, the importance of education and the use of education in behavioural interventions was clear. Some experts advocated that not only did recreationists not know the impact their actions were causing but held the belief that their behaviours did no harm. As discussed in Section 2.4, negative impacts can be intangible in the short term, which present a challenge for environmental education. Several experts advocate the need for explaining "why" an intervention is necessary in order to increase compliance. The response from experts, combined with the survey data, emphasises the need for a combination of factors to be included in the design of behavioural interventions.

Social norms were one such factor, and respondents were seemingly unaware of the subtle influence of social norms on behavioural intention. Experts from Phase 2 and Phase 3 identified the importance of community groups in the development of behavioural interventions, which is of particular interest to this research considering previous attempts to develop eco-tourism without the consent of the local community. The desire to conform can be a powerful motivator for behaviour and can be used in conjunction with other factors to amplify or mitigate the influence of attitude. Past behaviour was an interesting factor to examine as it can be difficult to

quantify into a framework for future behaviour. People form attitudes and opinion as a result of their education and experiences. In addition, humans are creatures of habit: breaking the habitual cycle in favour of more environmentally responsible behaviours might be difficult. However, doing so might cause a spill-over of ERB.

This research highlights the necessity of incorporating past behaviours in order to help engage with individuals and communities and to gain perspective on their way of life. An intervention that would deny communities access to a recreational area would be met with severe pushback without consultation and consideration.

Empowerment and the need to encourage people to behave responsibly in the outdoors was a significant finding in this chapter. Participants to the survey held a belief that they could make a difference with their actions. However, some behaviours were viewed as too difficult or that they were not the responsibility of the recreationist. In discussion with experts in Phase 2 and Phase 3, the concept of PBC was a significant talking point. A number of experts advocated the need to empower visitors to the area using education. The thought-provoking point was that, in the broad sense, participants felt that behaving responsibly in the outdoors was somewhat difficult, yet the perceived difficulty of responsible behaviours was much lower when the behaviours were taken individually. This suggests that interventions should be tailored to show practical information which will inform visitors on how to perform environmentally responsible behaviours.

Building on the concept of empowerment comes the need to instil place attachment in recreationists. Social identity is similar to social norms in that both have been used as a means to enact anti-social behaviours in the past (e.g. racism and sectarianism).

The need to identify with particular groups could be a vessel for change if interventions are tailored to align with the core facets of that group. Interestingly, several experts argued against changing behaviours; instead, efforts should be made to align environmental ethics with groups that an individual might identify with. In order to do so, a relationship will need to be built, which requires trust. This trust can significantly affect the efficacy of interventions for better or worse.

All the factors that have been described in this chapter can have a significant influence on behavioural intention and as such, deserve inclusion in the framework. However, these factors only account for the internal components of the framework. The findings of this research have been separated into a number of chapters to add clarity. The following chapter will continuously refer to the internal factors previously discussed in order to exemplify the constant interaction that the internal and external factors have on both each other and towards behavioural intention.

Chapter 5:   Findings: External Factors

5.1   Introduction

This chapter examines a number of external factors that may influence a person's intention to perform a behaviour. These external factors were identified in the literature review and were investigated using the methodology described in Chapter 3. External factors have the potential to affect the performance of a particular behaviour despite a behavioural intention. For instance, a motivation to stay on trails may be superseded if the trails are in a poor or unsafe condition, a desire to use a particular area could be hindered by restricted access. This chapter will start by examining external factors such as relationships, law, enforcement, access, facilities and culture. Any proposed additions to the framework will be examined and critiqued on their potential merit.

As discussed in the literature review, the application of behavioural change theories in interventions tends to focus on the individual as well as the world around them. Aspects of social cognitive theory and the theory of planned behaviour emphasise consideration of the local environment in which an individual is situated. As such, the design of a framework should consist of external factors as well as internal factors in order to accommodate this concept.

A number of external factors (for example, access, culture and enforcement) could not be adequately analysed using Phase 1 data, as Phase 1 served as a foundation on which themes could be further developed and discussed in qualitative interviews as per sequential triangulation. This chapter highlights the importance of Phase 2 and Phase 3 of this research. While Phase 1 established a reliable benchmark for the creation of themes and the development of a framework, the data gathered from

experts in both Phase 2 and Phase 3 enrich and support these themes and add depth to the creation of a framework.

5.2 Relationships

The first external factor to be discussed is relationships. There are different types of relationships, and this section examines the concept of relationships between and within internal and external factors. These relationships can be numerous and complex, and each can have a significant influence on the intention to perform a behaviour in certain circumstances. This section examines the concept of relationships using the quantitative data from Phase 1 to demonstrate relationships present between several internal factors. The thematic development of relationships is then discussed based on interviews with experts in Phase 2 and Phase 3.

5.2.1 Relationships Between Framework Factors

Observing the theory of planned behaviour, the following section demonstrates the relationships between attitude, social norms, perceived behavioural control (PBC) and knowledge. This is done using correlation. However, since this research does not satisfy the assumptions required to use parametric statistics as described in the methodology chapter (see Section 3.4.6), a non-parametric correlation known as Spearman's rank correlation coefficient was used.

The Relationship Between Social Norms and Attitude

A Spearman's rank-order correlation using Phase 1 survey data was run to assess the relationship between attitude and social norms. One hundred and ninety participants were included. Preliminary analysis showed the positive relationship, as assessed by visual inspection of a scatterplot (see Figure 5.1).
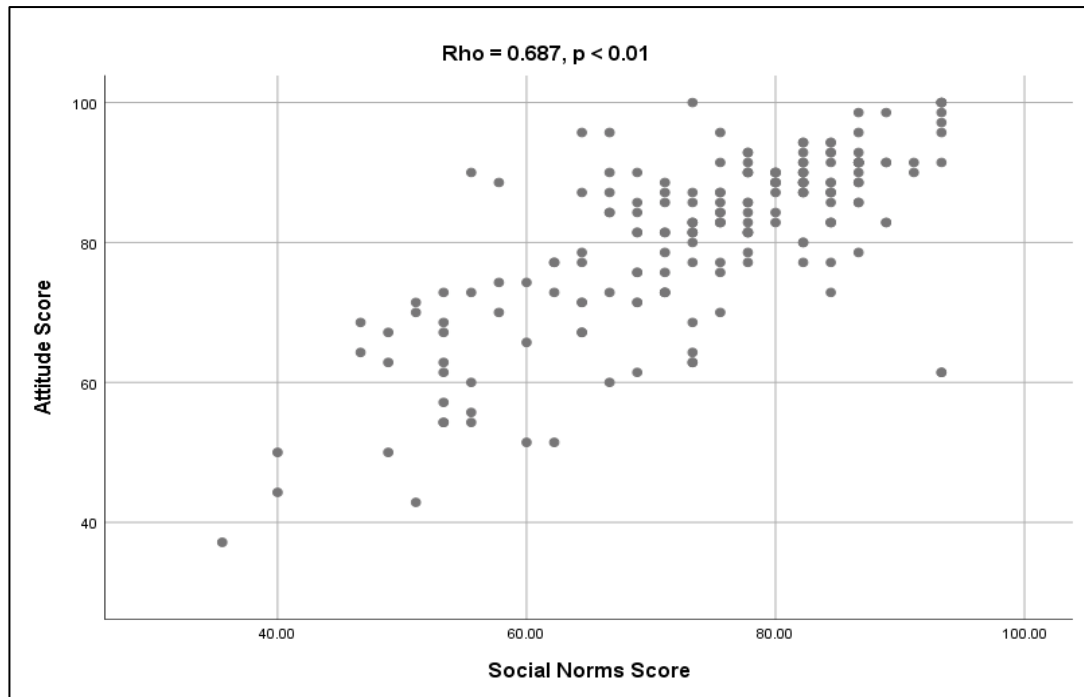
Figure 5.1 The positive relationship between attitude and social norms illustrated by scatterplot

Further testing concluded that there was a statistically significant, strong positive correlation between attitude and social norms (Rho = 0.687, p < 0.01). Table 5.1 summarises the result of the test.

Table 5.1 Results of the Spearman's rank correlation coefficient between attitude and social norms

			Attitude	Social Norms
Spearman's rho	**Attitude**	Correlation Coefficient (Rho)	1.000	.687**
		Sig. (2-tailed)	.	< 0.01
		N	191	190
	Social Norms	Correlation Coefficient	0.687**	1.000
		Sig. (2-tailed)	< 0.01	.
		N	190	190
**. Correlation is significant at the 0.01 level (2-tailed).				

This finding is not surprising considering the factors involved. The strength of the relationship between the scores of attitudes and social norms is of interest, as it suggests that social norms and attitude are interlinked. A possible explanation could be that since our attitudes are developed by our experiences, there is a strong link to what we believe and what we want people to think of us.

The Relationship Between Social Norms and PBC

The second factor to be tested is the relationship between social norms and PBC. As discussed previously, PBC is considered under two headings: the perceived difficulty of performing a behaviour and the perception that behaviour is under a person's control. Since both concepts are subjective, social norms may have a significant relationship with PBC. A Spearman's rank-order correlation was run to assess the relationship between PBC and social norms using Phase 1 survey data. One hundred and ninety participants were included. Preliminary analysis showed the relationship to be positive, as assessed by visual inspection of a scatterplot.
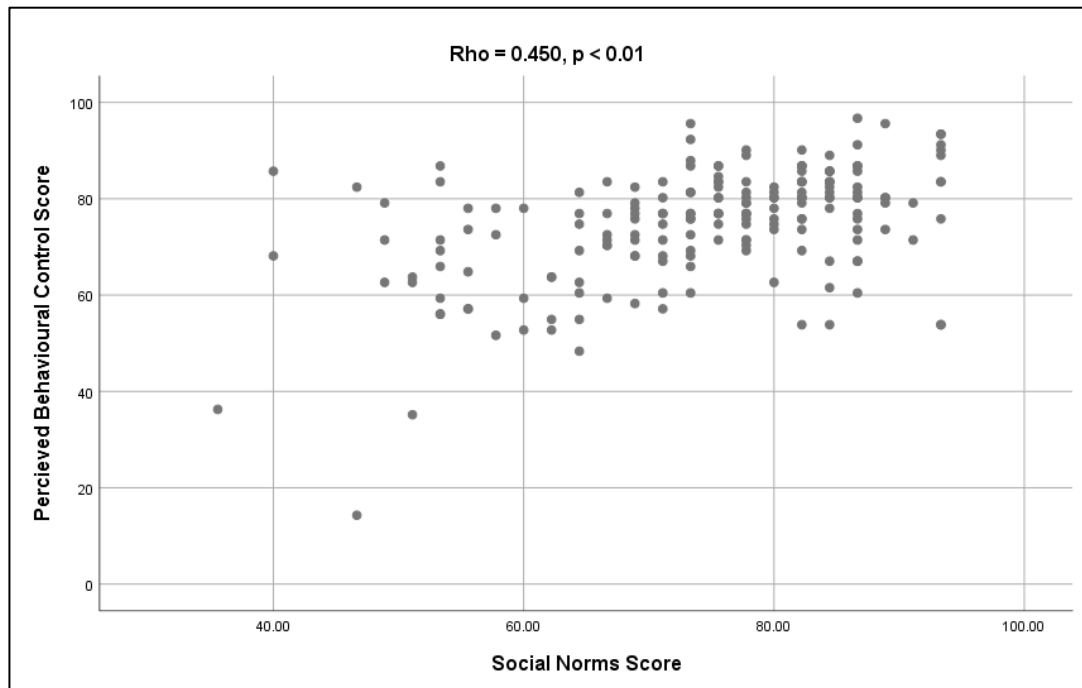
Figure 5.2 The positive relationship between PBC and social norms illustrated by scatterplot

Table 5.2 Results of the Spearman's rank correlation coefficient between PBC and social norms

			PBC	Social Norms
Spearman's rho	**PBC**	Correlation Coefficient (Rho)	1.000	0.450[**]
		Sig. (2-tailed)	.	< 0.01
		N	191	189
	Social Norms	Correlation Coefficient	0.450[**]	1.000
		Sig. (2-tailed)	< 0.01	.
		N	190	190
**Correlation is significant at the 0.01 level (2-tailed).				

Further testing concluded that there was a statistically significant, moderate positive correlation between PBC and Social Norms (Rho = 0.450, p < 0.01). Table 5.2 summarises the result of the test. This moderate relationship could suggest that perceived pressure to conform and individual self-belief are interlinked.

The Relationship Between Social Norms and Knowledge

A Spearman's rank-order correlation was run to assess the relationship between social norms and knowledge using Phase 1 survey data. One hundred and eighty-six participants were included. Preliminary analysis showed the relationship to be somewhat positive, as assessed by visual inspection of a scatterplot.
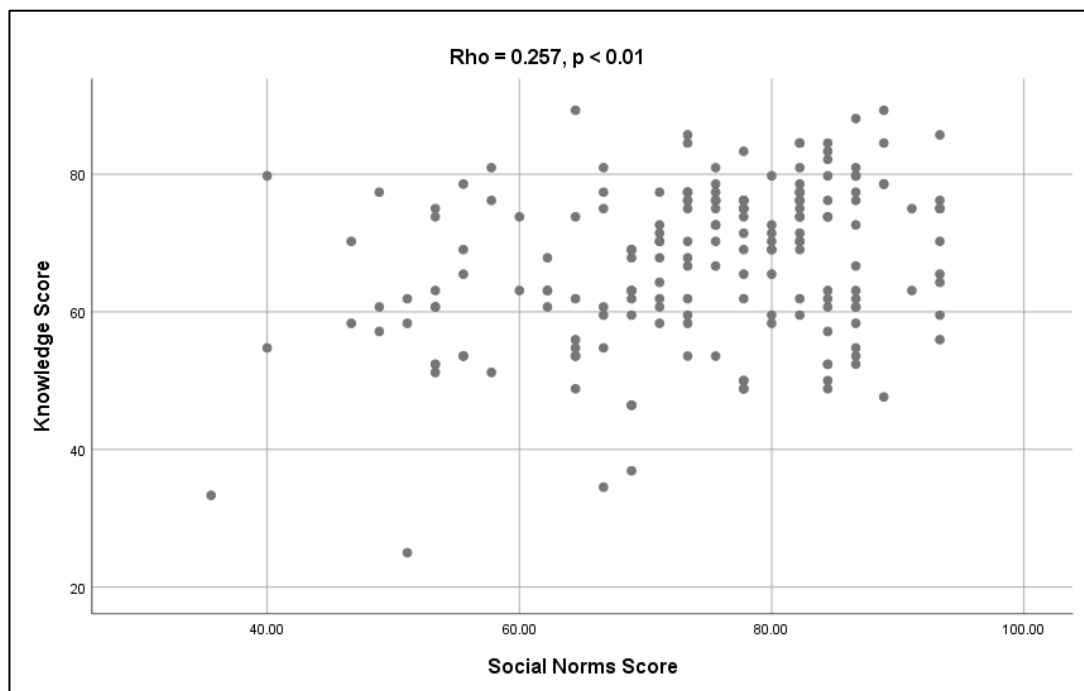
Figure 5.3 The positive relationship between knowledge and social norms illustrated by scatterplot

Further testing concluded that there was a statistically significant, weak positive correlation between social norms and knowledge (Rho = 0.257, p < 0.01). Table 5.3 summarises the result of the test.

Table 5.3 Results of the Spearman's rank correlation coefficient between knowledge and social norms

			Knowledge	Social Norms
Spearman's rho	Knowledge	Correlation Coefficient (Rho)	1.000	0.257**
		Sig. (2-tailed)	.	< 0.01
		N	186	190
	Social Norms	Correlation Coefficient	0.257**	1.000
		Sig. (2-tailed)	< 0.01	.
		N	190	186
**. Correlation is significant at the 0.01 level (2-tailed).				

The relatively weak relationship could suggest that what we know may not be strongly linked to the perceived pressures of conformity.

The Relationship Between Attitude and PBC

A Spearman's rank-order correlation was run to assess the relationship between attitude and PBC using Phase 1 survey data. One hundred and eighty-six participants were included. Preliminary analysis showed the relationship to be positive, as assessed by visual inspection of a scatterplot pictured in Figure 5.4.
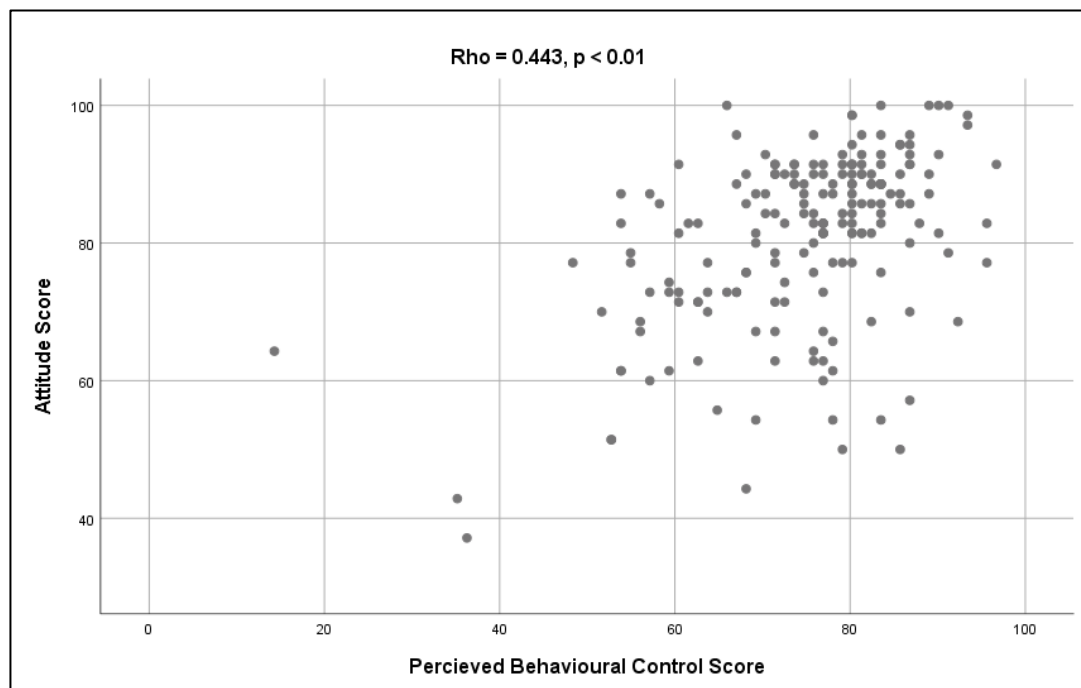
Figure 5.4 The positive relationship between attitude and PBC illustrated by scatterplot

Further testing concluded that there was a statistically significant, moderate positive correlation between attitude and PBC (Rho = 0.443, $p < 0.01$). Table 5.4 summarises

the result of the test.

Table 5.4 Results of the Spearman's rank correlation coefficient between attitude and PBC

			Attitude	PBC
Spearman's rho	**Attitude**	Correlation Coefficient (Rho)	1.000	0.443[**]
		Sig. (2-tailed)	.	< 0.01
		N	186	190
	PBC	Correlation Coefficient	0.443[**]	1.000
		Sig. (2-tailed)	< 0.01	.
		N	190	186
**. Correlation is significant at the 0.01 level (2-tailed).				

The moderate relationship shown between attitude and PBC could suggest that self-belief and the perception of responsibility could be linked with a person's attitude towards a particular behaviour. As such, the development of self-belief, knowledge and skills may be influenced by emotional factors, and vice versa.

The Relationship Between Attitude and Knowledge

A Spearman's rank-order correlation was run to assess the relationship between attitude and knowledge using Phase 1 survey data. One hundred and eighty-seven participants were included. The examination of the scatterplot showed the relationship to be positive (see
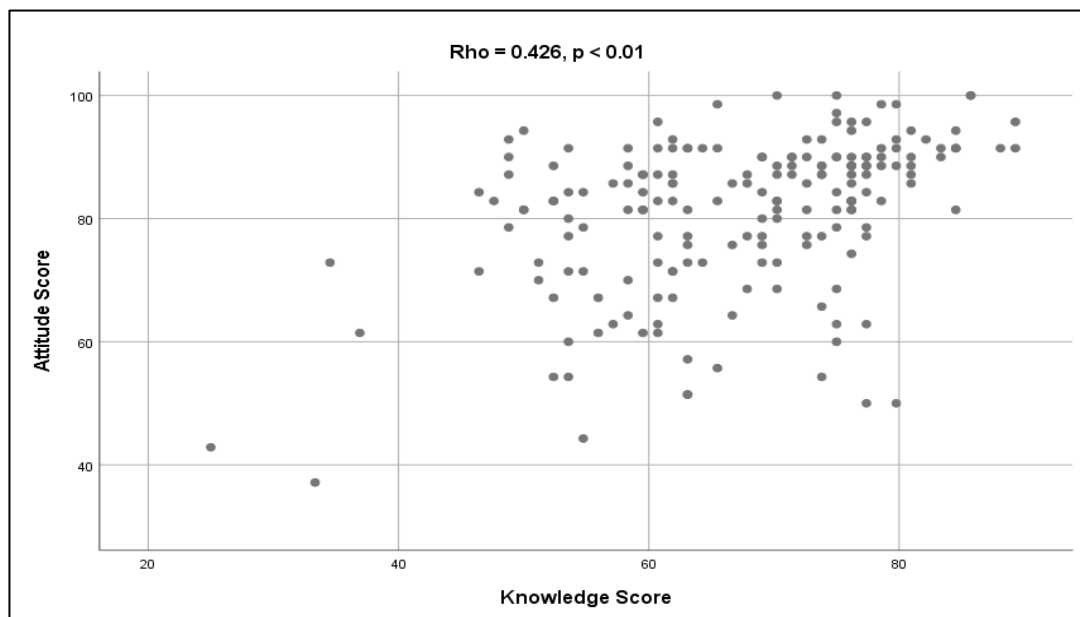
Figure 5.5).
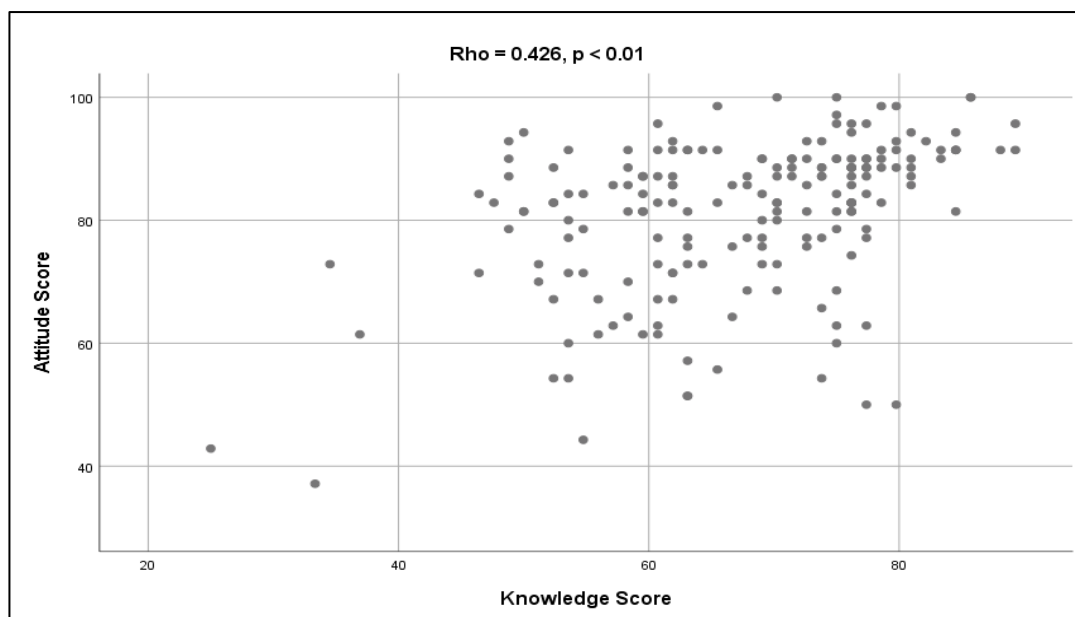
Figure 5.5 The positive relationship between attitude and knowledge illustrated by scatterplot

Further testing concluded that there was a statistically significant, moderate positive correlation between attitude and knowledge (Rho = 0.426, p < 0.01). Table 5.5 summarises the result of the test.

Table 5.5 Results of the Spearman's rank correlation coefficient between attitude and knowledge

			Attitude	Knowledge
Spearman's rho	**Attitude**	Correlation Coefficient (Rho)	1.000	0.426[**]
		Sig. (2-tailed)	.	< 0.01
		N	191	187
	Knowledge	Correlation Coefficient	0.426[**]	1.000
		Sig. (2-tailed)	< 0.01	.
		N	187	195
**. Correlation is significant at the 0.01 level (2-tailed).				

The relationship between the scores of attitude and knowledge could be a result of a number of things. Some research in the field of behavioural change group knowledge and attitude together, this is seen in the theory of planned behaviour (Ajzen, 1991). There can be a reasonable cause to do so, however, what we know about a behaviour, is not the same as our attitude towards the behaviour. For example, thanks to media campaigns and reports by health professionals for decades, most people know smoking is bad for their health (Whitelaw et al., 2000; Fong et al., 2006; Bell et al.,

2010). However, people still have a positive attitude towards that behaviour. Some might argue that this attitude is due to the addictive nature of smoking, yet other examples can be seen with regard to drinking alcohol, speeding, fast food, etc. There is enough evidence to argue that both factors are linked, but distinct.

The Relationship Between PBC and Knowledge

A Spearman's rank-order correlation was run to assess the relationship between PBC and knowledge using Phase 1 survey data. One hundred and eighty-eight participants were included. Preliminary analysis showed the relationship to be positive (see Figure 5.6).
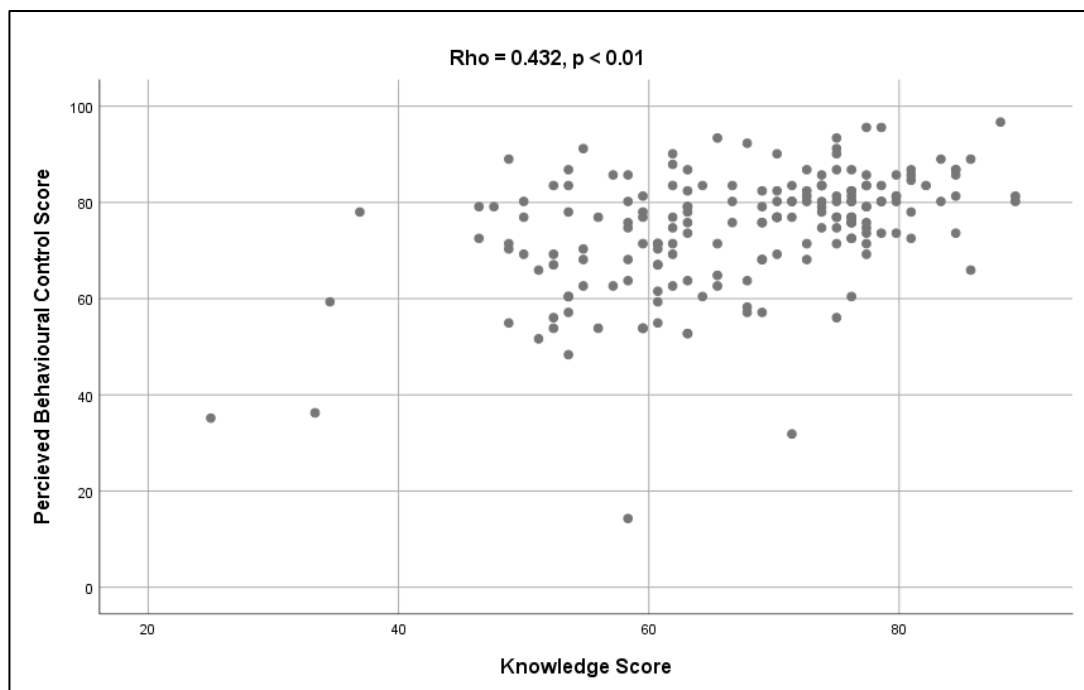
Figure 5.6 The preliminary relationship between PBC and knowledge illustrated by scatterplot

Further testing concluded that there was a statistically significant, moderate positive correlation between PBC and knowledge (Rho = 0.432, $p < 0.01$). Table 5.6 summarises the result of the test.

Table 5.6 Results of the Spearman's rank correlation coefficient between PBC and knowledge

	PBC	Knowledge

Spearman's rho	PBC	Correlation Coefficient (Rho)	1.000	0.432**
		Sig. (2-tailed)	.	< 0.01
		N	195	188
	Knowledge	Correlation Coefficient	0.432**	1.000
		Sig. (2-tailed)	< 0.01	.
		N	188	192
**. Correlation is significant at the 0.01 level (2-tailed).				

A possible reason for the relationship between PBC and knowledge can be interpreted by examining the factors broadly. PBC can be how much confidence we have in our ability to perform a behaviour, if we possess the requisite knowledge and skills, then it is reasonable to assume that our PBC will also be high and vice versa.

Summary of Spearman's Correlation Tests

The use of Spearman's correlation demonstrates that a number of factors are linked and that these relationships can be impactful. The concept of relationships demonstrates the complexity involved with isolating components of the framework as well as the interconnectedness of factors. It is vital that consideration of possible relationships between factors is given in the design of behavioural interventions. Without this consideration, the efficacy of an intervention may be reduced. The attitude–behaviour gap is possibly better understood when we consider the range of factors that could have a similar relationship as seen between social norms and attitude.

5.2.2 Thematic Development of Relationships

This subsection examines the thematic development of relationships using the data collected from Phase 2 and Phase 3. Figure 5.7 illustrates the development of themes and topics that emerged from Phase 2 and Phase 3 interviews.
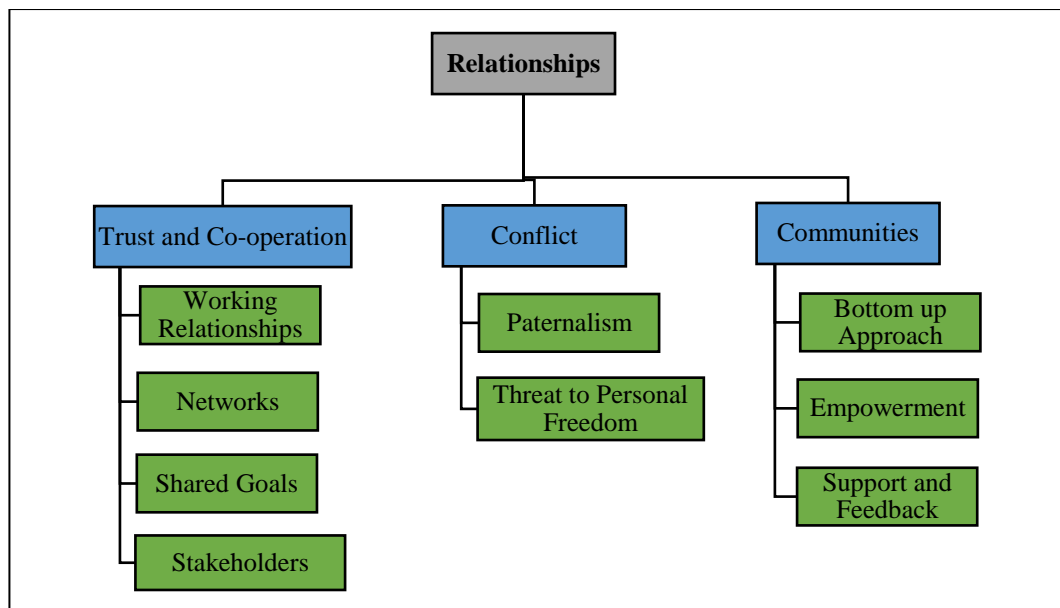
Figure 5.7 Thematic development of relationships displaying prominent subthemes

Trust and Co-operation

Trust, which is an internal factor, can have a significant impact on the relationships involved with outdoor recreation and activity tourism. TRE07 identified relationships as one of the main contributors to their organisation's success, stating that they feel more influential in the development of outdoor recreation due to "developing a very good working relationship with all the different stakeholder groups". This theme was expounded upon by a number of experts both in Phase 2 and 3, for instance, TRE03 identified a new project being carried out in the mountainous areas around Ireland in which the local community is directly involved in the identification of relevant stakeholders. The building of working relationships at the start of a project has been cited in the literature as being important in building trust (Imran, Alam and Beaumont, 2014; Liu et al., 2014; Wishitemi et al., 2015). A compelling point regarding the value of relationships was made by TRE06, who highlighted the value of working with other organisations towards a shared goal. TRE06 explained that by including numerous partners in their projects, they have

been more effective in the delivery of their interventions.

Conflict

The topic of a person's relationship with authority was discussed with the experts in both Phase 2 and Phase 3 of the research. A good example of the importance of relationships to behavioural intention can be seen in the United States. BCE08 highlighted the issue that they face with maintaining a positive relationship with recreationists while still protecting the outdoors. A main focus of BCE08's work is the development of interventions that do not infringe on the personal freedom of recreationists. As stated by BCE08, too often, environmental organisations like Leave No Trace (LNT) are regarded as the "fun police". This public perception can severely hamper an intervention. BCE09 noted that they work with communities promoting environmentally responsible behaviour while still "letting them think they have a lot of freedom to make their own decisions". BCE09 argued that relationships need to be built on trust (see Section 4.3.8) as well as clear and effective communication, which is discussed in Section 5.5.

Communities

The interviews with experts indicated that a good relationship with local communities is essential for the promotion of responsible recreational practices. This was discussed in the literature review, particularly in relation to the development of tourism in developing countries, and it is one of the core principles of sustainable tourism (Campbell, 1999; Kiss, 2004; Tsaur, Lin and Lin, 2006; Stronza and Gordillo, 2008). Studies have shown that without the development of good relationships with local communities, there can be a significant backlash against the development of tourism in these countries. The discussions with the experts

emphasised the importance of relationships and that the use of a paternalistic approach may not be an effective way to engage with outdoor recreationists, especially considering that outdoor recreation is usually associated with freedom and getting away from the stress of everyday life. If an intervention dampens this disconnect and forces recreationists to feel like they are being controlled, then it makes sense that such interventions have been unsuccessful.

As discussed in the literature review as well as in Chapter 4, there exists an attitude–behaviour gap, which examines the disparity between positive environmental attitudes and harmful behaviours. Imposing on outdoor recreationists attempting to relax and disconnect from everyday stress with paternalistic interventions could drive a wedge between the community and the land management officials. However, the building of a relationship with stakeholders which encourages outdoor recreationists to connect with nature may help instil an environmental ethos and make outdoor recreationists more aware of their behaviours in an unobtrusive way. In addition, many of the irresponsible behaviours reported by land management (littering, interference with wildlife, etc.) are addressed by regulations; however, these regulations seem to be ineffective and difficult to enforce. The theme of laws and enforcement is discussed in more detail in the next section.

5.3   Laws and Enforcement

This section examines the thematic development of law and enforcement as components in the framework. As discussed in the literature review, the use of regulation and law has been seen to change behaviour in some cases. However, the use of regulation can be a paternalistic infringement of personal freedoms, as discussed in Section 2.5.1. The theme of regulation, enforcement and direct

management arose amid discussions with several experts in Phase 2 and 3 of this research. Figure 5.8 gives a visual representation of the thematic development of law and enforcement through Phase 2 and Phase 3 interviews, which is discussed in this section. The opinions of experts on the concept of law and enforcement led to the development of subthemes such as punishment, paternalism, the importance of freedom, and the implementation of interventions.
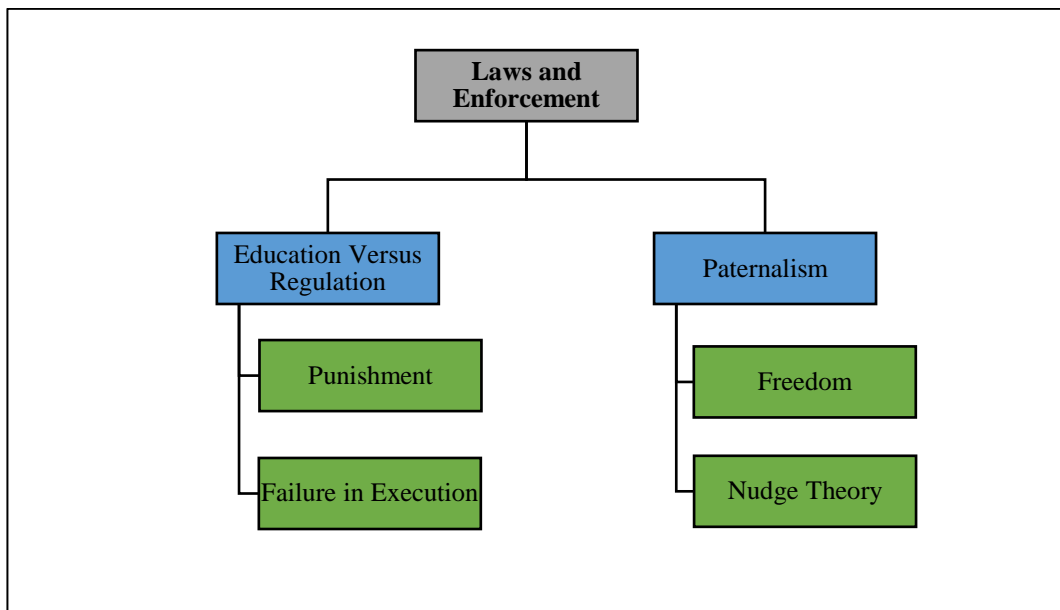
Figure 5.8 Thematic development of laws and enforcement displaying prominent subthemes

Table 5.7 gives a brief introduction to the various viewpoints expressed by the experts. One of the key issues that BCE14 focused on is the disparity between legislation and people's perception of acceptable behaviour. In particular, BCE14 expressed annoyance that a person's perception of their dog's behaviour would result in the ignoring of legislation, especially with dogs on the dangerous dog's list. BCE14 identified the serious issue of communicating the message that "it doesn't matter what you believe if you have a dog on the dangerous dog list, it must be kept under control by law".

Table 5.7 Law and enforcement thematic development with examples from Phase 2 and Phase 3 experts

Direct Management: Contrasting Viewpoints on the Effectiveness of Regulation and Direct Management Approaches in Behavioural Change
"When you have rules and regulations, and you dictate to people, you are on a loser there" TRE05 "At face value, I think direct management, limiting the use or cutting people off in use or fining people it seems to be the most effective, but it is not a reality" BCE09 (when asked what the best means is to change behaviour with unlimited resources) "There are simple things could be banned that we all thought would already be in place, like pickups or levies on the coffee cups and that didn't come through" BCE10 "If people see us as the fun police or the hiking police then support for us dwindles" BCE08

A new approach suggested by BCE14 would be to introduce the concept of zoning in relation to dog walking, which has been adopted in cities like Barcelona. BCE14 contended that the zoning would be designed in a similar fashion to traffic lights: the "green zones mean that your dog can be off lead, the red zones mean that your dog absolutely has to be on a lead or not in that area at all and amber means a dog must be under effectual control". BCE14 argued that the efforts in the past to increase compliance with regulations pertaining to dogs have been ineffectual for a number of reasons. BCE14 is now approaching the situation in such a way as to include the relevant authorities while also contacting local community groups and land management officials. By building this new approach with an emphasis on landowners, recreationists and officials, they hope to design and develop effectual dog owner education in Ireland. BCE14 had adopted a multi-tiered approach to the issue by supplementing the educational material with a localised event in which relevant stakeholders can meet and discuss an issue. This method of inclusion and building of relationships may prove more useful than the creation of signage alone (Vorkinn, 1998; Skår and Vistad, 2013).

5.3.1 Education Versus Regulation

Despite the support for the use of educational methods to induce behavioural change, several respondents discussed the need for more involvement from governments and land management officials. This suggests that while respondents are keen to promote education, the use of regulation and co-operation with management officials is also regarded as an important factor in the successful design and delivery of interventions. One example of this is the smoking ban in Ireland. The smoking ban was discussed in the literature review and is an example of a nationwide intervention using regulation (see Section 2.8.1). BCE08 argued that the smoking ban and also the plastic bag levy serve as examples of how direct management approaches can be successful, and BCE10 used the smoking ban to justify the creation of more bans and levies in other areas such as plastic bottles. However, the smoking ban was not a nudge, it was not an educational program, and it was not designed to empower individuals. So why was the ban used as an example of a successful behavioural intervention by experts who believe education and empowerment are the best means to induce long-term behavioural change? The answer to this may come from the disaggregation of these subthemes.

Using the data which emerged from the interviews in both Phase 2 and Phase 3, and by consultation with the literature review, an argument could be made for the utilisation of both regulation and education in the design of behavioural change interventions (Welford and Ytterhus, 2004; Cárdenas-Torres, Enríquez-Andrade and Rodríguez-Dowdell, 2007). Interventions tailored towards the development of outdoor recreation should aim to not only educate recreationists and raise awareness but should endeavour to explain the necessity of such regulations. This point is stated

by a number of experts throughout the interview process, including TRE04 as seen in Section 4.3.1: "People are sensible. If you explain something in a coherent and in a positive way, people are, in my opinion, happy to oblige". Recent research from the United States examined the effectiveness of combining direct and indirect management strategies in order to reduce undesignated trail usage in a national park (Schwartz et al., 2018). The research suggests that a multi-faceted approach using a combination of direct and indirect approaches can achieve greater influence on behaviour when compared to individual management strategies.

5.3.2 Paternalism

As suggested in the literature review, paternalistic infringement can result in significant pushback (see Section 2.5.1). An aversion to using a top-down approach to induce behavioural change was a theme in interviews with a number of experts. Figure 5.9 illustrates how paternalism emerged as an important sub-theme during the analysis and coding of expert interviews. In addition, several experts discussed the use of nudging people towards desired behaviours and the importance of maintaining individual freedoms in participants.

It became evident throughout the interviews that there was an aversion to appearing paternalistic in the design of behavioural change interventions. Experts, for the most part, rallied to the promotion of education and empowerment as the most effective means to induce behavioural change. BCE10 described the need for education rather than direct management in their interview, saying if they "don't tell the 'why' then we are just going to create more problems as humans. I strongly believe that we need education, not just for this problem but for more problems to come".
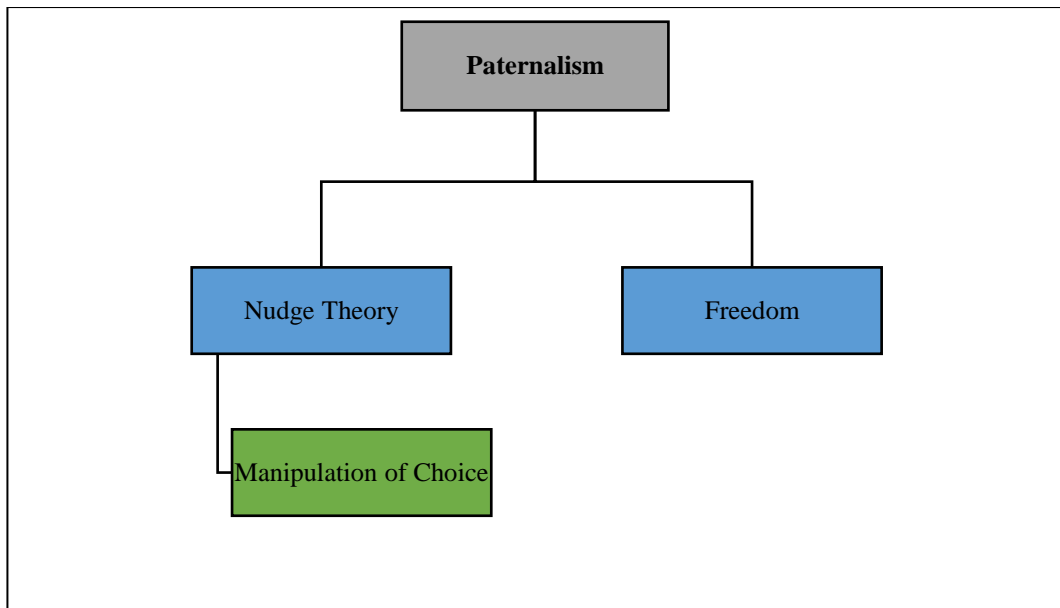
Figure 5.9 Thematic development of paternalism displaying prominent subthemes

There seems to be a reluctance amongst some of the experts to acknowledge the use of direct management. However, most respondents, in one form or another, stated the need for co-operation with state bodies or management officials in the design of future interventions. Perhaps direct management is an unappealing concept for behavioural change experts to admit using, but, at the basic level, they are attempting to manipulate the population to adhere to their perception of desired behaviours. Shortly after BCE10 advocated the importance of education and to keep people environmentally engaged, they indicated a need "to introduce other bans and levies in order to have that wider impact". BCE09 made an interesting point regarding this topic: when asked what the most effective way would be to change behaviour (providing that resources had no limit), BCE09 indicated that a direct management approach with enforcement would be the most effective. In addition, as discussed, BCE14 raised the issue of zoning; however, the implementation of zoning would not be possible without some form of interference from land management. Initial interference would be needed to install and promote the zones. In addition,

monitoring and enforcement would be needed to ensure compliance with new zoning restrictions.

The use of nudge theory was discussed by a number of interviewees. Both BCE08 and BCE10 emphasised the use of nudging people into making the right decision. BCE08 advocated using nudges in order to change behaviour in such a way as to avoid "dropping the hammer", which, to them, separated using nudges from direct management. When discussing behavioural change with experts from Phase 2, TRE03 and TRE04, both of whom work for governmental bodies, advocated the use of education to induce behavioural change in the population. The evidence suggests that regulation needs a significant investment in enforcement in order to be effective (Sorice, Flamm and McDonald, 2007; Overvåg, Skjeggedal and Sandström, 2016).

This thought is echoed in several interviews, as experts in both Phase 2 and Phase 3 highlighted the intensive workload and cost that the enforcement of regulations would require. BCE09 highlighted that this would be nearly impossible due to the varied nature of outdoor recreation. Instead, an indirect approach is better suited to the task of behavioural change. This point is echoed in the literature review when considering Ireland. For example, most funding that goes to outdoor recreational areas (for example, National Parks, Special Protection Areas and Special Areas of Conservation) comes from the government. These limited funds make it difficult to enforce a regulation in locations that can be large (Pigram and Jenkins, 2005; Manning, 2007; Manning and Anderson, 2012).

5.4   Access and Facilities

In discussions with experts in both Phase 2 and Phase 3, the themes of access to and

the availability of facilities were examined in regard to outdoor recreation. Access and facilities were not explicitly mentioned as a key component to behavioural change. However, issues with both of these subthemes arose in the implementation of previous interventions by experts. For example, BCE09 developed an intervention which aimed to limit access to a recreational area in order to reduce crowding in addition to promoting less frequently used areas.
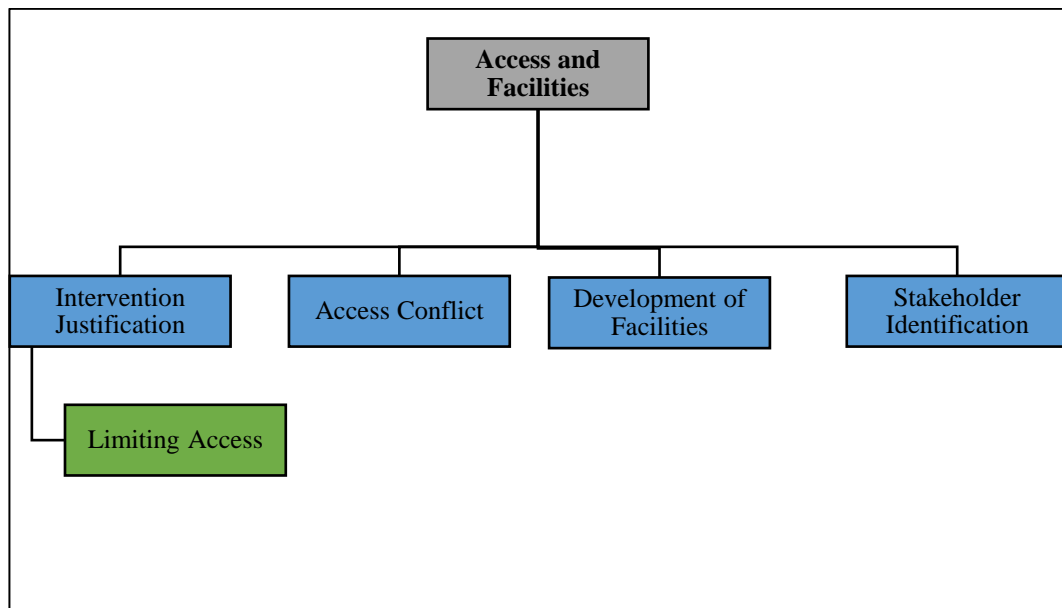
Figure 5.10 Thematic development of access and facilities displaying prominent subthemes

Figure 5.10 illustrates the themes emerging from the expert interviews in regard to access and facilities. A number of experts felt that many conflicts in regard to outdoor recreation arose from issues relating to these themes. These themes will each be dealt with in the following subsections. In addition, a number of interventions have been tested in the past that revolve around the procurement or promotion of new facilities in recreational areas.

5.4.1 Access as a Justification for Behavioural Interventions

As discussed in the literature review (see Section 2.4.2), over 80% of land is privately

owned in Ireland. Access to natural resources for outdoor recreation is entirely at the discretion of the owner (Comhairle Na Tuaithe, 2006), and the relationship between outdoor recreationists and landowners continues to deteriorate (van Rensburg, Doherty and Murray, 2006; Madden, 2009). In addition, a large number of areas in which recreation takes place occur in Special Areas of Conservation or Special Protection Areas, which means that these areas are designated for the conservation of protected species of plants and animals (Stokes, O'Neill and McDonald, 2004; van Rensburg, Doherty and Murray, 2006; The National Trails Office, 2012). This not only highlights the importance of the sustainable development of outdoor recreation and activity tourism but also illustrates a number of factors for consideration.

One of the main factors is the deterioration of legally protected areas by heavy visitation and irresponsible behaviour, which remains an area of tension between conservationists and tourism and recreation developers. However, the development of tourism and recreation brings money into surrounding areas, and some researchers suggest that it can provide support for the protection of fragile ecosystems (Lee, 2013; Imran, Alam and Beaumont, 2014). One of the main barriers to the development of activity tourism and outdoor recreation has been the transparent dissemination of revenue in the local community as well as co-operation among stakeholders, which this research has shown to be critically important. In a discussion of this theme, TRE06 noted how access had become a significant issue that they address in their organisation. From interviews, it seems that access is usually combined with other impacts such as littering, dog fouling and erosion.

TRE07 described access issues with different types of recreationists as a significant

problem. TRE07 discussed an intervention to reduce the different types of recreationist using the same access point to the area. They described how by getting the relevant parties to agree on specific access routes, the number of informal routes was reduced. With the decline of informal access routes, a reduction in conflict between recreationists and landowners was seen.

Building on this topic, several interesting points were made by behavioural change experts in Phase 3 in relation to access. BCE09, who works in the United States, described the issue they encountered when an intervention attempted to limit access to a recreational area. This intervention attempted to encourage recreationists to use other parking and access facilities in order to allow much-needed maintenance to occur. BCE09 explained that due to the restrictive nature of the intervention, many regular visitors to the area voiced their displeasure, indicating a strong sense of impediment on their right to access the area, which echoes the issues of paternalism and the perspective of freedom which was discussed in Section 5.3.2. This suggests the importance of considering access in the design of behavioural interventions. The relationships between the external factors, such as access, had a strong influence on the internal factors of the participants, and BCE09 described the issue as people assuming "that we were limiting their access to what they do on a daily basis".

5.4.2 Access Conflict

Although conflict has been mentioned in earlier sections, discussions with experts justify its inclusion in this section as one of the main issues relating to access is conflict, either between recreational groups or between recreationists and landowners. Section 4.3.7 mentioned the issue of access conflict and its strain on the relationships between recreationists and landowners, which could have far-reaching

consequences in relation to behavioural change as a breakdown in trust makes finding an amenable solution difficult (Mann and Leahy, 2010; Haukeland, 2011; Hynes, Norton and Corless, 2014). In addition, when discussing access, TRE04 suggested that in many areas across Ireland, particularly in urban areas, "there is a real shortage of places where people, families, can go cycle off-road or go for a good walk". TRE04 described how they are working to address this issue; however, access to outdoor recreation and developed infrastructure is still lacking in areas across Ireland. BCE08 summarised the issue of access conflict by saying that "people are just sharing a finite space" so conflict over access is an inevitability unless the issue is addressed.

Table 5.8 Access and conflict thematic development with examples from Phase 2 experts

Access conflict: Opinions of Experts from Phase 2
"Access to open, accessible infrastructure is still lacking in Ireland" TRE04
"We are largely recreating in an unmanaged situation using informal access, and with ever-increasing numbers of recreational users, we're at risk of putting a strain on the goodwill that we rely upon" TRE01
"The strain then emerges as an access problem, you then see a no entry sign" TRE01
"Erosion and access come into play with the increase in people visiting the areas" TRE07
"We would get huge volumes of people on the weekend which can cause a lot of conflict and congestion" TRE07

Table 5.8 shows a number of quotes from experts in Phase 2. The experts were discussing some of the major environmental issues that they face in their organisation. Several experts interviewed in Phase 2 of the research identified access and facilities as a major component of their work. TRE01 discussed the issue of litter at mountaineering access points; although recreation can occur over a vast area, access to recreation can bottleneck people and result in issues such as crowding and litter. The growing popularity of outdoor recreation means that there is a rise of people using informal access routes in order to avoid delay. This creates conflict

between landowners as well as different recreational users (Pigram and Jenkins, 2005; Ryan, 2003; van Rensburg, Doherty and Murray, 2006). TRE06 expounded upon this thread by describing the efforts made by their organisation to mitigate the issues relating to access conflict. Both TRE06 and BCE13 confirmed that communication with landowners and the development of greenways for recreation are significant concerns for the development of outdoor recreation and tourism.

A fascinating comparison can be seen with BCE13. BCE13 primarily works in New Zealand, where access to outdoor recreation is vastly different when compared to the United States or Ireland. BCE13 described "freedom camping" in New Zealand, which has been a long-standing tradition. This allows recreationists to have significant liberties in choosing camping locations in the countryside. BCE13 claimed that freedom camping has recently been challenged in the courts due to the increase in impacts connected to the growth of recreation and tourism in New Zealand. BCE13 noted that in both Ireland and New Zealand, a large portion of recreation occurs on private or protected lands.

In addition, BCE13 described the creation of the Walking Access Commission in New Zealand, which identified that people's right to access recreational land is being restricted by certain farmers. In order to allow access to recreation, the Walking Access Commission "works with farmers and the Department of Conservation, in order to show people where they can access recreation areas and to ensure that farmers are following the law in that regard". By identifying access as an issue, the Walking Access Commission had designed an intervention to increase compliance with recreational practises by visitors while at the same time protecting the livelihood of landowners. In Ireland, we have a somewhat similar situation with Comhairle Na

Tuaithe, which aims to increase cooperation between stakeholders and provide access to sustainable recreation (Comhairle Na Tuaithe, 2006; van Rensburg, Doherty and Murray, 2006). In addition, under Comhairle Na Tuaithe, several rural recreation officers have been appointed and have been relatively successful over the last few years in addressing this issue as well as developing outdoor recreation throughout Ireland. One of the most extensive programmes is the Walk Scheme, which began in 2008, covers 39 trails and involves 1,900 landowners.

5.4.3 Development of Facilities

Access and facilities can be a complicated concept to discuss as there is debate among land management stakeholders on whether the increased provision of bins/recycling facilities would have an impact on the levels of littering in recreational areas (Bell, 2005; Pietilä and Kangas, 2015; Schmitz and Tsobgou, 2016). TRE06 described how the increase in bins adds to the maintenance cost of already under-resourced national parks and protected areas. Environmental education groups such as Leave No Trace advocate that recreationists take their rubbish home with them in their "pack it in, pack it out" slogans.

Several experts in Phase 2 advocated for the encouragement of recreationists to plan ahead and bring all that they might require on a trip in case of a lack of facilities. TRE02 discussed the reluctance of tourism and commercial recreational providers to advocate responsible behaviours in the outdoors. In particular, TRE02 argued that many businesses have the preconception that advocating environmentally responsible behaviour may alienate recreationists and lead them to be considered the "fun police", which was mentioned earlier in Section 5.3. Again, this highlights the interconnectedness of factors that can influence behavioural intentions at any time,

both internal and external.
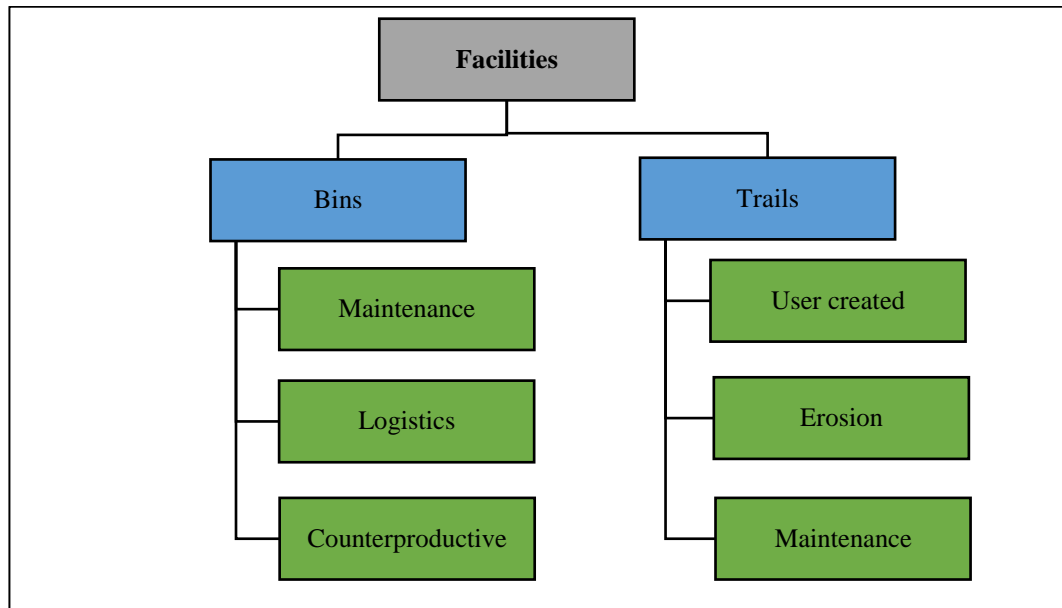
Figure 5.11 Thematic development of facilities displaying prominent subthemes

The concept of increasing the facilities has been discussed by behavioural change experts. BCE11 argued that the lack of bins had affected their own enjoyment in the outdoors: "when I went there, there wasn't one bin, nor is there one water fountain". This lack of facilities had forced BCE11 to purchase bottled water. BCE11 made a point that "good intentions will only take you so far" in regard to facilities and that facilities such as bins were necessary. The opinions of BCE11 were not shared by other experts, who feel that the provision of bins and other facilities will only allow for the accumulation of rubbish in a localised area, which in turn generates issues relating to maintenance and disposal of waste as well as attracting scavenging pests and birds. BCE14 pointed out that the introduction of specific dog fouling bins can involve permit and processing issues due to health and safety concerns. In addition, the placement and maintenance of the bins can be an issue as recreation can take place over a large area. The reluctance to provide bins is surprising, considering that BCE14 previously discussed the idea of zoning and direct management strategies to

curtail irresponsible dog recreation. The opposition to the provision of facilities demonstrates that reliance on direct management strategies is not seen as optimal by behavioural change experts.

The provision of bins is not the only matter relating to facilities that was discussed by experts in Phase 2 and Phase 3. Trail erosion and the maintenance and development of established trails was an interesting subtheme of facilities. TRE01 noted that in upland areas, trail erosion and, by extension, habitat disturbance had become a serious issue. TRE03 expressed concern that the attempts made to meet the demand for recreational trails has caused the building of trails that are unsustainable. TRE03 gave the example of bog boarding, which is the construction of raised wooden trails in protected bog lands. TRE03 noted that the use of timber was recommended in the past as bog boarding would reduce environmental impact in these areas as it would reduce footfall on protected bogs. Initially, the timber used consisted of basic wooden sleepers; however, TRE03 pointed out that, "because of the environmental impact of the sleepers as a result of leaching", they no longer use those particular sleepers. TRE03 stated that they now use a treated timber to construct bog trails. However, TRE03 described an alternative in the design of bog trails. Instead of bog boarding, TRE03 posited that with proper water control and the use of flagstones, a good trail can be established even on soft ground. TRE03 described how this method of bog trail construction seems to be working better in their area as, despite being treated, wooden beams will eventually rot and need replacing, whereas flagstones require less maintenance. This demonstrates that interventions such as the construction of trails can be costly endeavours, particularly if the recommendations turn out to be unsuitable. Furthermore, direct management such as trail construction, can add a level of permanence to interventions which can be difficult to retract and

can actually damage the environment it was implemented to protect.

The previous themes regarding trail use were echoed in the experiences of TRE01, who believed that a recreationist will act in whatever way makes them feel safer: "Coming down the hill on a wet, muddy path, people will put their safety first". This thought illustrates the relationships between factors of knowledge, skill and perceived behavioural control described in Chapter 4 and Section 5.2.1. This demonstrates the multifaceted complexity that land managers face in the sustainable development of outdoor recreation and tourism.

Both facilities and access are important in the design of behavioural interventions, although they may not appear to be the most prominent factors at first glance. The above examples demonstrate that each factor relates to a number of internal and external factors which could influence the success of any behavioural intervention.

5.5   Communication

The presentation of an environmental message has become an important issue for environmental agencies (Brown, Ham and Hughes, 2010; Vagias et al., 2014; Ahmad, Noor and Ismail, 2015). The framing of the environmental message can be as important as the message itself. The concept and importance of communication have been mentioned in a number of sections throughout the findings and the literature review. Figure 5.12 illustrates the various subthemes of communication that emerged through discussions with experts in Phase 2 and Phase 3.
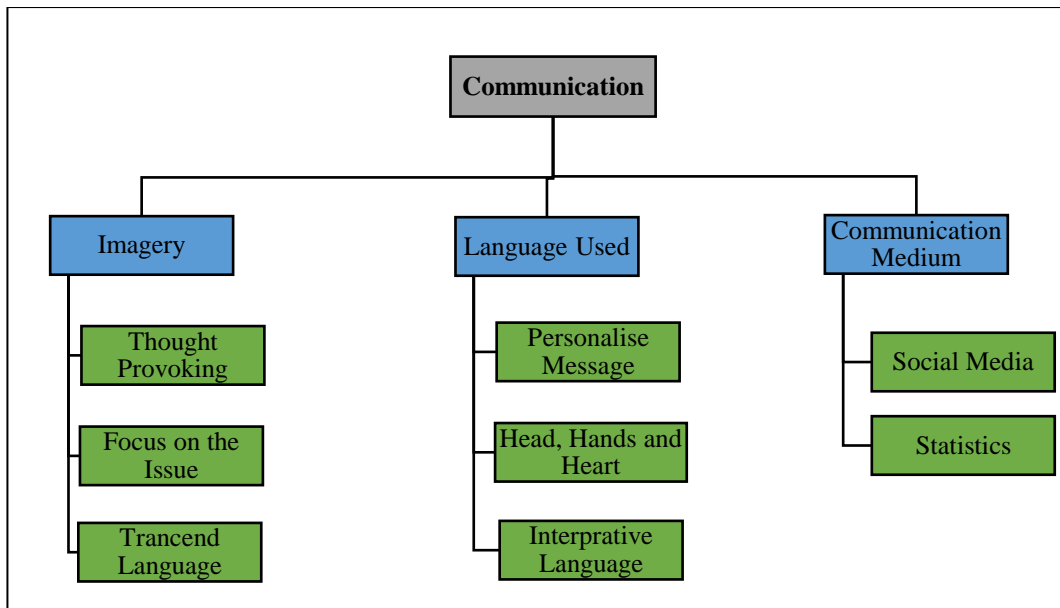
Figure 5.12 Thematic development of communication displaying prominent subthemes

Table 5.9 provides examples of opinions shared by experts in both Phase 2 and Phase 3 in regard to the thematic development of communication. The use of imagery arose as a significant subtheme in the development of communication. Effective communication was a recurrent theme, particularly in the development of signage, from experts in both Phase 2 and Phase 3. Most experts posited that in order to develop behavioural interventions successfully, consideration must be given to how an intervention is presented. A number of experts discussed the use of multiple communication mediums in order to disseminate information to a wider audience.

Table 5.9 Communication thematic development with examples from Phase 2 and Phase 3 experts

Importance of Communication: Opinions of Experts from Phase 2 and Phase 3
"When the message isn't about regulation and instead it appeals to their ethics then people are much more likely to engage with it" TRE05
"Sometimes, there could be a group who do not feel that they are being listened to, and that's where you start to get negative publicity and push back to your projects" TRE07
"If you design a treatment, you need to know what is the most effective language that you can use. Because once the study is launched, you cannot go back" BCE09
"You have to tailor the message because why would someone be interested in something that's not really related to" BCE12

5.5.1 Imagery

The use of imagery is of particular importance to Ireland, as we have seen an increase in visitors from non-English speaking countries in recent years (Fáilte Ireland, 2019)BCE08 argued that the use of imagery and well-founded statistics can be an effective means to overcome some of these challenges. As an example, BCE08 described a campaign that was used by land management officials in the United States that relied on images to describe the problem. By doing so, BCE08 argued that the clear images of the problem made it so "that anyone could identify what is wrong in the area".

In order to protect the environment, it will be necessary to develop and design interventions that transcend language barriers. This idea stems from the belief that a large proportion of negative impacts of outdoor recreation are as a result of careless and uninformed actions of recreationists. On this premise, increasing the level of knowledge and promoting recreation that is responsible will help mitigate the negative impacts.

It is essential to look at these interventions from the perspective of the recreationist, as BCE10 claimed "People have lives, outdoor recreation is a small element of their lives". This highlights the need to be conscious of your target audience. A similar message is echoed in the advice given by BCE10, which was "listen first. Not only does it give the information needed, but it creates trust". The importance of a positive relationship with people was a common theme in BCE10's answers, which stems from an opinion that simply providing information is not enough to induce behavioural change. Instead, building the level of trust with the audience is vitally important and, to do so, requires a level of "honesty". This supports the refrainment

from using intrusive methods such as fines and sanctions, as being too heavy-handed on a small aspect of a person's life might not be the best way of motivating the desired change. In relation to communication and behaviour change, the experts felt that in order to have a meaningful impact, a message has to be personal to each individual. For example, according to BCE12: "You have to tailor the message because why else would someone be interested in something that's not relatable". BCE12 continued along this path by saying interventions "need to have a connection and to get recreationists emotionally involved". This focus of getting an individual to examine their actions is an interesting idea.

5.5.2 Language Used

In Section 5.3.1, a number of points were made in relation to paternalism in communicating interventions. TRE03 referred to the efficacy of negative messaging in that "a lot of the groups would not be happy when they are told 'no'" and how it can hinder the uptake of environmentally responsible behaviours. TRE07 echoed this by explaining the need to increase communication with all relevant stakeholders as there could be a group of people "who do not feel that they are being listened to and that's where you start to get negative publicity and push back to your projects".

There is evidence in the literature on the presentation of signage, and the effectiveness of interpretative messaging (Bechtel and Churchman, 2002; Walkosz et al., 2008; Berns and Simpson, 2009; Lawhon et al., 2013). Research has suggested that using imagery and statistics in the development of signage in recreational areas can increase the visibility of the sign, which, in turn, can increase adherence to recommended practices (Kaiser, 2008; Taff, 2012; Lawhon et al., 2013).

When asked to identify some of the biggest challenges that they face in their organisation, BCE08 was keen to discuss the effect of communication on their ability to induce behavioural change. BCE08 stated that "if people see their efforts as the fun police or the hiking police, the support dwindles". A number of interview participants made a similar comment, for instance, BCE10 indicated that environmental messaging, especially in the media, could be overly negative and counterproductive in the long run: "we do find it a challenge to keep a positive message when we deal with the press, and I think we have been hurt through the years because of it". This is counterintuitive to what some people would imagine the media could do for a cause, and it suggests that focusing on the negatives, which is common in the media, could make people less likely to adhere to responsible practices as they feel there is nothing that they can do.

5.5.3 Communication Medium

While the evidence suggests that a tailored message can increase the effectiveness of signage and other interventions, there are several issues to consider. The first thing to consider is where such signs or communication tools are located. For instance, if an information board asking recreationists to pack their rubbish into plastic bags is placed midway through a trail, how will this affect recreationists who have not brought a bag with them? This raises the question as to where to use interpretative signage and where to focus on an intervention. In the discussion of this theme, BCE08 made several interesting comments regarding the recreation cycle. In the recreation cycle, recreation cannot be seen as a single behaviour. Instead, recreation should be examined as a series of smaller stages that lead to recreation; the stages could be something similar to anticipation, planning, travel until we eventually get

to the engagement with recreation. This opens up a myriad of opportunities in which to promote recreational practices as well as informing recreationists before they come to an outdoor area. This could be of particular interest to Ireland as access to outdoor recreational facilities is not always a clear and easy path. As seen in the literature review, access to outdoor recreation is, for the most part, only possible through the goodwill of local landowners. This can, however, create opportunities to develop and deploy bespoke, tailored messages at possible chokepoints in order to maximise the distribution of messages. By considering the stages of a recreational behaviour and understanding the target audience, the opportunities for promotion of an environmental and responsible recreational ethic is possible.

The need for two-way communication is highlighted in the literature as necessary for the sustainable development of tourism in other countries (Ojedokun and Balogun, 2010; Lee, Jan and Yang, 2013; Wishitemi et al., 2015). The importance of communication and networks in Ireland is of particular interest as explained by TRE02: "Over 80% of the land on the island of Ireland is in private ownership". The trust and goodwill of landowners has come under strain in recent years with the increase in participation of outdoor recreation, and behavioural change interventions will have to implement communication strategies to accommodate groups and to develop these networks (Madden, 2009; Ní Dhubháin et al., 2009).

Communication, networks and communities were common themes discussed by expert interviewees as valuable resources for the sustainable development of tourism. TRE01 indicated that the promotion of environmental awareness could not rely on printed promotions solely. Instead, using "networks, through education and awareness" and as well as communication methods as the "vehicle for the good

practice message" has become standard practice for environmental agencies.

The impact of social media on outdoor recreation was an interesting subtheme that arose out of discussions with experts from Phase 3. BCE08 posited that the popularity of social media sites such as Facebook, Pinterest and Instagram have had a significant influence on how people take part in outdoor recreation on shared public lands. As stated by BCE08: "people are posting videos and photos of these wonderful places as well as geo-tagged locations". However, this can result in environmental issues as "you get throngs of people heading to singular locations which, before social media, were completely unknown". This can lead to a lot of issues as these previously less well-known areas might not have been habituated to overuse when compared to the more popular areas. Several experts also describe how social media can act as a suitable medium to spread environmental messages, particularly with the use of evocative images and video.

BCE10 described how they have developed a series of short videos for use on social media in order to raise awareness of their programs. In addition, BCE10 pointed out how social media, when used correctly, can be a powerful tool to inspire people to act. An example supplied by BCE10 was the beach cleaning campaign on Brittas Bay in Co. Wicklow. During the heatwave of 2018, more and more people were visiting the beaches. The damage done to Brittas Bay got national attention due to a video showing the extent of the damage caused by poor recreational behaviours. BCE10 described how "the clean coast group, who had been inactive in the area for a number of years, was revitalised and got new members". The evidence from experts suggests that social media could be an avenue on which future behavioural interventions could be based.

An interesting point comes from a recent study that was able to record usage data on small urban green spaces using geo-tagging (Zhang and Zhou, 2018). This might aid in estimating the usage numbers of recreational areas in Ireland in future studies.

5.6 Culture

Culture is the last external factor mentioned in the preliminary framework. The influence of culture is well established throughout the literature across numerous disciplines (Wang, Bickle and Harrill, 2010; Richards and Munsters, 2010; Sayan et al., 2013). A case could be made that culture is encapsulated in the confines of social norms and perceived behavioural control as described in the theory of planned behaviour. This research, however, would argue that in order to successfully design interventions in the context of outdoor recreation, culture should be incorporated into the framework on its own. One of the main reasons for doing so is due to the relationships between culture with a number of internal and external factors.
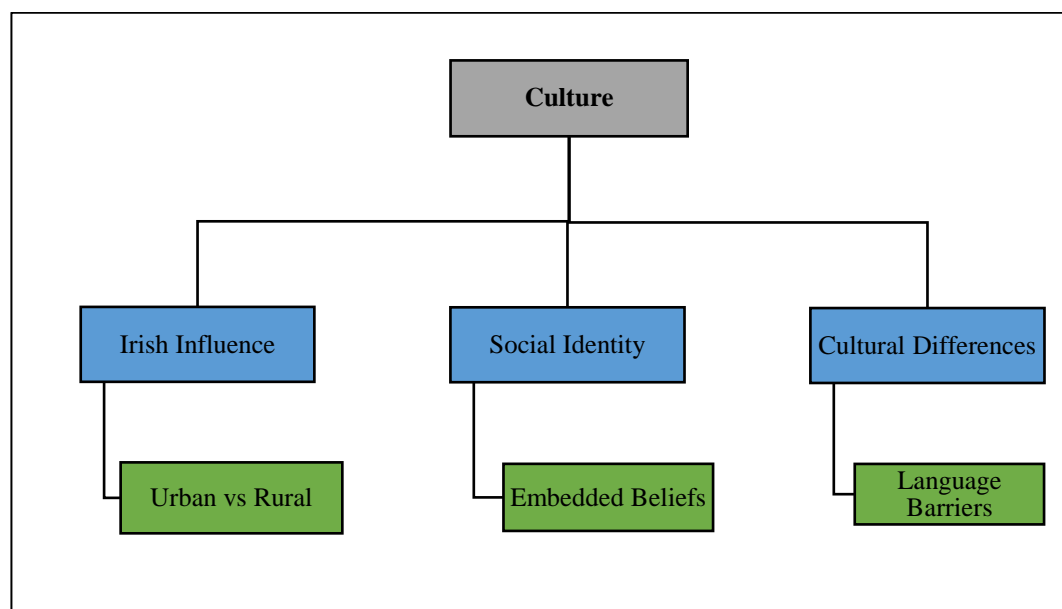
Figure 5.13 Thematic development of culture displaying prominent subthemes

As described in the previous section, BCE08 posited that the use of imagery had

allowed their interventions to cross language and cultural boundaries. Figure 5.13 illustrates the themes and subthemes which emerged during expert interviews.

5.6.1 Irish Cultural Influence on Behaviour

BCE11 advocated that social identities can be deeply rooted in the culture in which a person lives. Community groups develop cultures and norms that increase the pressure to conform to social norms. The fascinating thing to understand about culture is how it evolves with time. For instance, Ireland has held a number of referendums in recent years that highlight the cultural shift and the decline of the Catholic Church's influence (for example, on gay marriage and abortion). These referendums illustrate that as time moves forward, the perception of what is acceptable behaviour can change. In order to design a behavioural change intervention, a working appreciation of the culture in the target area is essential. As BCE11 pointed out, in the past people have killed and died to maintain their cultural identity. Building on this point, BCE08 believed that behavioural culture is changing rapidly in present times. With the advances of technology, the free exchange of thoughts and ideas, as well as the dissemination of trends, can have a significant influence on the efficacy of interventions. BCE08 developed this point further by describing how interventions designed to resonate with people today may not have the "same effect in five years' time, or six months' time or ten years' time".

TRE02 posited that a cultural facet of Irish people is that Irish people do not like to be "given rules" and regulations. They later compare Ireland to England in that "the English they love rules, they like being told what to do". This is an interesting topic as later in Phase 3, BCE11 posited that Irish people see themselves as very different from English people and that Irish people construct a boundary between our two

cultures. BCE11 believed that the boundary is artificial and that this boundary is created by national and political events. This suggests that behavioural interventions that were designed for UK citizens may be suitable for an Irish context. However, it does raise questions on how a culture is defined. Furthermore, why have cross-cultural differences been seen in the literature before regarding behavioural change and psychology (Pigram and Jenkins, 2005; Steg, Van Den Berg and De Groot, 2013; Serenari, Bosak and Attarian, 2013)?

It could be argued that social identity, as well as social norms, should have been listed as external factors in the creation of the framework. However, by discussing the concept of culture with several experts in both Phase 2 and Phase 3, the division of culture, social norms and social identity is justified. Social norms are seen as the internal perceived pressure to conform to what a person thinks is the most favourable behaviour (Ajzen, 1991), while social identity is the internal belief of who a person is. Here culture can be used to describe the boundaries and environment in which social norms and social identities can be founded.

Culture can be a complicated factor to place as elements of culture can influence a behavioural intention both internally and externally. When culture is made a visible factor on a framework, it makes the relationships between the various other internal and external factors more tangible. This visibility might not be as clear when using a more sophisticated theory and, as such, the applicability of said theory might suffer. This reinforces the complexity of designing a theoretical framework.

The relationships between culture and various internal factors such as attitude and social norms should be investigated in order to design a behavioural intervention. In

addition, due to the influence of culture on social identity and a number of other factors, using interventions conducted in other countries without significant tailoring and appreciation of culture could severely affect their efficacy. Although culture is mentioned in a number of behavioural theories, it is often sequestered within other headings and does not receive the recognition that it should.

5.7 Stakeholders

The importance of identifying stakeholders in the design of behavioural interventions has emerged throughout the findings chapters. The importance of stakeholders as a theme which overlaps with all other themes makes it difficult to segregate and discuss without constant repetition of previously discussed findings. Stakeholders emerged as a significant component in the discussion of several framework factors. Table 5.10 provides examples of the emphasis that experts have placed on working with stakeholders.

Internal factors, as described in Section 4.3, evidenced how environmental attitudes, knowledge, social norms and PBC can show variability across certain demographics such as age, gender and education. Experts have commented on this issue and have identified specific demographic groups that can affect the implementation of interventions. For instance, TRE02 identified that people over 35 have more grounding on environmental issues (see Section 4.3.1). This can aid in the design and delivery of environmental messaging and enable the uptake of environmentally responsible behaviours. This demonstrates that prior knowledge of stakeholder demographics can be an important factor to consider in the design of behavioural interventions.

Table 5.10 Stakeholder thematic development with examples from Phase 2 and Phase 3 experts

The Importance of Working with Stakeholders: Opinions of Experts from Phase 2 and Phase 3
"We worked on a project that involved access issues between recreational users and farmers with conflict between the two groups, we worked on agreed access routes. It was a big thing for us as it involved respect between landowners, ourselves and recreational users" TRE03 "We look for and identify problem areas and to see what can be done and we work with stakeholders" TRE07 "The way we work is to inspire and to push forward the leaders that we come across in the community" BCE08

The identification of relevant stakeholders emerged as an important factor in the building of trust and the development of working relationships. TRE07 posited that in order to find a solution to an issue of access conflict, it was important that relevant stakeholder groups such as walking groups and landowners were involved with the process. BCE08 suggested that one of their main aims is to identify key stakeholders who they can inspire to act as leaders in the local communities and to promote environmentally responsible behaviour. Section 5.2 highlights that the development of relationships with stakeholders can allow for clear communication and the co-creation of interventions that can have a lasting impact. In order to design behavioural interventions, prior knowledge of potential stakeholders, as well as consideration for the relationships between stakeholders and the area is vital. The importance of stakeholder identification was echoed by Kindermann and Gormally, who demonstrated that the perceptions of stakeholders towards environmental issues can be different across cultural boundaries, which can significantly affect the efficacy of interventions without prior knowledge (Kindermann and Gormally, 2013).

Community groups can be important facilitators of behavioural change, as evidenced by the literature and the findings of this research. Complications that can arise from

a failure to identify key stakeholders was discussed by TRE07. This failure to consider key stakeholders can lead to pushback as evidenced in Section 5.5.2. An example of the benefit of stakeholder identification can be seen with Comhairle Na Tuaithe, who develop and build working relationships between relevant stakeholders in order to achieve sustainable and responsible recreation in the countryside (Comhairle Na Tuaithe, 2006).

5.8 The Use of Theory in the Design of Behavioural Interventions

This section examines the use of theory in behavioural interventions. During the literature review, a number of points were made regarding the use of theory in behavioural interventions as well as debates regarding validity and efficacy. A number of experts discussed the importance of theory in the design of behavioural interventions. In addition, the importance of feedback in the evaluation of interventions as well as lessons learned was discussed.

An examination of the comments made by experts supports the use of theory in the design of behavioural interventions. Examples of comments made by experts on the concept of theory in behavioural change as well as the importance of feedback and evaluation are presented in Table 5.11.

Table 5.11 Comments made by experts regarding the use of theory in interventions and the importance of feedback

Thematic Development of Theory: Opinions of Experts from Phase 2 and Phase 3
"The thing about theory which I'm sure you understand is that human behaviour is incredibly complex. And to think that humans are all times rational creatures is completely irrational" BCE08

"I think theory is useful, I've done this in a couple of studies, but generally, I'm not in the practice of theory testing. I think theory is useful to help orient where we head with our questions. I tend to think that no one theory is the catchall" BCE09 |

> "Pretty certain that if I research more, I would be able to put a label on the work that I do. Because I have done some research on learning and teaching and it has resonated with me, and I have said yes, I do that. But I never had a name for it" BCE12
>
> "I even show the prospective trainers' ways in which they can incorporate the theory of planned behaviour in their future lessons and how they designed their workshops" BCE13
>
> "If you explain something in a coherent and in a positive way people are, in my opinion, happy to oblige" TRE04

Figure 5.14 illustrates the themes and subthemes of theory, feedback and evaluation, which emerged during expert interviews in Phase 2 and Phase 3.
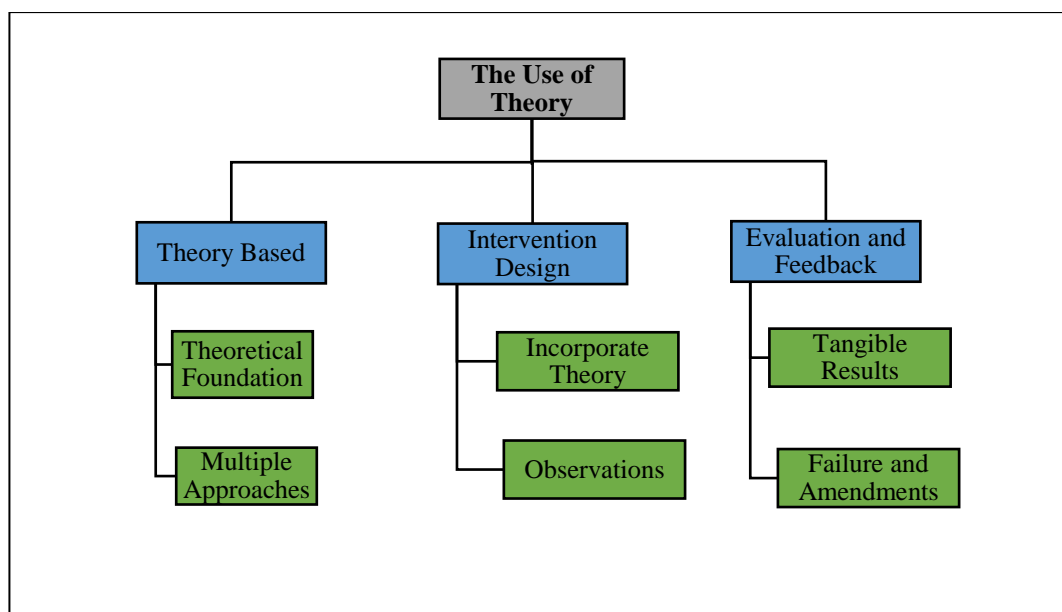
Figure 5.14 Thematic development of the use of theory in behavioural interventions displaying prominent subthemes

5.8.1 Theory-Based Interventions

The importance of theory in behavioural intervention design showed variances between experts. Most respondents felt that behavioural theory, as it is currently seen, is too rigid. BCE09 mentioned that their current and future projects have connections to literature and theory and that using theory as a baseline allows the addition of feedback and experience to enrich the intervention design.

BCE09 seemed to be more in favour of the use of theory. However, BCE08 believed

that although theory can be useful, it was important to acknowledge that "there are usually multiple avenues that can be used and explored and some of the best ideas out there just happen organically". BCE08 further described how a number of their organisation's "best ideas came about because we decided to try something in order to solve a problem". Other experts felt that they are influenced by theory, indicating that nudge theory is useful in their intervention design. The variation in answers with regard to theory was interesting. Some experts felt that their work was influenced by theory yet were unable to identify which one during the interview. The primary behavioural theories that were mentioned were the theory of planned behaviour and nudge theory, which are both discussed in the literature review. This was not surprising as both theories are well known in the field of behavioural change. However, other well-founded theories failed to be mentioned during the interviews. For instance, the transtheoretical model of behavioural change was not mentioned. This is somewhat surprising as accounting for behaviour change over time could be used very productively in the design of behavioural interventions.

5.8.2 Feedback and Evaluation

An important caveat mentioned in the literature review was the evaluation of behavioural theory and interventions and the extent to which a researcher can say that an intervention has been a success. The concept of evaluation and feedback and the inclusion of theory in behavioural interventions was discussed with behavioural change experts. The behavioural change experts believed that feedback to their interventions and projects had for the most part been positive, with BCE13 noting that although interventions have been well received "some people are frustrated because they want to see a much stronger approach". Feedback and evaluation are

an important tool in today's society, with many companies in numerous areas undergoing continuous testing of a product before it is finally released on the market as a product. Looking at behavioural change through this medium, not only is the importance of pilot testing highlighted, but also the need for evaluation and the willingness to adapt to feedback. BCE12, who runs an outdoor education and adventure centre in Ireland, argued that feedback is of great importance to their efforts and that due to the positive feedback to their efforts, they have been able to grow their organisation: "We are open four seasons now, and we get return families all the time".

Positive feedback to an intervention or a product can serve as an indication of what works and what does not, which can be of critical importance to behavioural change in outdoor recreation as monitoring these behaviours is difficult. BCE08 was keen to describe a recently implemented intervention, and, although it was "too soon" to know the effectiveness of the intervention, BCE08 felt that it had "been very well received by people". The possible reason for this could be its focus on language, which was not heavy-handed. Instead, the design was "superscripted and tactfully done". BCE09 complemented this point by saying that although tailoring the message has been found to be successful in the past, they have had "studies where these interventions had no effect". While both BCE09 and BCE08 hailed from a more academic background as regards outdoor recreation and behavioural change, it could be inferred that academic study, as well as the publication of research in this field, demonstrate the efficacy of their work. New knowledge can be used to adapt and refine strategies in the future, and this cannot be discounted.

Conversely, BCE10 was able to evaluate their efforts with more tangible results.

According to BCE10, their efforts resulted in the removal of approximately "700 tonnes of plastic and marine litter from the Irish coastline", and they believe that the removal has "definitely made an impact and is easy to showcase".

Both methods of evaluation have advantages and disadvantages. The academic path can be viewed, evaluated and replicated, whereas the practical path has a visible result that can be seen. If there is to be a gold standard, a combination of evaluation techniques should be used if possible. This could include practical use of theory or a theoretical framework with a clear methodology that will allow for an academic evaluation in conjunction with practical visibility. In addition, it will allow for the replication and evolution of the framework. While much research can indeed focus on theoretical components, efforts to predict and change behaviour need to be tested in a practical setting.

BCE09 argued an interesting point which was that with each study they "are finding something new", the implication being that human behaviour is a constantly evolving process, and continuous study needs to be conducted. In essence, each study has the opportunity to reveal new information; the lessons we learn from the studies are all relevant and may have some use for the future. BCE09 further described how, in a recent study, recreationists were observed and surveyed. However, no intervention was used. This study was conducted to examine reported behaviour versus observed behaviour. The results of the research suggested that "what people are doing is different than what they are reporting". The issue with self-reported studies on behaviour is not a new concept in behavioural research, yet it does make an interesting point. Are people aware of their actions, or do they fear being regarded as irresponsible (Vagias, 2009; Lavelle and Fahy, 2016; Lauren et al., 2016)?

In relation to the topic of feedback, the literature review provided evidence that the poor execution of the eco-tourism initiatives led to a backlash from the local communities, these initiatives stemmed from operational and cultural problems that had not been predicted (Horton, 2009; Youdelis, 2013; Das and Chatterjee, 2015). Examples like this, coupled with the insights gleaned from the interviews, emphasise the importance of understanding the target audience. Without this prior knowledge and communication with the intended recipients, a proposed intervention could face many unforeseen challenges.

The inclusion of legislation into the topic of behavioural change is to deal with the fact that some behaviours are outside the reasonable purview of environmental educators. As BCE08 mentioned, the central behavioural interventions "are aimed at tackling the unskilled, uninformed and careless behaviours", some behaviours, like malicious or illegal actions, cannot be significantly altered with behavioural interventions. BCE09 further built on this point by discussing the direct management approach to behavioural change. BCE09 felt that direct management, such as limiting the use or introducing fines, "seems to be the most effective strategy, but it is not a reality". This is due to the simple fact that enforcement would be impossible over such a geographically diverse system.

5.9   Chapter Summary

This chapter focused on the dissemination of results that tested the external factors of the proposed framework. Several additional factors were discussed in relation to their inclusion in the framework.

Relationships have been an integral part of this research. Relationships can come in

a variety of forms, and this research examines the relationships between internal and external factors in the framework. Much of the discussion throughout the findings chapters has involved relationships in one form or another. For instance, the importance of communication and cooperation with local communities or the role of social identity in the expression of attitude. The examination of external factors seen in this chapter allows for a more comprehensive view of the preliminary framework when combined with the findings of Chapter 4. The interrelationships that are evident in the framework add versatility that may be lost when using a behavioural theory.

The section on regulation and education shows that the use of laws, while necessary, are almost impossible to enforce in the outdoors unless, such as with the smoking ban example from Ireland, an environmental ethic and sense of ownership are instilled in the public. If recreationists feel empowered enough to protect the resource, then they might police an area in the place of authorities. This might result in other problems, such as inter-recreationist conflict; therefore, efforts will need to be made in relation to encouraging effective communication strategies. The use of education or regulation separately in the design of behavioural interventions appears to be an inefficient means to change behaviour.

Access to recreation will also need to be incorporated into the design of behavioural interventions. Without co-operation from important stakeholders, any intervention or development could face push-back or non-compliance.

The importance of communication cannot be overstated. Communication can influence a variety of other factors, both internal and external, as was visible throughout both Chapters 4 and 5. Effective communication and tailoring of a

message to suit the target audience is vital to the success of a behavioural intervention. Through communication, experts in both Phase 2 and Phase 3 of the research were able to show the importance of theory and feedback to the design of behavioural interventions. Behavioural theories have been shown to be important starting points in the design of behavioural interventions, yet it was mentioned that dogmatic reliance on theory could lead to problems with intervention design. Constant testing, evaluation and evolution are necessary for the successful development and longevity of a theoretical framework.

Chapter 6: Framework Testing and Evaluation

6.1 Introduction

If we are to align this research to the pragmatic paradigm, which can be simply summarised as "a statement is true if it works" (Seale, 2012, p.20), then we are tasked with testing the efficacy of the framework. A significant criticism and reason for contention in the field of behavioural change has always been the evaluation of the efficacy of models. Even one of the most renowned behavioural theories — the theory of planned behaviour — has come under criticism in this regard (Armitage and Conner, 2001; Sheeran, Trafimow and Armitage, 2003; Kraft et al., 2005). The framework, which was developed based on the results of this research, was tested using the methods described in Section 3.8; however, in order to improve clarity and for the convenience of the reader, a summary of methods used and justifications are also included in this chapter. The design and delivery of the intervention are briefly discussed, and the intervention is analysed and evaluated.

6.2 The Framework for Behavioural Change

The preliminary framework shown in Figure 2.6 was created based on a review of the literature and was tested using the methods described in Chapter 3. Figure 6.1 depicts the theoretical framework that includes the factors necessary to induce environmentally responsible behaviour in outdoor recreationists.

Internal and external factors which were identified as motivators of behavioural intention in the literature review proved to be important throughout the findings chapters. Although these factors may be mentioned as subsidiaries to core factors in more established behavioural theories such as the theory of planned behaviour, the

analysis of the data highlights the influential role that these elements can have on behavioural intention.
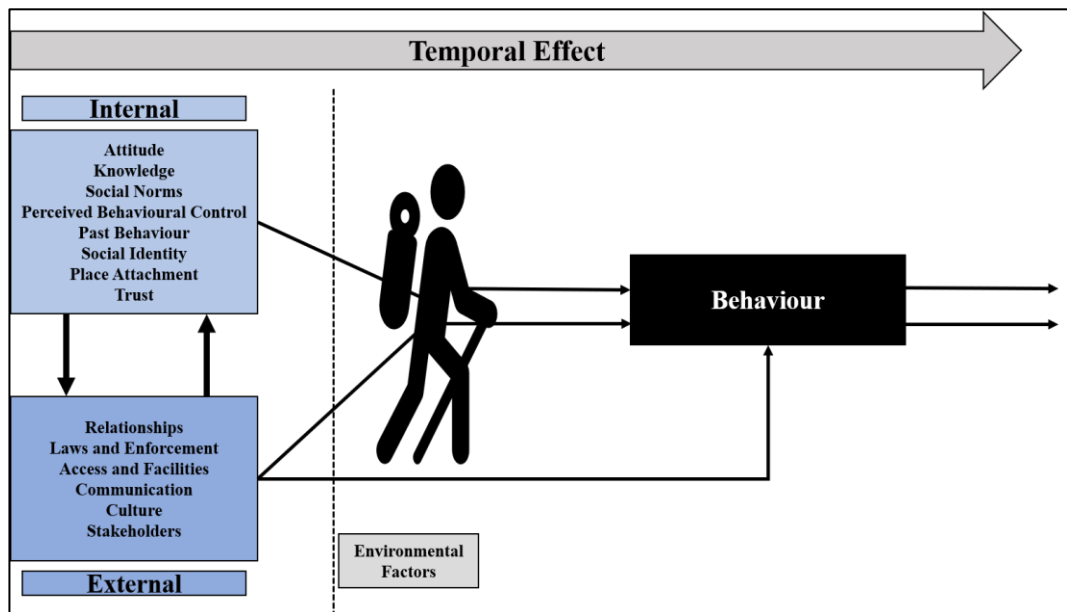
Figure 6.1 Framework illustrating the factors necessary to engender behavioural change

To define them as subsidiaries would be to undervalue the effect that they can have on the design of a behavioural intervention. From the analysis of the data detailed in Chapter 4 and 5, a number of factors were added to the framework to reflect the findings of this research. The following subsections examine the internal and external factors which are essential to the framework for behavioural change.

6.2.1 Evaluation of Internal Factors

Chapter 4 discussed the internal factors which can influence behavioural intention. For clarity and convenience, a brief justification for each factor is outlined in Table 6.1, which summarises some of the main findings of this research.

Table 6.1 Justification for the inclusion of Internal Factors

Factor	Justification	Section
Attitude	Attitude was prevalent in the literature for its use in the design of behavioural interventions. Attitude's importance and relationships with other internal and external factors were found throughout the findings of this research.	4.3.1
Knowledge	The inclusion and separation of knowledge is justified. The analysis of the data, as well as the experiences of the experts in Phase 2 and Phase 3, demonstrated the popularity of educational messaging to induce behavioural change.	4.3.2
Social Norms	The desire to conform to other people's perception of standard behaviour was evident in this research. The analysis of the data suggested that the importance of social norms is significant. A framework for behavioural change needs to incorporate social norms as it presents both an opportunity and a barrier to the development of environmentally responsible behaviours.	4.3.3
Perceived Behavioural Control (PBC)	The findings of this research justify the inclusion of PBC in the framework. The importance of empowerment and the belief that a person can make a difference was evident in the analysis of the data.	4.3.4
Past-Behaviour	The inclusion of past behaviour is justified as it incorporates the effect of time on behavioural intentions. The development of habits and the breaking of routine can be significant barriers to the development of behavioural interventions. The utility of making people aware of the consequences of their actions was an interesting addition to the framework. The factors can serve as motivators of behavioural change, as discussed during the analysis of data in Phase 1, 2 and 3.	4.3.5
Social Identity	The inclusion of social identity is supported as it incorporates how an outdoor recreationist identifies themselves. Knowledge of social identities can allow interventions to be designed which can align the social identities of recreationists with the desired behaviour. This can increase compliance and attach pro-environmental behaviours with a person's sense of self.	4.3.6
Place Attachment	Promoting a sense of ownership in recreationists was a theme that emerged from the analysis of the data. It can supplement established pro-environmental attitudes and instil an emotional need to protect the environment. Place attachment can encourage a more inclusive approach to land management, and its inclusion is justified.	4.3.7
Trust	Co-operation and the development of effective social relationships require trust. The importance of trust was evident throughout the findings chapters. Trust can influence how a person interprets an intervention and how likely they are to comply with desired behaviours. The inclusion of trust is supported as it links with a number of additional internal and external factors.	4.3.8

6.2.2 Evaluation of External Factors

The external factors that can influence behavioural intention are numerous. The justification for their inclusion in the framework for behavioural change has been summarised in Table 6.2.

Table 6.2 Justification for the inclusion of External Factors

Factor	Justification	Section
Relationships	A significant amount of support for the development of relationships emerged from the analysis of this research. Relationships can increase co-operation with communities and develop effective networks. This research demonstrated how a number of factors could have significant relationships with each other. The inclusion and importance of this factor is justified.	5.2
Laws and Enforcement	As discussed in the literature review, the use of regulation has been seen to change behaviour in some cases. The opinions of experts on the concept of law and enforcement highlighted the need to consider a combination of both direct and indirect strategies in the design and implementation of interventions.	5.3
Access and Facilities	Prior knowledge of the access rights of recreationists as well as the possible conflicts that can arise emerged as an important theme. The relationships that access can have with a number of internal factors such as attitude and place attachment make its inclusion in the framework justified. The development of behavioural interventions in the context of outdoor recreation in Ireland will require a working knowledge of facilities. The development of facilities can be expensive and long-lasting, which highlights its importance in the design of behavioural interventions.	5.4
Communication	This factor emerged as an important theme throughout the findings of this research. A number of experts advocated the need to develop communication strategies that are tailored toward a target audience.	5.5
Culture	The development of behavioural interventions needs to consider the culture of the target audience. The importance of culture in the design and implementation of behavioural interventions emerged from the analysis of data from both Phase 2 and Phase 3.	5.6
Stakeholders	Although relationships have already been discussed as well as communication, it is important that consideration must be given to stakeholders in the design of a behavioural intervention. Identification and communication with stakeholders emerged as an essential factor in the building of relationships and the development of interventions, particularly in communities.	4.3, 5.2, 5.4, 5.5 and 5.7

Additional factors which are incorporated into the framework for behavioural change include the influence of time and certain environmental factors. The influence of time emerged from the literature in a number of ways, for instance, the transtheoretical model of behavioural change emphasised the cyclical process of behavioural change and how a person moves through a behavioural cycle over time. In addition, the concept of time arose through discussion with experts in Phase 2 and Phase 3, these discussions focused on how cultures can change and how interventions may lose their efficacy over time. The inclusion of time in the framework is justified

as it illustrates how behavioural change is, in many cases, an iterative process.

The external factors signify the range of elements which can act as a barrier to the development of behavioural interventions. For instance, the skill or leadership qualities of the designer of an intervention may act as a barrier. These external factors can be entirely outside the control of the person who is developing a behavioural intervention and consideration must be given to them.

6.3   Intervention Design and Justification

As discussed in Section 3.7, a small-scale pilot intervention that could test elements of the proposed framework was designed. The intervention was based on several factors that arose from the extensive literature review and as a result of the analysis of the findings. The use of interventions that are based on theoretical frameworks are well established in the literature (Michie, van Stralen and West, 2011; Waligo, Clarke and Hawkins, 2013; The Scottish Government, 2015). The use of interventions to test a framework allows for the analysis, evaluation and possible adaptation of a framework to occur.

6.3.1 Intervention Design

Throughout the findings chapters, communication was a recurrent theme that was developed with experts in both Phase 2 and Phase 3. In particular, Section 5.5 examines the thematic development of communication. The challenge was how to develop an intervention that utilised effective communication strategies. This challenge was overcome by the use of active learning, which allowed fluid dissemination of ideas (Jensen, 2002; Latinopoulos, 2014). Communication between the participants and the researcher allowed for free thought and expression of ideas. In addition, active learning allows for self-reflection and personalisation of the topics

(Derevenskaia, 2014; Torkar, 2014; Freeman et al., 2014; Kuščer and Mihalič, 2019).

The majority of experts in Phase 2 and Phase 3 highlighted the importance of education as a means to change behaviour in the context of outdoor recreation. This theme has been discussed earlier in Section 5.3.1. In addition, the popularity of education-based interventions used in outdoor recreation is prevalent in the literature (Marion and Reid, 2007; Vagias, 2009). Organisations such as Leave No Trace have developed sophisticated courses that teach environmental education through active learning. By focusing on participation, the possibility of communication, engagement and knowledge retention can be increased. The researcher has also completed the Trainer's Course and was well versed in conducting Awareness Workshops for Leave No Trace Ireland. This experience allowed the researcher to design and tailor a workshop using active learning and communication techniques and increase engagement with participants.

The intervention was designed utilising a number of factors from the proposed framework (see Figure 6.1) these include but are not limited to:

- place attachment and social norms
- perceived behavioural control and knowledge
- trust, communication and facilities.

These factors were chosen to test aspects of the framework as well as the relationships that can occur between factors. From discussion with experts in both Phase 2 and Phase 3, it was established that the delivery of an environmental ethos should not appear to be information-heavy preaching. Instead, the focus of the intervention should be on the building of communication and the enjoyment of discussion and discovery. Table 6.3 gives a brief description of each type of activity

used in the intervention as well as a justification for its inclusion.

Table 6.3 Intervention summary

Topic	Activity	Justification
Place Attachment and Social Norms	**The Ethics Activity** The activity was introduced in such a way as to instil a sense of ownership in participants. Participants identified any personal areas in which they like to take part in recreation. When this is done, a description was given of a series of negative impacts that could occur in the area. Participants then rated and discussed the severity of these impacts and what it means to them. In doing so, the respondents thought more about the impacts that can occur in "their" environment rather than "the" environment.	The findings and literature review have suggested that place attachment can be a significant influencer of behaviour. By demonstrating the range of impacts that can occur in a place that has an emotional connection with the participant, the chances of information retention and behaviour change can be increased. Place attachment, much like social norms, is a complicated yet powerful factor in determining behaviour and, as such, needs to be incorporated in the design of behavioural change interventions.
Perceived Behavioural Control and Knowledge	**Breakdown Activity** Participants went through a range of potential waste materials that can be discarded by recreationists. The participants ranked them in order that the materials would break down in the natural environment. Participants then discussed any surprising findings the participants had. In doing, the importance of having the required skill to look after waste responsibly is instilled in participants.	Findings have shown a lack of knowledge regarding the correct course of action for waste disposal in recreationists. In addition, there is an underlying belief that an individual can make a difference with regards to environmental issues. With that in mind, this activity not only informs participants about potential pitfalls, it will empower individuals to be better equipped to deal with problems in the future.
Trust, Communication and Facilities	**Signage Activity** Participants were presented with a series of different signage examples (littering, no access, fines, trespassing, imagery, etc.). The participants were then asked to rate them and to discuss each of them in terms of effectiveness. Participants were asked to make an effective sign to deter a chosen behaviour and then create a blueprint for that sign.	The literature, as well as the findings of this research, have found that traditional signage used in behavioural interventions has had minimal, if any success. The use of interpretative signage has been associated with a greater level of success, and the findings of this research support the use of imagery and supportive language. Communication has been found to be a significant factor in the implementation of behavioural change interventions in the past and is a worthy component of this research.

The goal was to design several activities that would allow participants the opportunity to engage with others as well as the materials provided. Initially, the plan was to conduct the intervention in the outdoors. However, the weather made such endeavours impractical. Instead, a classroom at the Institute of Technology Tralee was the chosen location.

The use of active learning was essential to the delivery of this intervention, the findings of this research have demonstrated that working with participants instead of delivering information is crucial for the development of an environmental ethos. The researcher adapted the activities from their experience with the Leave No Trace Ireland awareness course. The participants were divided into two groups for the intervention. Each group was given interactive materials and images to encourage participation. In addition, each activity was allocated enough time to allow for debate among participants. With each activity, the focus was not solely on the dissemination of knowledge: the activities were designed to encourage environmental thinking, which in turn would cause new questions to arise organically. These questions would encourage and inspire the participants to learn more. It was important for this intervention to not suffer from the same setbacks that have occurred in the past in relation to environmental education. The aim was to empower and encourage environmental thinking and instil a sense of ownership.

6.4 Analysis of Intervention

6.4.1 Intervention Testing

In order to test the effectiveness of the intervention, a seven-point Likert scale survey

with 27 statements was used. The statements were designed to test the student's attitudes towards performing certain behaviours in the outdoors as well as their knowledge and beliefs about responsibility (Little and Eccles, 2010; Widman, 2010; Williams and French, 2011). In order to test the effectiveness of the intervention, each student was given three surveys. One survey was distributed before the intervention, one survey was distributed immediately after the intervention, and a final survey was given one month after the intervention.

The surveys were designed in a similar style to the survey used in Phase 1 of this research, as described in Section 3.4.3. The survey was constructed using a series of attitudinal statements that were scored on a seven-point Likert scale. The full survey is available in Appendix F. The first two surveys were used to test if the intervention changed the scoring on the surveys before and after the intervention. The final survey investigated if the changes (if any) had a lasting impact and if the intervention had any capacity for retention.

As there was a small sample size (13 participants but only 12 useable surveys), any statistical testing of the data would at best be indicative, and the results should not be seen as statistically significant. However, this intervention was designed as a pilot application of the framework to investigate if elements of the proposed framework could be tailored and applied to a specific context (outdoor recreation). While the data cannot be seen as statistically significant, the evidence should suggest whether this framework has merit and should be tested in further research.

For clarity, Table 6.4 details the justification of the survey statements for each topic, along with examples of statements used for each topic.

Table 6.4 Summary of topics used to create Likert scales in Phase 4 survey

Topic	Justification	Examples of Statements
Place Attachment and Social Norms	Participants were presented with item response statements which describe place attachment. These survey questions target the underlying emotional attachment that may be present in participants. As a result of the intervention, a change was expected in the answering to these questions as the participant would have been discussing a location that would have a sense of ownership. A significant flaw in environmental ethics is that the environment is seen as an abstract concept. This intervention and survey questions focused the participant on talking about areas that have importance to them.	There is a place I like in which I recreate quite a lot. I do not care what other people do in the outdoors as long as it doesn't involve me. I get upset when I see other people's rubbish while I am out recreating.
Perceived Behavioural Control and Knowledge	These survey questions were included for several reasons. To begin, they are a decent baseline to test the environmental knowledge of participants. Some of these questions might have been difficult to answer without previous training or forethought. The emphasis on a large amount of behavioural change has been the use of education. This intervention focused on creating discussion rather than supplying information. By accessing predetermined notions and beliefs of participants, a dialogue was created, which aided in the retention of information.	Leaving food scraps is OK because animals need to eat. Cigarette butts break down quickly because they are made of paper. It is just too difficult for somebody like me to do much for the environment.
Trust, Communication and Facilities	These questions were used to judge a participant's opinion on the use of signs and notices in the outdoors. After the intervention, the opinions should change to view signs more favourably or, at least, be able to notice signs more frequently. The research into recreation management advocates the use of signage as a means of engendering compliance with regulations. However, signpost design and messaging have been shown in the past to be a significant factor in their effectiveness.	I read signs/notices when I come across them in the outdoors. I find signs and notices to be interesting and informative, they help me make decisions about my behaviour.

6.4.2 Place Attachment and Social Norms— The Ethics Activity

Pre-Intervention

Ten attitudinal statements in the survey were used to measure the different elements of the behavioural intervention. These statements were scored using a seven-point Likert scale. The scores were combined, and a cumulative score of each element of the intervention was obtained. These statements, in addition to the ethics activity, were designed to raise the awareness of participants of their role in the environment

and to instil a sense of ownership which would then form the basis for the following interventions to have greater impact. The statements also created baseline data which could be compared against the results of the later surveys.

When examining the pre-intervention survey, the total score for respondents in regard to statements concerning Topic 1 was 554 out of 840, which is approximately 66% (n=12). This suggests that the participants in the survey had an awareness regarding place attachment and ownership. However, certain topics suggested greater levels of variation. For instance, one statement, "I do not care what other people do in the outdoors as long as it doesn't involve me", received a significant amount of variation among the participants, as seen in Figure 6.2. To reduce the risk of bias in the respondents and to increase rigour in the analysis, some of the statements were adapted using reverse wording. For the analysis of the data, responses were transformed in order for positive responses to score higher.
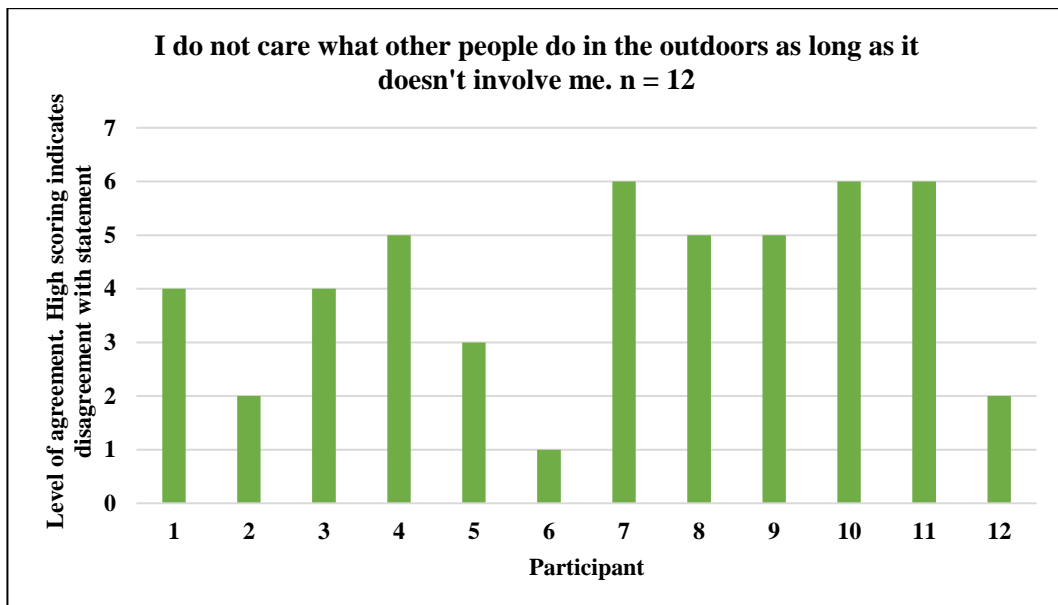
Figure 6.2 Pre-intervention Phase 4 participant responses to "I do not care what other people do in the outdoors as long as it doesn't involve me"

Post-intervention and Follow-Up

Looking at the analysis of the post-intervention survey, the total score for the Likert Scale of Topic 1 was 624 out of 840, which is approximately 74% (n=12). This suggests an increase in the sense of ownership and personal responsibility. Figure 6.3 provides a visual representation of the change in scoring between the pre-intervention and post-intervention.
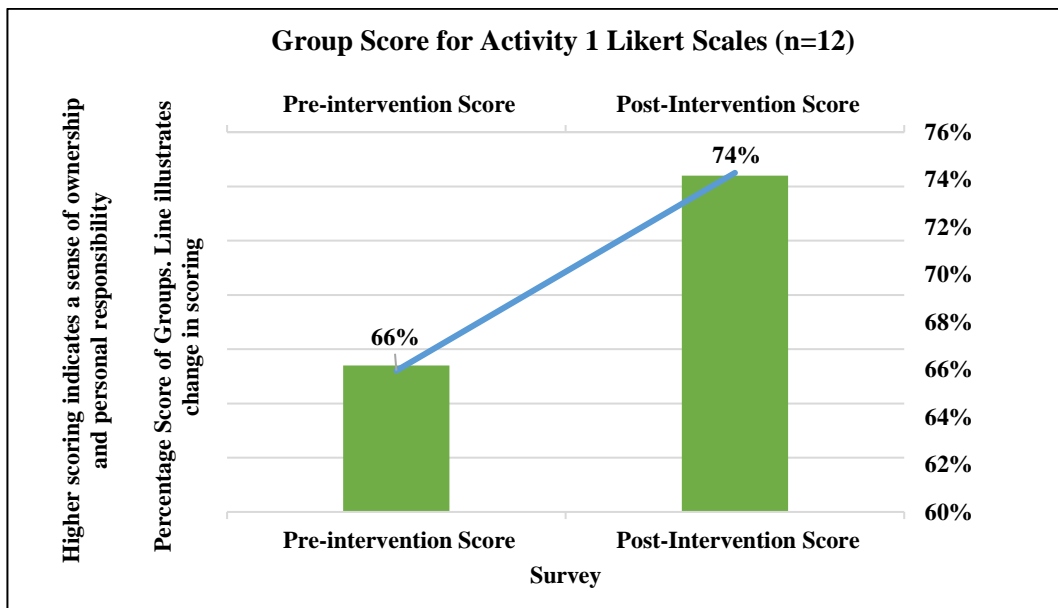
Figure 6.3 Group score for Activity 1 Likert scales (n=12)

This increase in percentage could be an indication that the intervention was successful in increasing awareness in participants of their role in the environment as well as encouraging a sense of ownership and place attachment.

Using the results for "I do not care what other people do in the outdoors as long as it doesn't involve me", Figure 6.4 illustrates how the responses to this individual statement displayed less variation amongst respondents. This could suggest that respondents have gained a sense of ownership and responsibility in regard to their role in the outdoors. It must be stated, however, that the second survey was presented to participants at the end of the intervention while the topics of the intervention were

still fresh in their minds.
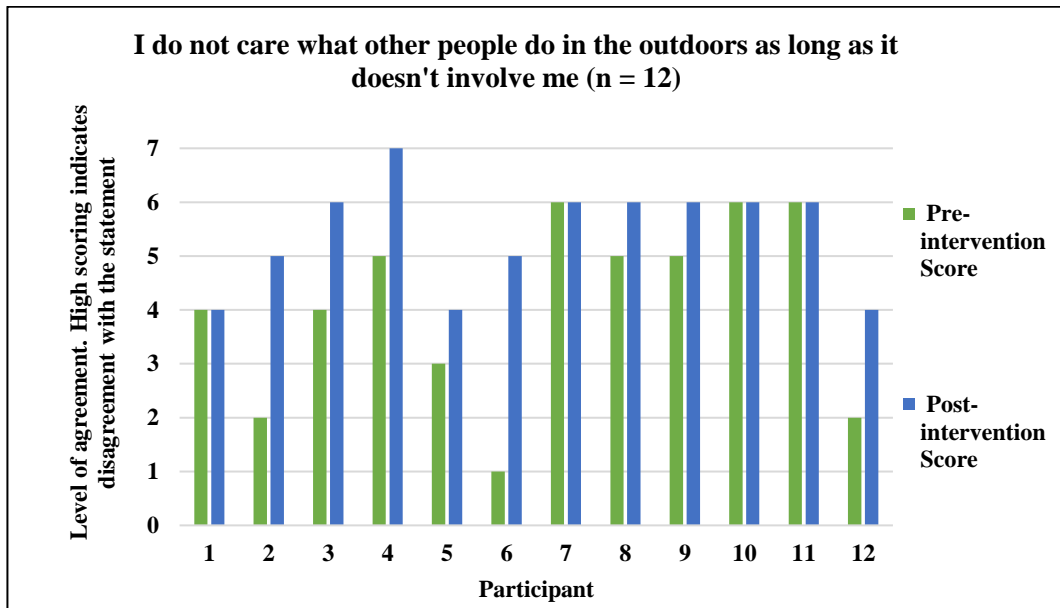
Figure 6.4 Phase 4 pre and post-intervention responses for "I do not care what other people do in the outdoors as long as it doesn't involve me"

In order to examine the long-term retention of place attachment, the third survey was distributed one month after the intervention took place. Analysis of the third survey should be seen as the most important, as the time difference has allowed participants to internalise or forget aspects of the intervention. In addition, the time between surveys allows participants to participate in their preferred recreation and, as such, the opportunity to reflect on the topics covered in the intervention. The total score for the Likert scale of Topic 1 was 615 out of 840, which is approximately 73% (n=12). Figure 6.5 demonstrates the scoring of participants over the course of the three surveys. This was a finding of note, as it suggests that participants retained the sense of ownership acquired in the intervention and have internalised its meaning.
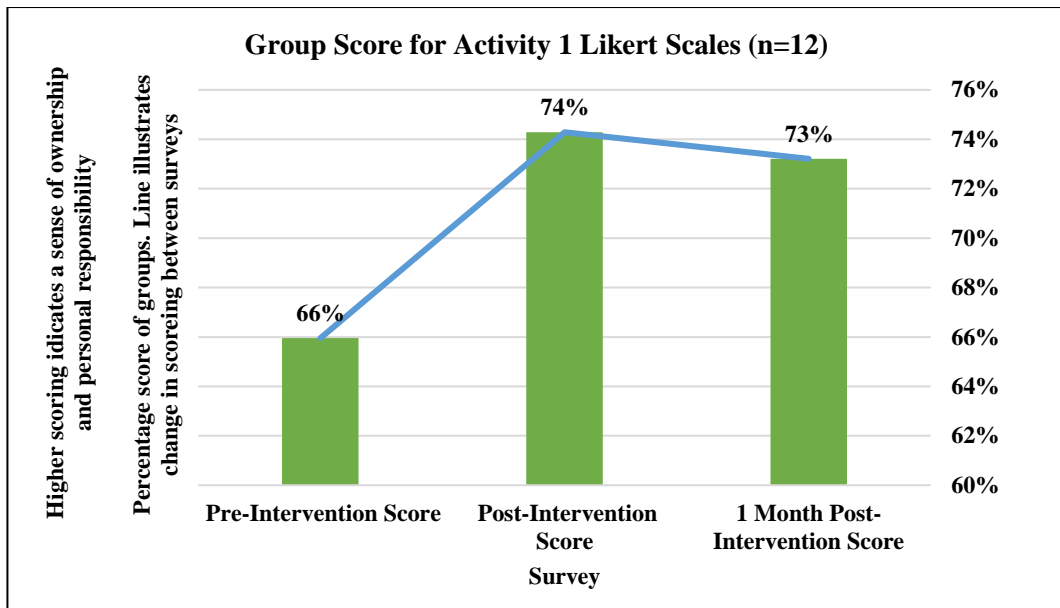
Figure 6.5 Group score for Activity 1 Likert scales (n=12)

Previous studies that have used sequenced surveys have also followed this pattern: where the scores for post-tests show significant improvement and then decline slightly in the follow-up test (Daniels and Marion, 2005). A point of note about the third survey is that while the group score was lower than the scores achieved in the second survey, none of the scores was lower than the scores obtained in the first survey.
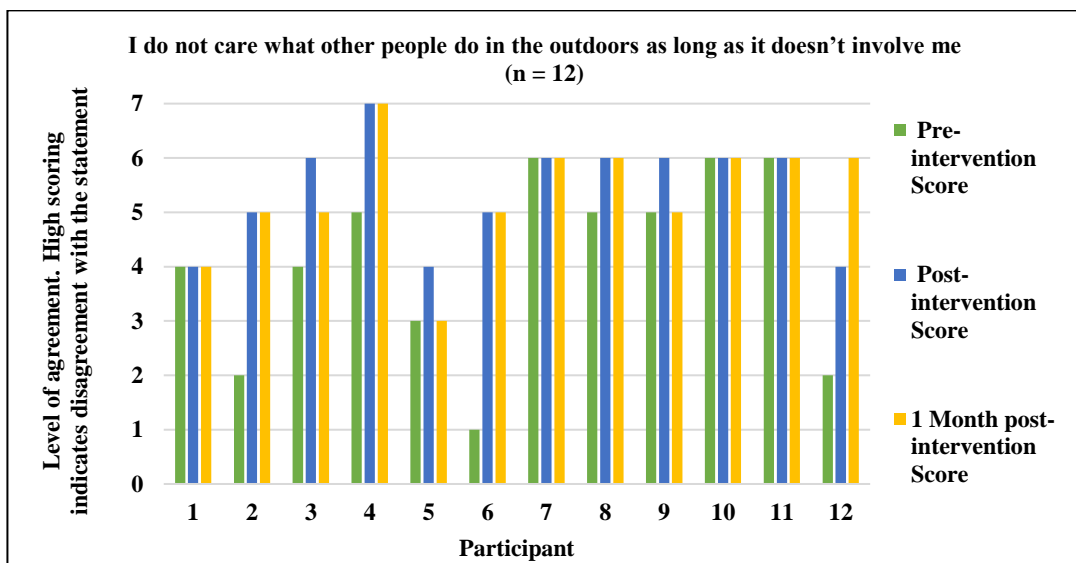
Figure 6.6 Phase 4 pre-intervention, post-intervention and follow-up survey responses for "I do not care what other people do in the outdoors as long as it doesn't involve me"

Looking at the individual statement "I do not care what other people do in the outdoors as long as it doesn't involve me", the follow-up survey showed a positive change in the answering when compared to the initial surveys. This suggests that participants may have engaged with recreation and have taken more notice of the negative impacts that can occur in their environment.

The results of this activity are encouraging but not surprising. The objective of the first activity was to raise awareness in participants and instil a sense of ownership. The month intermission allowed for the sense of ownership to internalise in the minds of each participant. This is encouraging as it supports the incorporation of a number of factors into the framework as well as being supported by the literature as an important factor in the development of environmentally responsible behaviour.

If an intervention can instil a sense of ownership and show possible negative impacts that can occur in "their" environment, then the possibility of compliance with responsible recreation practices can increase (Vagias, 2009; Lee and Oh, 2018; Chow et al., 2019).

6.4.3 Perceived Behavioural Control and Knowledge — The Breakdown Activity

Similar to the methods used in the previous section, ten attitudinal statements from the survey were used to measure the different elements of the behavioural intervention. These statements were scored using a seven-point Likert scale.

Pre-Intervention

The pre-intervention survey examined the perceived behavioural control and environmental knowledge of participants. The total score for the Likert Scale of

Topic 2 was 527 out of 840, which is approximately 63% (n=12). This again suggests that participants had a general understanding of some environmental issues, which was similar to findings found in Section 4.4.2. However, the purpose of the second activity was to build upon aspects of the first in order to empower and inform participants of their role in the environment during outdoor recreation. Figure 6.7 shows the variation in answers regarding the participant's role in the environment and the possible effect that their behaviours could have. The low scoring by a number of individuals echoes a similar thought of TRE02 in Section 4.3.4. TRE02 suggested that in the context of environmentally responsible behaviour, as a nation, people "don't actually see it as their role to do it". The lack of personal responsibility to take care of the environment could be a serious problem as it increases the difficulty of promoting an environmental message to outdoor recreationists who do not see it as their concern.
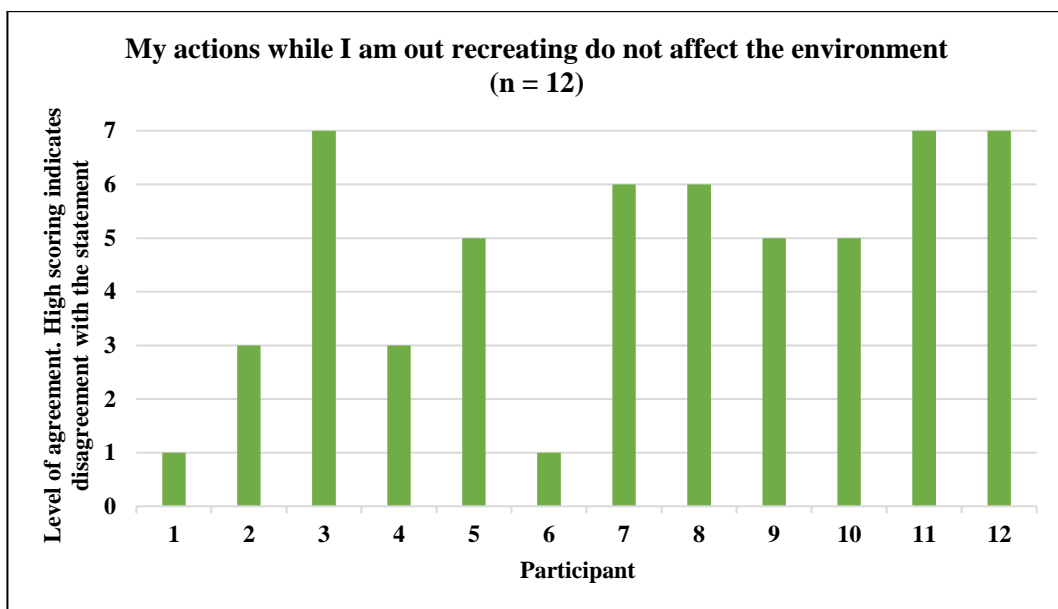
Figure 6.7 Pre-intervention survey responses to "My actions while I am out recreating do not affect the environment"

Post-Intervention and Follow-up

There was an increase in the scoring of participants in the post-intervention survey.

The post-intervention total score for Topic 2 was 622 out of 840, which is approximately 74% (n=12).
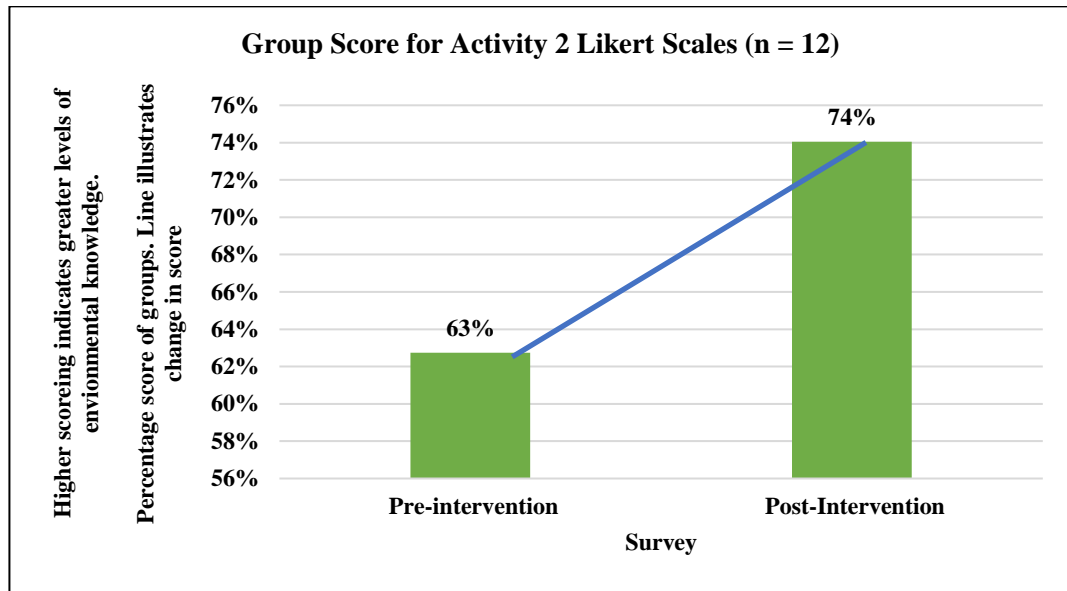
Figure 6.8 Group score for Activity 2 Likert scales (n=12)

This is encouraging as it indicates the message of empowerment was understood by the participants. Figure 6.8 visualises the difference in scoring between the pre- and post-intervention surveys. It is encouraging, but not surprising that the scores for the second module increased, as the activity was based on identifying and discussing the breakdown of many materials in the outdoors. The discussions that followed the activity involved the perceived difficulty of behaving responsibly in the outdoors.

Figure 6.9 gives a visual representation of the change in participants responses to the statement "My actions while I am out recreating do not affect the environment". It suggests that a number of respondents became more aware of their role and how they can have an effect on the environment.
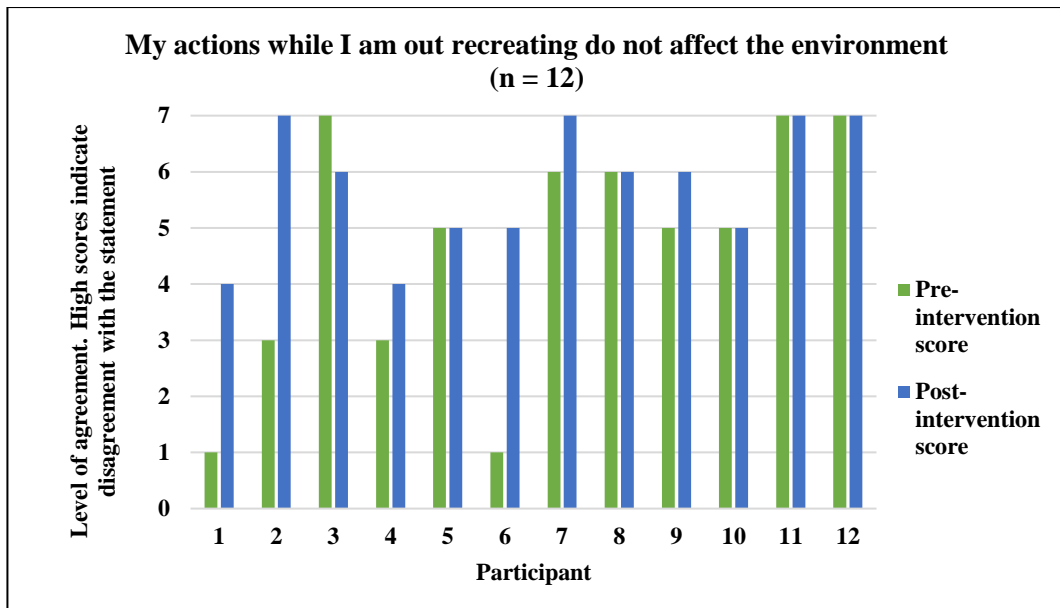
Figure 6.9 Pre- and post-intervention survey responses to "My actions while I am out recreating do not affect the environment"

By inspecting the data on the follow-up survey a month later, there are a number of noteworthy points. The total score for the follow-up survey for Topic 2 was 573 out of 840, which is approximately 68% (n=12). This dip is larger than the drop seen earlier in Section 6.4.2. Figure 6.10 provides a visual representation of the data.
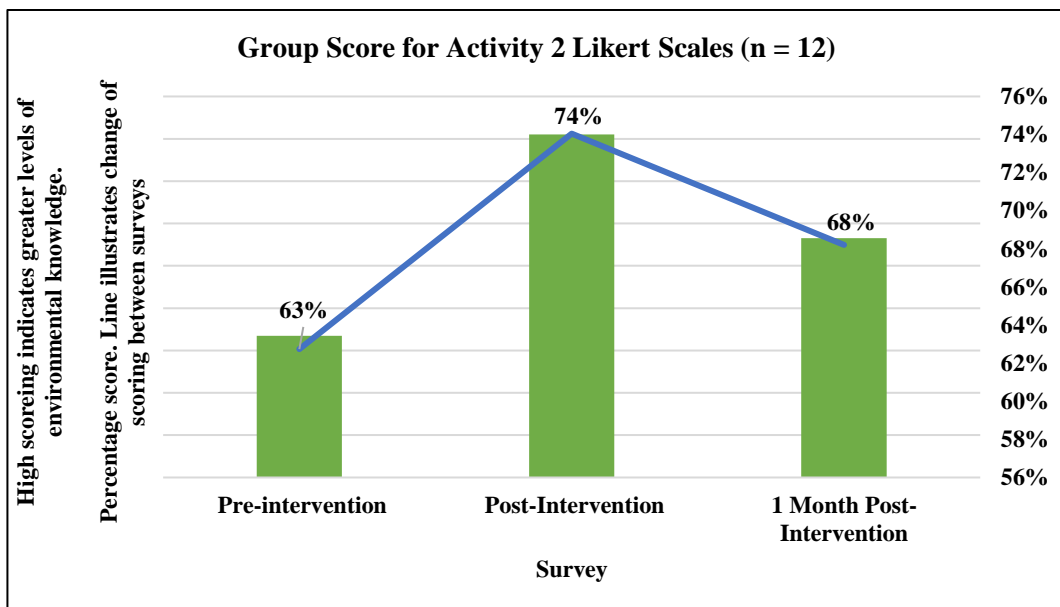
Figure 6.10 Group score for Activity 2 Likert Scales (n=12)

Although the score is lower than the second intervention, the participants were still more knowledgeable about impacts on the environment when compared to pre-

intervention results. When contemplating time and its effect on the efficacy of behavioural interventions, many see behavioural change as an iterative process. Furthermore, the students were left alone for the purpose of this intervention. In the future, interventions would be designed to encourage communication between stakeholders, which may increase knowledge retention.

As a side note, the time of the follow-up survey coincided with the examination period of the Institute of Technology Tralee; therefore, the student's minds may have been preoccupied with their studies. This module was designed to empower participants as well as to inform them of ways that they can make a difference in their daily lives. Figure 6.11 shows that the empowerment and perceived behavioural control continued to remain high in participants to the intervention.
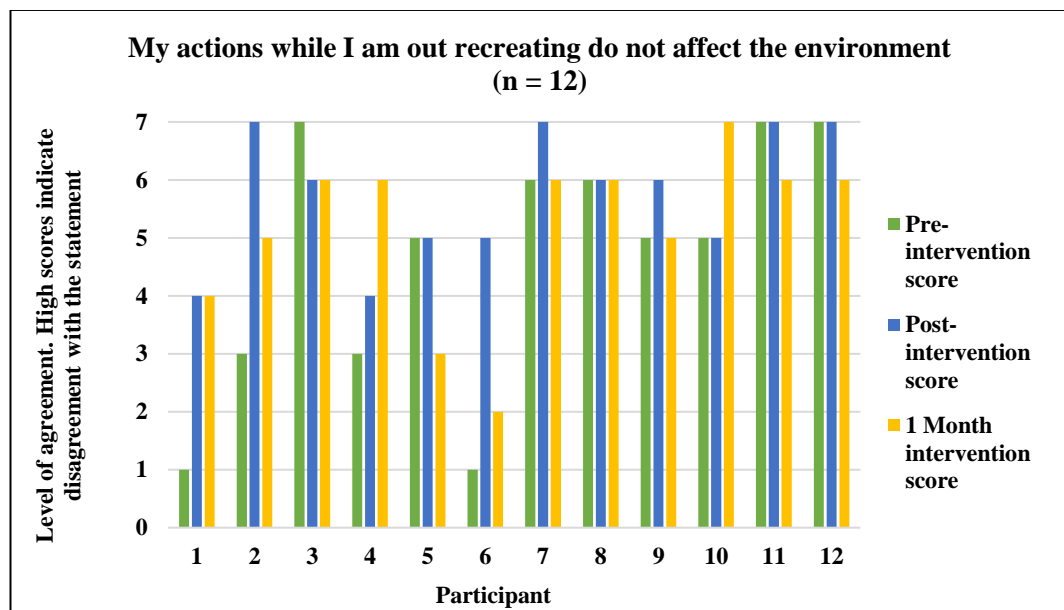
Figure 6.11 Pre-intervention, post-intervention and follow-up intervention survey responses for "My actions while I am out recreating do not affect the environment"

This suggests that focusing an intervention on empowerment and instilling knowledge repeatedly could lead to further compliance with environmentally responsible behaviour. This thought echoes the themes of experts from Section 5.3.

Experts in Phase 2 and Phase 3 showed support for the promotion of education and empowerment as the most effective means to induce behavioural change. This finding suggests that both perceived behavioural control and knowledge are important components of the framework for the design of behavioural interventions. As discussed in Section 2.7.6, making people believe that their actions or behaviours can influence an environment and make a difference can have a large influence on behavioural intentions (Manning and Anderson, 2012).

The research suggests that the combination of aspects of multiple activities could have a cumulative effect when compared to interventions that focus on singular topics. However, more research is needed to investigate this issue. The findings reflect the opinions of behavioural change experts in that, the importance of ownership and explaining why an impact is harmful can be effective motivators for behavioural change.

6.4.4 Trust, Communication and Facilities — The Signage Activity

The third activity was the culmination of the intervention. Using the topics discussed in the initial activity's, participants discussed the effectiveness of signs and communication strategies posted by land management authorities. Participants were presented with a series of different signage examples (littering, no access, fines, trespassing, imagery and dog fouling). The participants were asked to rate them and to discuss each of them in terms of effectiveness, preference, detail and willingness to comply. Possible design ideas for an effective sign to deter a chosen irresponsible behaviour (which was selected from the ethics game) were discussed as well as the creation of a sign blueprint.

Similar to the methods used in the previous section, a number of attitudinal statements were chosen from the survey to measure the different elements of the behavioural intervention. Seven attitudinal statements from the survey were used to measure the different elements of the intervention. These statements were scored using a seven-point Likert scale.

Pre-intervention

The pre-intervention survey examined the attitudes of participants towards the use of signage, as well as the importance of communication and facilities. The total score for the Likert scale for Topic 3 was 378 out of 588, which is approximately 64% (n=12). This score suggests that the participants were conscious of the attempts made to change behaviours in the past, have noticed signs posted in areas, and were aware of the regulations on how to behave when recreating in these areas. As discussed in Section 5.5, this highlights the importance of the language used in interventions. There is significant evidence in the literature on the presentation of signage and the effectiveness of interpretative messaging (Bechtel and Churchman, 2002; Walkosz et al., 2008; Berns and Simpson, 2009; Lawhon et al., 2013).

The statement "Restrictive signs posted in areas can really hinder my enjoyment of the outdoors" examined the attitude of respondents towards the use of signage in the outdoors.
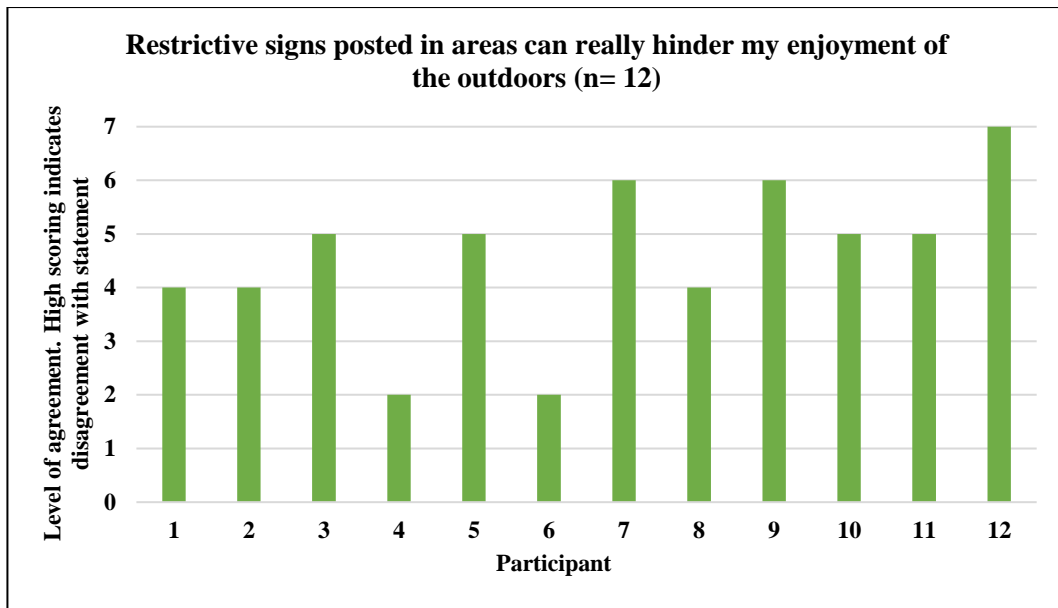
Figure 6.12 Pre-intervention survey response for "Restrictive signs posted in areas can really hinder my enjoyment of the outdoors"

As with a number of statements, the wording was altered, which means the responses were transformed to enable their inclusion into scales. Figure 6.12 illustrates how respondents felt about the use of restrictive signage in the outdoors. Encouragingly, most respondents did not have a negative attitude towards the use of signage in the outdoors. A debate was initiated regarding what constituted an effective sign. There were several different opinions on the amount of wording that a sign should have. Most participants identified a good use of imagery combined with non-authoritative wording to be more effective.

This finding is similar to the opinions expressed by a number of recreational and behavioural change experts in both Phase 2 and Phase 3, which can be seen in Chapter 5. For example, in Section 5.5.1, BCE08 discussed using imagery in a campaign that was used by land management officials in the United States. BCE08 argued that the clear images of the problem made it so "that anyone could identify what is wrong in the area".

Post-intervention and Follow-up

The results of the post-intervention survey revealed a marginal difference in scoring. The total score for Topic 3 was 384 out of 588, which is approximately 65% (n=12).

This is a comparatively small change in scoring among participants, a possible reason for this apparent lack of impact could stem from the fact that while the intervention just took place, a number of the response items rely on previous experiences to ascertain attitudes. As such, the participants did not have enough time to internalise the activities ethos and evaluate their attitudes with a new perspective. Some statements showed differences in answering from the respondents.
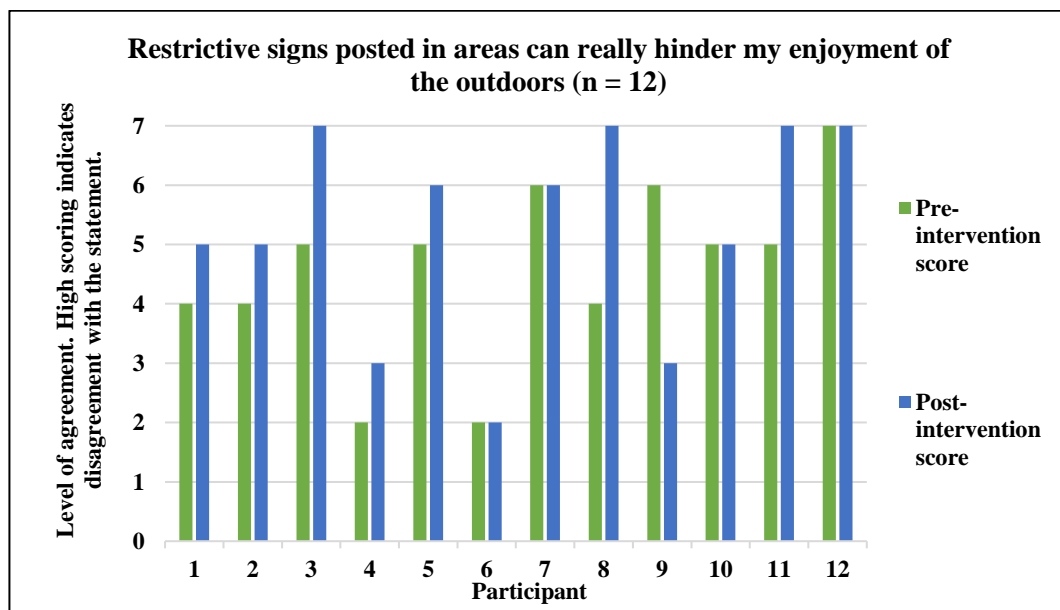
Figure 6.13 Pre-intervention and post-intervention survey response for "Restrictive signs posted in areas can really hinder my enjoyment of the outdoors"

Figure 6.13 demonstrates an initial change in attitude towards the use of restrictive signage. Several participants were more critical of the language used rather than the justification of the use of a sign. As the range of environmental impacts had been discussed throughout the intervention, more support was shown towards the use of educative messaging to encourage environmentally responsible behaviour.

The third survey, which was completed one month later, yielded some noteworthy results. The total score for Topic 3 was 419 out of 588, which is approximately 71% (n=12). Figure 6.14 gives a visual representation of the scores.
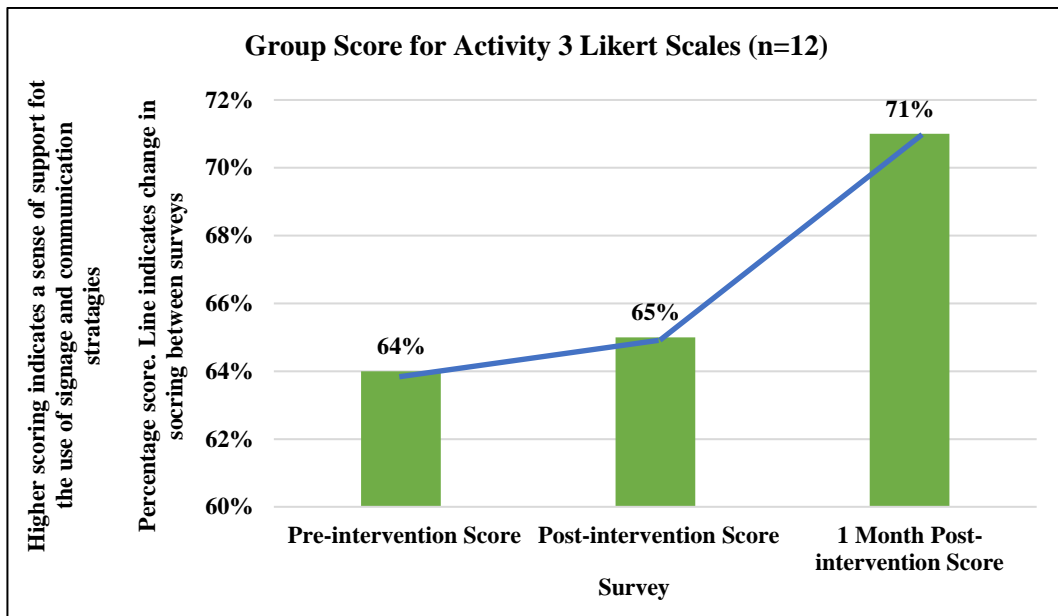
Figure 6.14 Group Score for Activity 3 Likert Scales (n=12)

The difference between the pre-intervention and post-intervention was negligible. The follow-up survey demonstrates a larger change in attitude. One possible reason for this change could be due to the time between surveys. As stated previously, participants would have had time to internalise the main themes of the intervention. This could have increased their awareness of communication strategies while they engaged in recreation. In addition, the increase in the sense of ownership, coupled with the empowerment from the intervention, may have contributed to the participants change in perspective.

Figure 6.15 shows how the perceptions of the participants may have changed regarding the use of restrictive signs. The positive change seen in the post-intervention was retained and increased in the follow-up survey. This suggests that the participants acknowledge that the use of signage in outdoor recreational areas is

for the maintenance and wellbeing of the area.
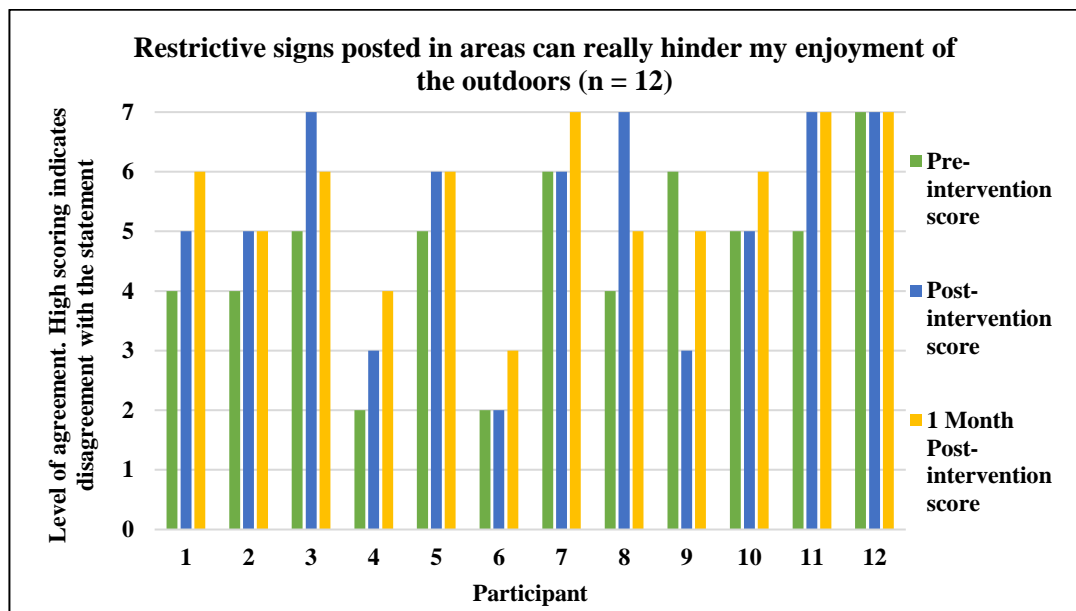
Figure 6.15 Pre-intervention, post-intervention and follow-up survey response for "Restrictive signs posted in areas can really hinder my enjoyment of the outdoors"

The analysis suggests that while participants had prior experience of attempted interventions by land management officials in the past, this prior awareness did not instil as much ownership, knowledge and perceived behavioural control as this intervention. Although aware of the previous attempts at communication, the findings suggest that a more interpretative, inclusive approach explaining the "why" instead of demanding compliance may have more influence in the future. This approach is found in the literature and discussed by experts in both Phase 2 and 3 of this research (Richards and Munsters, 2010; Hynes, Norton and Corless, 2014; The Scottish Government, 2015).

6.5   Intervention Evaluation

As stated in the literature review, one of the main criticisms used in behavioural change has been the lack of evaluation of behavioural theory in the design of an intervention. A small-scale intervention that could test elements of the proposed

framework was designed. Using activity-based learning and inclusive communicative techniques produced some interesting results.

Table 6.5 Intervention results summary

Intervention Activity and Framework Theme	Pre-Intervention Survey Score	Post-Intervention Survey Score	Follow-up Intervention Survey Score
Place Attachment & Social Norms	66%	74%	73%
Perceived Behavioural Control and Knowledge	63%	74%	68%
Trust, Communication and Facilities	64%	65%	71%

Table 6.5 gives a summary of the intervention results described earlier in the chapter. At its most basic level, it appears as though the intervention was a success. The participants showed a change in their attitudinal scoring across the factors in the framework. In addition, these changes were retained and, in one case, increased in the follow-up survey. The retention and increase observed in the scoring is similar to the research conducted by Bogner (1998), who used post-intervention testing to evaluate the efficacy of environmental training programs. Bogner's study suggested that although both the short and long courses produced favourable results in terms of environmental knowledge, the longer course resulted in a shift in behavioural intention (Bogner, 1998). The use of multiple timescales allowed for the observation of time's effect on the scoring of participants (Erdogan, 2015). This is important as studies have shown the potential for previous behaviours to return to the dominant factors which can influence behavioural intention (Kwasnicka et al., 2016). These findings support the view that post-testing, in addition to evaluation, support and self-regulation are important factors in long-term behavioural change (Bogner, 1998; Kwasnicka et al., 2016).

As previously discussed, the limitations placed on this intervention, including the

sample size, means that the results of this intervention cannot be regarded as statistically significant. As is the nature of doctoral research, funding, time and other resources play a significant role in what a researcher can do. This intervention testing demonstrates what the framework could be, not what it is.

6.6   Chapter Summary

This chapter involved the testing of a theoretical framework that was developed based on data collected throughout the research. The intervention was designed using activity-based learning in order to encourage an environmental ethos. The intervention which tested a number of factors of the proposed framework revealed some interesting points. For instance, the combination of multiple factors into a multifaceted approach could be suggested to have a cumulative effect on the participants. In addition, the testing of this framework reinforces the thoughts and observations of the experts in Phase 2 and 3 of this research. The use of a three-phase survey instrument allowed the researcher to examine the effect of time on the retention of core elements of the intervention with the participants. The use of active learning allowed for a more communicative and co-creative approach to environmental education. This research supports the theory that active learning can aid in the retention of information and can encourage self-reflection (Torkar, 2014; Derevenskaia, 2014; Kuščer and Mihalič, 2019).

Focusing on place attachment and the role of the recreationist, while at the same time removing the stigma of blame, allowed the researcher to engage in open, guilt-free communication with the participants. The activities were designed to be engaging and to clearly illustrate the need for environmental awareness in outdoor recreation. Analysis of the survey data demonstrated retention regarding the topics covered

during the intervention. This is an encouraging finding as a major concern for the design of behavioural interventions is the longevity of an intervention. If an intervention is designed using elements of the proposed framework, with emphasis on effective communicative and collaborative techniques, then the retention and encouragement of an environmental ethos should be increased. Although the intervention did not state relationships as one of the factors to be tested, the interconnections between the modules as well as the internal and external factors of the framework were evident.

In addition, the importance of communication, trust and ownership were identified throughout the findings chapters as well as evidenced in the intervention. The intervention defends the separation of the internal and external factors in the theoretical framework as it allows for a clearer vision of the possible relationships between factors. This will allow for combinations that could have a potentially greater impact on behavioural intentions to be incorporated into intervention design.

As stated in the literature review and methodology chapters, the objective of this research was to develop and apply a theoretical framework illustrating the factors required to engender environmentally responsible behaviours in recreationists. In the next chapter, conclusions are presented based on the main findings and key points will be highlighted. Recommendations based on the key points are presented in relation to policy, practical application and future research.

Chapter 7:   Conclusions and Recommendations

7.1   Introduction

This research was undertaken to identify the attitudes and behaviours of outdoor recreationists and activity tourists with a view to developing a theoretical framework that would aid in the sustainable development of outdoor recreation and activity tourism. The research had specific objectives, as seen in Section 1.3:

- Examine the attitudes and behaviours of outdoor recreationists in Ireland regarding environmentally responsible behaviour.
- Review and critique the evolving theories relating to behavioural change.
- Investigate and evaluate the efficacy of strategies used to achieve behavioural change in a range of contexts.
- Develop and apply a theoretical framework illustrating the factors required to engender environmentally responsible behaviours in recreationists.

In this chapter, conclusions are presented on the main findings, and critical points are highlighted. Recommendations based on the key points are also presented, including policy recommendations, practical recommendations and recommendations for future research. The chapter concludes with a self-reflection section on the overall research process.

7.2   Chapter Overview

Following an extensive review of the literature, it was established that activity tourism is emerging as a significant segment of the global tourism market (Adventure Travel Trade Association, 2013, 2018). An essential element to the promotion of activity tourism is the availability and sustainable development of outdoor recreational facilities. The growth of outdoor recreation by both local residents and

tourists has had numerous economic, health and societal benefits for Ireland. However, the negative impacts of irresponsible recreational behaviours are a significant threat to the development and longevity of these natural resources and the industry. There is a lack of knowledge regarding the attitudes and behaviours of outdoor recreationists concerning environmentally responsible behaviours due to the shortage of relevant research in Ireland. This shortage could hinder the implementation of environmental strategies and, thus, the future of this vital industry.

The use of behavioural theories in the design of behavioural interventions has been found in the literature and the analysis of the data. All three of the most prominent theoretical frameworks (the transtheoretical model of behavioural change, social cognitive theory and the theory of planned behaviour) have been well documented in the literature and have been incorporated into many behavioural interventions (Webb and Sheeran, 2006; Abraham and Michie, 2008; Godin et al., 2008; Young et al., 2014). While the use of all three has received significant support as well as criticism in various studies, there is enough evidence to defend the use of a theoretical framework in the design of behavioural interventions.

Nonetheless, there seems to be an unwillingness to add new aspects to established theories and frameworks (Hagger and Chatzisarantis, 2005; Kaiser, 2008). Most studies would advocate that a variety of motivations or factors can influence behaviour at any one time and that the influence of certain factors (for example, social norms) can be more prominent at different times. However, there is a lack of adaptability in the creation of these theoretical frameworks and, by extension, the design of behavioural interventions. Behaviour change is not a simple thing to understand and is indeed multi-faceted. Although there have been many attempts to

change behaviour in a variety of contexts, a gold standard method has not been found.

There are many strategies used in intervention design, each with strengths and weaknesses depending on several factors. Selecting the most appropriate method requires a significant amount of knowledge on the sociological and cultural aspects of the target audience. Although not necessarily evident or indeed mentioned, in some studies, the importance of developing effective communication with local communities is regarded as a core component of successful intervention delivery (Marion and Reid, 2007; Lee, Jan and Yang, 2013; Burger and Caputo, 2015). The proposed framework was the culmination of an extensive literature review across multiple disciplines regarding behavioural change. The framework incorporated a number of the most important components of behavioural change research and provided a structure which allowed for the investigation of these components.

The researcher developed and applied the methods of sequential triangulation, which are discussed comprehensively in Chapter 3. Phase 1 consisted of a survey of recreationists, which is described in more detail in Section 3.4. Building on the analysis of Phase 1, Phase 2 consisted of a series of expert interviews involving participants in the field of outdoor recreation and tourism in Ireland (see Section 3.5). Phase 3 investigated the application of theoretical knowledge with real-world examples and how the two interrelate and affect each other, which is discussed in Section 3.6. Finally, the theoretical framework was tested and evaluated in Phase 4 (see Section 3.7).

7.3   Summary of Findings and Conclusions

This section summarises the findings and conclusions of the research in relation to

each of the aims and objectives described in Section 1.3.

7.3.1 Objective One: Examine the Attitudes and Behaviours of Outdoor Recreationists in Ireland Regarding Environmentally Responsible Behaviour

The theory of planned behaviour suggests that knowledge is a fundamental component in the formation of attitudes and that these are one of the key influencers of behavioural intentions (Ajzen, 2002b). With this in mind, it was decided to also examine the knowledge of participants. The results of the data analysis suggested that both the environmental attitude and knowledge of survey participants was relatively high, which should be encouraging as both factors are known to be influencers of behavioural intention. However, further examination of the data suggests that there was variation with regards to knowledge of environmental processes (see Section 4.3.2). The data suggests that not only are participants unaware of the negative impacts associated with some of their actions but that some behaviours which are harmful to the environment are carried out with the belief that they cause no adverse impacts. Evidence of this has been identified in the literature. For instance, the theft or taking of souvenirs from the Petrified Forest National Park in Arizona has caused numerous issues for the management according to Trafimow and Borrie (1999).

This study serves as an example of disassociation between what we think our behaviours are and the impacts that they can have on the natural environment. The attitude–behaviour gap described earlier identified the potential difficulties of relying on just attitudinal change in behavioural interventions. However, in discussions with behavioural change experts in Phase 2 and Phase 3, the exclusion of attitude as a factor in intervention design is also not without issue. This would suggest that instead

of designing behavioural interventions using attitude as a core focus of the intervention, efforts should be made to include not only attitude but also the effects of attitude on other factors in the design process. This research supports the idea that attitude is an essential aspect of behavioural intention. However, interventions in the future cannot solely rely on attitudinal messaging to enact behavioural change in recreationists. It is illogical to work on the assumption that human behaviour is entirely controlled by rational thought processes; the myriad of influencing factors seen in this research is a testament to that.

The concept of the knowledge-behaviour gap was discussed in the series of expert interviews. An issue of particular interest from an Irish perspective is the issue of trail degradation and its impact on the sustainable development of tourism in Ireland (Irish Sports Council, 2005; Comhairle Na Tuaithe, 2006; Madden, 2009). For example, TRE03 stated, "A lot of people go where their feet feel comfortable, walking not necessarily on the path, they do not realise that they are causing erosion".

The variation in knowledge seen between different topics suggests that despite evidence of a pro-environmental attitude (see Section 4.3.1), there exists a lack of understanding in the range of impacts that can be caused by outdoor recreation. There is a growing consensus among researchers that only a small amount of pro-environmental behaviour can be explained using knowledge or environmental awareness. This is developed further by other scholars who suggest that knowledge itself is not an influence on environmental behaviour. Instead, knowledge should be seen as more of a modifier towards environmental awareness and values.

Working with management organisations, it is crucial that divergence from past

interventions that relied on large scale activities be adopted. For example, this research indicated that in order to impart knowledge in participants, they must have an environmental ethic, they must feel inspired to make a difference, they should have the support of community groups, the information should be tailored to suit them, they need to trust and have a positive relationship with the source of the information, and there needs to be a strategy to ensure longevity. Given the number of additional requirements listed above, it is clear that the efforts made to induce behavioural change in the past, while worthy, have been relatively ineffectual. This is particularly evident in terms of authoritative signs which post warnings about prosecution. These signs are unrealistic and not stringently enforceable outside of a well-monitored urban park and, in terms of the countryside, one could argue that it is a complete waste of resources. Instead, smaller community-led initiatives that increase compliance with regulations need to be designed.

Leave No Trace Ireland is involved with one such initiative in Co. Donegal. It is the first of its kind in Ireland and will support outdoor recreational groups and communities by providing them with a series of free custom educational training workshops as well as resources to enable them to protect, preserve and enhance responsible outdoor recreation in Donegal's upland, coastal and inland environments. The pilot initiative has received support from both the Donegal Local Development Company as well as LEADER. LEADER is a rural development network which has provided rural communities across the European Union with the resources to enable local partners to engage and direct the local development of their area actively. These initiatives require the support of governmental bodies such as county councils and governmental departments.

Furthermore, there needs to be cohesion throughout the development and conducting of these programmes as well as engagement with local communities. There is substantial evidence of a breakdown of trust in some cases, between the public and the government, especially in recent years. Working together on a common issue will enable the rebuilding of a working relationship.

When investigating the perceived behavioural control of survey participants, the performing of individual environmentally responsible behaviours was not seen by survey respondents to be overly complicated. However, there were a significant number of respondents who felt that behaving responsibly was more difficult in the broad sense compared to individual statements. This suggests that the perceived difficulty of practising environmentally responsible behaviour, in general, is higher than when behaviours are examined on an individual level, which could be an exciting development for the promotion of environmentally responsible behaviours.

Efforts should be made to design behavioural interventions tailored to the most significant issue in an area and to focus on the particular, rather than the general. Using a pre-existing intervention design as a panacea may not be as effective, especially if the issue is specific and not general. For instance, if local users in the area have identified plastic to be the issue on a running track, then co-creating a tailored intervention which targets the issue should be used instead of the ineffectual "No Littering" sign. Instead of trying to promote environmental programmes involving all aspects of environmentally responsible behaviour, this research suggests that a more tailored approach must be adopted. By targeting specific negative impacts, there is a possibility of encouraging what is known as a spill-over in the practising of environmentally responsible behaviour (Truelove et al., 2014;

Lauren et al., 2016). Working with communities on issues important to them will increase compliance. When a working relationship has been established, more initiatives can be designed and implemented that are based on the needs of the community, not on what experts outside the community think is needed.

A significant finding throughout the investigation of the current behaviour of stakeholders was the influence of social norms on behavioural intention. If the variation in environmental attitude and perceived behavioural control can be affected by the use of social norms, then it is imperative that research is done to identify and examine the group dynamics of outdoor recreationists in Ireland. By understanding group dynamics, a pro-environmental approach using social norms could have a more immediate uptake when compared to the promotion of environmental literature alone. The desire to conform to what other people believe as the standard behaviour presents both an opportunity and a barrier to the development of environmentally responsible behaviours. As this research made clear, behaviour is complex. Designing an intervention without regard for the complexity and multi-faceted nature of behaviour is fraught with obstacles and can easily be met with push back and non-compliance. As discussed by experts in both Phase 2 and Phase 3 of this research, resources are limited. Massive uninformed campaigns are a luxury that land management authorities cannot afford.

7.3.2 Objective Two: Review and Critique the Evolving Theories Relating to Behavioural Change

Despite the number of studies that claim their interventions are theory-based, there is growing concern by scholars about the validity of such claims (Michie and Prestwich, 2010; Cane, O'Connor and Michie, 2012; Davis et al., 2015). An issue

found in the literature is that a number of studies pay lip service to a theory in order to raise its apparent validity and prestige (Michie and Prestwich, 2010; Prestwich et al., 2014; Stacey et al., 2015). Questions have been raised on the use of behavioural theories in regard to the level to which a theory influences the development of an intervention or merely gives 'lip-service' to appear more academic and robust (Michie and Prestwich, 2010). Furthermore, and equally worrying, is the adoption of a particular theory based solely on its popularity instead of its applicability (Michie and Prestwich, 2010). This could result in the development of interventions that are not fit for purpose, which might also hinder the promotion of more relevant frameworks that were overlooked on the grounds of academic popularity (Whitelaw et al., 2000; Sutton, 2001; Brug et al., 2005).

The importance of theory in behavioural intervention design showed variances between experts, with most respondents feeling that behavioural theory, as it is currently perceived, is too rigid. What was interesting about this line of questioning was the variance of answers in relation to theory. Some experts felt that their work was influenced by theory yet were unable to identify which theory, in particular, influenced them. The original behavioural theories that were mentioned were the theory of planned behaviour and nudge theory, both of which are discussed in the literature review. This was not surprising as both theories are well known in the field of behavioural change. However, what was surprising was a lack of mention of or reference to other theories. An important aspect discussed in the literature review is the evaluation of behavioural theory and interventions. The concept of evaluation and feedback was discussed with behavioural change experts as well as the inclusion of theory in behavioural interventions. There seems to be a lack of significant empirical evidence to support the use of theory-based intervention design (Webb and

Sheeran, 2006; Young et al., 2014; Prestwich et al., 2014; Stacey et al., 2015). Many critics of the popular theories focus their critique on the empirical evidence of research papers and the success of interventions (Smith and Hitt, 2005; Webb and Sheeran, 2006). Instead of critiquing a theory based on the lack of empirical evidence, more effort must be made to increase the amount of empirical evidence. By using theory in the design of an intervention, researchers will be contributing to the amount of evidence that can then be critiqued. There is a need to reveal and ignore the studies that pay lip service to theory and to instead evaluate the intervention design that adheres to theory. Interventions do not strictly need to be designed by experts in behavioural change: in many cases, community-led groups can develop and apply behavioural interventions that can be successful. Knowledge of behavioural change is, however, useful in determining why an intervention is successful (or not).

7.3.3 Objective Three: Investigate and Evaluate the Efficacy of Strategies Used to Achieve Behavioural Change in a Range of Contexts

The way in which an intervention is classed as successful can be a complicated issue (The Scottish Government, 2015; Friman, Huck and Olsson, 2017). The United States Federal Government initially used regulations as a means to mitigate the effects of negative impacts and to curb irresponsible behaviour. Regulation can be a useful measure to instil behavioural change, particularly in the short term (Wunder, 2000). However, research has shown that such methods are not effective, particularly for long-term behaviour change (Cole, 1989; Manning, 2007; Steg, Van Den Berg and De Groot, 2013). Regulation should not be seen as the intrusion of authority. Instead, regulation needs to be viewed and utilised as a support to the creation of an

environmental ethic. In outdoor recreation, enforcement is nearly impossible in many cases: multi-faceted approaches to increase compliance with regulations is the only way to develop outdoor recreation and activity tourism sustainably. It is true that some negative behaviours are caused by malicious intent; however, these behaviours lie outside the purview of environmental education and serve as an example of why some laws are necessary.

Working with communities on the normalisation of environmental ethics could encourage self-regulation and reporting of these activities, which can lead to prosecutions and a reduction in these behaviours. This is not possible if there is no co-operation between recreationists and land management officials. The use of regulation and a top-down approach to policy implementation has been met with significant pushback, particularly in Ireland (Ní Dhubháin et al., 2009; Hynes, Norton and Corless, 2014). This suggests that in the pursuit of long-term behaviour change, authorities must look beyond rational determinants of behaviour and consider communication and educational strategies. The issue of trust and its importance to the design of behavioural interventions was discussed further with experts in Phase 3. BCE10 identified trust as one of the crucial factors in developing a behavioural intervention. They claimed that in order to develop a successful intervention in Ireland, "you need to build the level of trust between the people you want to get involved with and want to do things with". In addition, a level of honesty is essential in building this trust. Section 4.3.7 discussed access conflict between recreationists and landowners, which could have far-reaching consequences in relation to behavioural change as a breakdown in trust can act as a barrier to finding an amenable solution (Mann and Leahy, 2010; Haukeland, 2011; Hynes, Norton and Corless, 2014).

The importance of effective communication was a constant theme throughout the findings chapters. Research suggested that the use of imagery and statistics signage in recreational areas has become more perceptible. This presents an opportunity for increased adherence to recommended practices (Wimpey and Marion, 2010; Taff, 2012; Newman, Lawhon and Taff, 2013). The use of imagery is of particular importance to Ireland, as we have seen an increase in visitors from non-English-speaking countries in recent years (Fáilte Ireland, 2019). BCE08 argued that the use of imagery and reliable statistics can be an effective means to overcome some of these challenges.

As discussed in Section 2.7, the factors that influence behaviour are interlinked and not easily quantifiable. The interrelationships between these factors are dynamic and require further study as a strong influence on one behaviour can vary under different situations and circumstances. Positive feedback to an intervention or a product can serve as an indication of what works and what does not, which can be of critical importance to behavioural change in outdoor recreation as monitoring these behaviours can be nearly impossible. In relation to the topic of feedback, the poor execution of eco-tourism initiatives, for example, Taijiang National Park (Taiwan) Puerto Bolivar (Ecuador), Nanda Devi Biosphere Reserve (India), and Wolong Natural Reserve (China) led to a backlash from the local communities, which resulted in operational and cultural problems that had not been predicted (Das and Chatterjee, 2015). Examples like this, coupled with the insights gleaned from the interviews, emphasise the importance of understanding the target audience (Müllner, Linsenmair and Wikelski, 2004; Horton, 2009; Youdelis, 2013; Das and Chatterjee, 2015).

As BCE08 discussed, most behavioural interventions in the context of outdoor recreation "are aimed at tackling the unskilled, uninformed and careless behaviours"; however, some behaviours such as malicious or illegal actions cannot be significantly altered with behavioural interventions. BCE09 built further on this point by discussing the direct management approach to behavioural change. BCE09 felt that direct management, such as limiting use or fining people, "seems to be the most effective strategy, but it is not a reality". This is due to the simple fact that enforcement would be impossible over such a geographically diverse system.

7.3.4 Objective Four: Develop and Apply a Theoretical Framework Illustrating the Factors Required to Engender Environmentally Responsible Behaviours in Recreationists

Following extensive review and critique of the relevant literature, a framework was designed based on the theory of planned behaviour, social cognitive theory and the transtheoretical model of behavioural change. It incorporated their respective strengths while at the same time, mitigating the relative weaknesses identified by their respective critics in the literature described in Section 2.7.8.

The framework evolved with the analysis of the data that emerged throughout the findings chapters. The research suggested that the coalescence of such a large variety of factors into a small number of headings may ignore some of the complexity of human behaviour and allow for a missed opportunity in intervention design. The range of factors that can engender environmentally responsible behaviour makes the application of a framework complicated and exciting.

To test the effectiveness of the framework, an intervention was designed that targeted specific aspects of the behavioural framework. The use of interventions that are

based on theoretical frameworks are well established in the literature (Michie, van Stralen and West, 2011; Waligo, Clarke and Hawkins, 2013; The Scottish Government, 2015). The use of interventions to test a framework allows for the analysis, evaluation and possibly adaptation of a framework to occur. The researcher posits that the strength of this framework is its adaptability and applicability to various situations. The researcher was limited in resources. However, a small-scale intervention that could test elements of the proposed framework was designed.
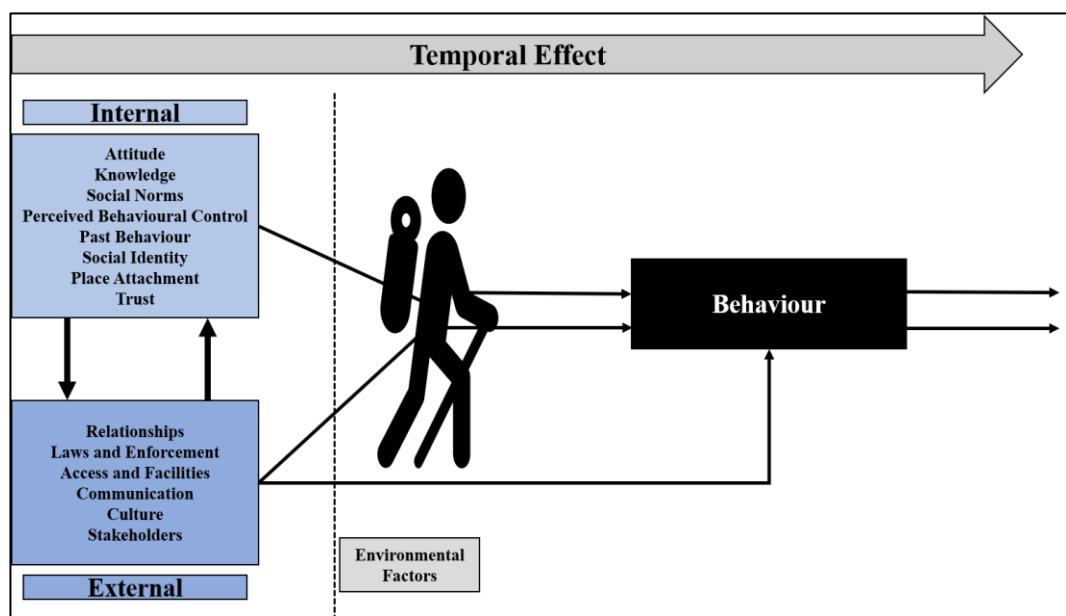
Figure 7.1 Framework illustrating the factors required to engender environmentally responsible behaviour

This intervention was designed as a pilot application of the framework to investigate if elements of the proposed framework could be tailored and applied to a specific goal (outdoor recreation). The intervention revealed some interesting points. For example, the combination of multiple factors into a multi-faceted approach could have a cumulative effect on the participants. The use of active learning allowed for the flow and dissemination of ideas to be fluid. Support for the use of active learning has been documented in the literature and has been discussed in Chapter 2 (Couchman, 2011; Freeman et al., 2014; Torkar, 2014; Derevenskaia, 2014). The use

of active participation and learning has been at the core of a number of Leave No Trace Ireland initiatives. For example, the awareness course described in Section 2.6.3 is designed using the ethos of active learning.

The testing of the intervention was conducted using active learning because of the growing support that this teaching method has in the literature, particularly in the fields of environmental education and STEM (Couchman, 2011; Torkar, 2014; Derevenskaia, 2014; Freeman et al., 2014; Misseyanni et al., 2018). Active learning emphasised the importance of communication between the participants and the researcher which allowed for free thought and the expression of ideas. The participants were empowered with a sense of ownership in the outdoors. The questions that were asked by the participants were answered by the researcher, increasing engagement. The activities encouraged self-reflection without guilt. The importance of communication was clearly evident through the signage activity as well as the co-creation of a message that was tailored to what the participants felt to be the most effective means to increase compliance.

The use of imagery and emotive language was seen to be more effective than the authoritative approach used in the past. The post-intervention surveys revealed a change in attitude in regard to the factors on which the intervention was based. In addition, this change was retained after a month had passed, which suggests that the participants, having time to self-reflect on the intervention, may have internalised aspects of the intervention into their own beliefs.

Furthermore, the testing of this framework reinforces the thoughts and observations of both sets of expert interviews in Phase 2 and 3 of this research. The importance of

communication, emotional connection, and ownership identified throughout Chapters 4 and 5 were found to be relevant in the outcomes of the intervention. Going forward, the use of active learning and communication strategies will be instrumental in the development of effective behavioural change interventions in the context of outdoor recreation and activity tourism.

7.4 Recommendations for Policy Creation

Based on the results of this research, a number of recommendations for policy creation are proposed. It would be prudent for policymakers and NGOs to consider these recommendations, especially considering the increased awareness of environmental issues that require urgent attention both nationally and internationally. The recommendations are outlined below:

- This thesis demonstrated the value of informed, theory-based behavioural interventions. On this basis, future policy needs to be based on a solid foundation of information and research. For example, an overarching, unified research organisation should be developed with co-operation from third level institutes, public bodies and private organisations in order to deliver clear, evidence-based policy recommendations.

- This research revealed the importance of factors such as social identity and culture. Accordingly, policies need to incorporate the social identities of the target population in the design of future interventions. For example, the developers of Greenways and Blueways in Ireland need to show consideration to the long held agrarian culture in their efforts to address the backlash from private landowners in Ireland.

- The effective use of signage and imagery, such as signage deterring littering, emerged as important factors in this research. On this basis, policy developers need to dedicate resources to the design and dissemination of information in order to improve compliance with desired behavioural practices. For

example, although Fáilte Ireland has recommended the introduction of signage in previous reports on visitor management, guidance on the appropriate language, design, placement and frequency is underdeveloped.

- This research demonstrated the importance of collaboration and networking. Accordingly, these factors must be considered in the creation of policy to promote and inspire a singular ethos of environmentalism. Some examples of developed networks exist in Ireland such as Leave No Trace Ireland who are working with a huge range of stakeholder groups in order to achieve their objectives. However, many organisations are working with the silo mentality without an overarching commitment to co-operation.

- This thesis demonstrated the need for ongoing evaluation, reflection and adaptation in the development of behavioural interventions. The creation of policy must increase emphasis towards evaluation, publishing and adaption in the future. A notable example can be seen in the Outdoor Recreation Plan produced by Coillte (2017); progress reports on the efficacy of this initiative need to be published with more frequency to identify and rectify any unforeseen issues.

7.5   Recommendations for Practical Application

The findings of this research must be incorporated into the future design and implementation of behavioural interventions. These findings arose through the analysis of four distinct methodologies, including interviews with both tourism and recreational experts as well as experts in behavioural change. In the context of the practical application of behavioural interventions, the following recommendations should be considered:

- This framework should serve as a foundation upon which an intervention is designed. For future initiatives, consultation with this framework is recommended as it both incorporates established behavioural theory and is

specifically tailored to the context of outdoor recreation.

- This thesis demonstrated the importance of effective communication strategies. On this basis, interpretative language and the use of imagery needs to be incorporated into the design of signage. Leave No Trace has successfully incorporated interpretative signage in their interventions in the United States and organisations such as the NPWS and OPW need to consider this in the future.

- The delivery of environmental messages emerged as an important factor in this research. Accordingly, the use of multiple communication mediums such as info-graphs, video clips and social media marketing should be adopted in the promotion of environmental messaging. A notable example can be seen in the strategy employed by Leave No Trace Ireland, who disseminate aspects of their work across multiple platforms of communication in order to reach a broader target audience.

- This research demonstrated the value of community-led initiatives and co-operation in the design and delivery of behavioural interventions from an Irish context. This calls for more collaboration between governmental, environmental and local organisations. A notable example can be seen with the Leave No Trace Ireland pilot initiative in Donegal, which focuses on collaboration and co-creation with the local community.

- Active Learning was an effective tool in this research. The use of active learning in the delivery of environmental education programmes will be essential to future success. A notable example supporting active learning includes the Learning about Forests Programme, which is run by the Environmental Education Unit of An Taisce.

- The dissemination and communication of research was a focal point of this thesis. On this basis, there needs to be a significant increase in cross-pollination between the sectors of academia, industry and policy makers. For

example, conferences and forums which are relevant to each sector should be utilised.

- This research established the value of multistage testing and evaluation. On this basis, multistage testing of interventions needs to be incorporated into future initiatives. For example, Dublin Bay Biosphere need to incorporate multistage testing to evaluate the efficacy of methods used to address the reported issues regarding dog walkers and nesting birds.

- This research demonstrated the value of supplementing education with the effective use of regulation in regard to behavioural change. On this basis, rigorous enforcement and more severe punishments need to be introduced when indirect management strategies, such as education, are unsuccessful in changing behaviour. For example, Germany, uses education, as well as a well-organised and cheap public transport system, in addition to strict enforcement, in order to increase compliance with ticket purchasing.

7.6   Recommendations for Future Research

This research is the first of its kind to explore, investigate and design a behavioural change framework for the context of outdoor recreation in Ireland. There are a number of recommendations for future research that stem from this research. The recommendations are outlined below:

- This thesis evidences the importance of replication and evaluation in research. Accordingly, replication of this research, in a range of contexts, needs to take place by both this researcher and others. For example, a second population of respondents, in addition to a longer gap between surveys, could produce viable and workable data regarding knowledge retention.

- Social norms are a subtle, yet significant influencer of behaviour. Future research needs to investigate the effect of social norms on other determinants

of behavioural intention. For example, do social norms influence the expression of environmental attitude and if so, how can this be addressed.

- This research previously noted the ambiguity in the use of theory during intervention design. On this basis, future research, if using a behavioural theory, needs to identify and justify the level of adherence to a behavioural theory in the design of an intervention.

- The importance of using research from other countries emerged throughout this thesis. Accordingly, more comparative analysis of the applications of the proposed framework in other countries will aid in understanding the difficulties regarding the transference of research across cultural boundaries. For example, some similar work has been done in the US which creates an ideal opportunity for a collaborative study.

- The inclusion of recreationist observation would also add weight to the research, which is acknowledged as a possible limitation due to the lack of time and funding for this research. Future research using this framework needs to incorporate the use of observation in the testing of the framework. A notable example can be seen in the US, where observational data was used to examine the efficacy of messaging and direct management actions to reduce undesignated trail usage.

- The longitudinal effect of behavioural interventions emerged as a significant factor in this thesis. A future intervention, which is continuously retested over a number of years needs to be conducted to examine the effect of time in the development of behavioural intentions and the changing influence of framework factors.

7.7 Self-Reflection

The temporal component discussed in this research has significant relevance to the researcher, who has undergone significant changes over the last 4–5 years. The researcher's previous academic career proved to be a strength and a barrier to this

research. The researcher had previously graduated from UCD with an Honours degree in Zoology. The science-heavy background made the acquisition of new skills a daunting but exciting aspect. This research allowed the researcher to further develop skills that had been gained previously as well as gaining new skills in regard to research techniques, presentation and communication. The researcher gained an excellent working relationship with Leave No Trace Ireland during the course of this research. The organisation supplied the researcher with ample support and guidance and facilitated attendance at a number of events on behalf of Leave No Trace Ireland. The researcher has presented the findings of this research to a number of Leave No Trace Ireland stakeholders at various intervals and has had the opportunity to receive feedback regarding the emerging findings. The researcher became a member of the Leave No Trace Ireland Research group, which is a network of independent researchers who provide advice and support to others in the network. During his tenure, the researcher has become a trainer for Leave No Trace Ireland and has assisted and led a number of training programmes to a range of client groups, including the Office of Public Works. The researcher has presented aspects of this research to several national and international conferences, including:

- International Adventure Conference 2016
- Sea, Land & Spirit Conference 2017
- 4th Nature & Sports Euro' Meet 2017 in La Seu d'Urgell 2017
- Tourism and Hospitality Research in Ireland Conference (THRIC) 2018
- Ireland's Association of Adventure Tourism (IAAT) Conference 2018
- Adventure Travel Trade Association conference in Bournemouth 2019.

In addition, the researcher has tailored aspects of his research to suit non-academic audiences and has disseminated aspects of his findings to a number of non-academic venues, these include:

- Iveragh Learning Landscapes, both in 2017 and 2018

- Visitor Safety Group Managing Informal Mountain Bike Trails Workshop.

The need to increase transparency and effectual communication of research is of critical importance to the researcher. This research proved to be extremely interesting. The researcher has developed an enthusiasm to continue researching in this field in the future. Although every effort was made to mitigate the risks of bias in the data collection and analysis by the researcher, with the benefit of hindsight, a few minor changes to the questionnaire would have increased efficiency in survey completion and may have improved the quality of answers.

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Appendices

Appendix A: Phase 1 Survey (amended to comply with thesis formatting)

Outdoor Recreation Survey

No.1 How do you feel about the following statements? *(Please mark one answer on each row)*

Statement	Strongly disagree			Neutral/ Don't Know			Strongly agree
Orange peels take several years to decompose	1	2	3	4	5	6	7
The balance of nature is very delicate and easily upset	1	2	3	4	5	6	7
Collecting leaves or flowers is OK in moderation	1	2	3	4	5	6	7
Dog poop is natural and doesn't harm the environment	1	2	3	4	5	6	7
Humans were not meant to rule over the rest of nature	1	2	3	4	5	6	7
When a trail is muddy walking beside the trail is OK	1	2	3	4	5	6	7
Leaving food scraps is Ok because animals need to eat	1	2	3	4	5	6	7
We are approaching the limit of the number of people the earth can support	1	2	3	4	5	6	7

Humans have the right to modify the natural environment to suit their needs	**1**	**2**	**3**	**4**	**5**	**6**	**7**

No.2 How appropriate or inappropriate are the following activities?

(Please mark one answer on each row)

Statement	Absolutely inappropriate			Neutral			Absolutely appropriate
Arriving unprepared to experience the real wilderness	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Scheduling my trip during quiet times to reduce impact on the environment	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Carry all litter back out, leaving only food scraps	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Travel off trail to experience the natural environment	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Go to the toilet in a lake, river or stream if there are no public facilities	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Keep a single item like a rock, plant, stick or feather as a souvenir	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Move rocks and/or logs to make a resting location more comfortable	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Take a break along the edge of a trail	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Drop food on the ground to provide wildlife with a food source	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Approach wildlife to take a photo	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Walk through muddy spots on the trail	**1**	**2**	**3**	**4**	**5**	**6**	**7**

No.3 Do you think the following activities would reduce negative impacts to the environment? *(Please mark one answer on each row)*

Statement	Strongly disagree			Neutral/ Don't know			Strongly agree
Prepare for all types of weather, hazards, or emergencies before heading out	1	2	3	4	5	6	7
Clean up somebody else's rubbish	1	2	3	4	5	6	7
Schedule trip to avoid times of high use	1	2	3	4	5	6	7
Stay on designated or established trails	1	2	3	4	5	6	7
Walk through a muddy trail or puddle	1	2	3	4	5	6	7
Carrying out litter like plastic bottles and packaging	1	2	3	4	5	6	7
Not removing objects from the area, even small items like a rock, plant, stick, or feather	1	2	3	4	5	6	7
Clean up after another person's dog	1	2	3	4	5	6	7
Not approaching, feeding, or following wildlife	1	2	3	4	5	6	7
Take breaks away from the trail and other visitors	1	2	3	4	5	6	7
Taking away food scraps like crumbs, fruit peels and cores	1	2	3	4	5	6	7

No.4 How difficult would each of these activities be for you to do?

(Please mark one answer on each row)

Statement	Very difficult			Neutral			Very easy
Prepare for all types of weather, hazards, or emergencies before heading out	1	2	3	4	5	6	7
Clean up somebody else's rubbish	1	2	3	4	5	6	7
Schedule trip to avoid times of high use	1	2	3	4	5	6	7
Stay on designated or established trails	1	2	3	4	5	6	7
Walk through a muddy trail or puddle	1	2	3	4	5	6	7
Carrying out litter like plastic bottles and packaging	1	2	3	4	5	6	7
Not removing objects from the area, even small items like a rock, plant, stick, or feather	1	2	3	4	5	6	7
Clean up after another person's dog	1	2	3	4	5	6	7
Not approaching, feeding, or following wildlife	1	2	3	4	5	6	7
Take breaks away from the trail and other visitors	1	2	3	4	5	6	7
Taking away food scraps like crumbs, fruit peels and cores	1	2	3	4	5	6	7

No.5 Have you ever heard of Leave No Trace Ireland?

Yes ☐   *No* ☐

No.5b If you have heard of Leave No Trace could you please indicate where you heard of it?

Website	Publications	Event you attended	Media outlet

No.6 If you answered yes how would you describe your current knowledge of "Leave No Trace" practises? *(Please mark one)*

Not at all familiar	Slightly familiar	Somewhat familiar	Moderately familiar	Extremely familiar

No.7 Regarding environmentally responsible behaviour (ERB), how do you feel about the following statements? *(Please mark one answer on each row)*

Statement.	Strongly disagree			Neutral			Strongly agree
Sometimes it's difficult to practise (ERB)	1	2	3	4	5	6	7
Practising (ERB) takes too much time	1	2	3	4	5	6	7
My actions don't matter if others don't behave responsibly	1	2	3	4	5	6	7
Practising (ERB) effectively protects the environment so that future generations may enjoy it	1	2	3	4	5	6	7
Other people's opinions have no effect on my practising (ERB)	1	2	3	4	5	6	7
Practising (ERB) violates the rights of individuals to do as they like in the outdoors	1	2	3	4	5	6	7
If I learned that my actions had damaged the environment, I would change my behaviour	1	2	3	4	5	6	7
I practise (ERB) because the people I recreate with believe it is important	1	2	3	4	5	6	7
Practising (ERB) doesn't reduce the environmental damage caused by other types of land use	1	2	3	4	5	6	7
I practise (ERB) because the law says I should	1	2	3	4	5	6	7
I get upset when I see other individuals are not following (ERB)	1	2	3	4	5	6	7

No.8 How do you feel about the following statements? *(Please mark one answer on each row)*

Statement	Strongly disagree			Neutral			Strongly agree
Donating money or giving time to an environmental organisation is a worthy cause	1	2	3	4	5	6	7
There are more important things to do in life than protect the environment	1	2	3	4	5	6	7
Joining community clean-up efforts helps the environment	1	2	3	4	5	6	7
It is just too difficult for someone like me to do much about the environment	1	2	3	4	5	6	7
Buying products packaged in containers that can be recycled or reused reduces waste	1	2	3	4	5	6	7
Getting my food from local sources is better for the environment	1	2	3	4	5	6	7
Many of the claims about environmental threats are exaggerated	1	2	3	4	5	6	7
Environmentally friendly products actually make a difference	1	2	3	4	5	6	7
Conserving water by turning off the tap while washing dishes has no impact on the environment	1	2	3	4	5	6	7
Turning off lights if I am leaving a room for more than 10 minutes doesn't reduce energy consumption	1	2	3	4	5	6	7

There is no point in doing what I can for the environment unless others do the same	1	2	3	4	5	6	7
I do what is right for the environment, even when it costs more money or takes more time	1	2	3	4	5	6	7

No.9 How trustworthy do you think each of the following groups are to give you correct information about causes of pollution? *(Please mark one answer on each row)*

Organisation	Very trustworthy		Neutral				Very Untrustworthy
Business and industry	1	2	3	4	5	6	7
Environmental groups	1	2	3	4	5	6	7
Government departments	1	2	3	4	5	6	7
Newspapers	1	2	3	4	5	6	7
Radio or TV programmes	1	2	3	4	5	6	7
University research centres	1	2	3	4	5	6	7

No.10 What age are you?

18-24	25-31	32-38	39-46	47-54	55-62	63+

No.11 Are you Male/Female?

Male ☐   *Female* ☐

No.12 Please state your nationality.

_____

No.13 What is the highest level of education you have completed?

Primary level   _____

Some Secondary school   _____

Completed secondary level   _____

Some third level   _____

Completed third level   _____

Completed Postgraduate studies   _____

No.14 Do you live in Ireland?

Yes ☐   *No* ☐

No.15 Are you staying away from home overnight to visit this area?

Yes ☐   *No* ☐

No.16 Please indicate the type of location in which you live? *(Please tick one)*

Rural (Driving distance from nearest village or town) _____

Village/Small Town _____

Medium/Large town _____

City _____

No.17 Which of the following activities have you engaged in? *(Tick as many as apply)*

	Today	In the Last Month
Walking/Hiking		
Fishing		
Dog Walking		
Visit National Park		
Cycling		
Swimming		
Rock climbing		

Spectating		
Camping		
Sailing		
Surfing/Windsurfing		
Snorkelling		
Mountain Biking		
Scuba diving		
Canoeing		
Picnicking		
Kayaking		

If I have missed any activities, please write them down here:

_____

Thank you for your Time

Appendix B: Phase 2 Interview Topics

Interview Topics

- What do you know about Leave No Trace Ireland (LNT)?
    - What do you think of LNT as an organisation
    - What is your experience with LNT

- In your opinion what is the current level of environmental knowledge among recreational users, particularly in regards to LNT
    - Scale of (1-5)?

- Do you think behaviours exhibited by recreationists are an accurate reflection of their knowledge?

- What are the major environmental impacts that are affecting the area?
    - What is the worst?

- What Environmental Impact management approaches have you used and have you found it effective.

- In your view, what would be the best ways to encourage positive recreational behaviours?

- What would be the main challenges that face in the implementation of these methods?

- In your opinion, is there a demographic group of people who seem to be the worst offenders for environmental impacts?
    - Is there a particular activity that can also be attributed to having the worst impact?
    - Conversely, is there a group/ activity that is the most compliant?

- What major environmental project have you worked on recently (within the last 12 months) and why have you identified it as important?

- Has your organisation's reputation affected the implementation of any of your projects?

- Have you anything to add?

Appendix C: Phase 2 Coding

1.5.1 Open Coding

Name	Sources	References
Attitude	7	123
Demographic Group	7	36
Main Challenges To the implementation to these methods	7	18
Reputation	5	14
Apathy	6	22
Attitude Vs Action	2	3
Numbers of Recreationists	6	30
Knowledge	7	175
Behaviour's Exhibit Knowledge	7	16
Management Approaches Used	6	29
Environmental Awareness	7	53
Knowledge Levels of Recreational Users	4	14
Education	7	37
Conflict	6	20
Conservation	6	15
Major Project	7	13
Other Countries Examples	4	8
Training	6	18
Social Norms	7	150
Encourage Positive Behaviour	7	31
PBC	7	135
Main Environmental Impacts	7	39
Erosion	1	2
Communities & Groups	7	28

1.5.2 Thematic Coding

Name	Sources	References
LNT Relationship	7	30
Major Project	7	13
Responsibility	6	17
Knowledge Levels of Recreational users	4	14
o Behaviour's Exhibit knowledge	7	16
Main Environmental Impacts	6	39
Management Approaches Used	7	29
o Encourage Positive Behaviour	7	34
Main Challenges To the implementation to these Methods	6	18
o Demographic Group	7	36
o Reputation	7	14
o Education	7	37
o Conservation	6	15
o Environmental Awareness	6	53
o Apathy	6	22
o Conflict	9	20
o Training	6	18
o Funding	4	11

o Resources	5	12
Network & Communication	7	53
o Stakeholders	8	28
Attitude Vs Action	2	3

Appendix D: Phase 3 Interview Topics

Themes

- What is the most significant negative environmental impact (Challenge) that you face in your organisation? What is the largest/most recent project that you are working on now.
    - How is it caused
    - Why
    - How does it affect your field?
    - Who are the worst perpetrators?
    - How long has it been an issue?

Intervention Design.

- What approach have you used to date to tackle the problem?
    - Why
    - When
    - Who did you target
    - How did you implement the intervention?
    - How did you design your intervention?
    - Was it theory based

Evaluation of Intervention

- Has there been any feedback on the impact of the programme/intervention.

- What was your biggest challenge that you have dealt with to date.

- Would you have done anything differently if you could begin again?
    - Why

- When dealing with behaviour change, what has been the biggest learning point from when you started your work, to where you are now?

- Did anything surprise you when undertaking a behavioural change?
    - What
    - Why
- Any Further Plans to Build on what you have done?

Curve Balls

- Would you have any advice that you could give me on how to begin with my own intervention.
- What do you think is the most effective way to change behaviour?
    - Why
- What about Ireland
- Do you recreate in the outdoors?
    - What annoys you
    - How would you change that behaviour?

Appendix E Phase 3 Coding

1.5.3 Open Coding

Name	Sources	References
Age	6	3
Application	4	9
Biggest Challenge	7	49
Communication	7	62
Community	6	33
Co-operation	6	26
Failure	4	11
Feedback	5	28
Freedom---Rights	5	14
Future Work	6	16
Head and Heart	4	20
Human Behaviour	4	8
Ireland	6	29
Lessons Learned	7	31
Life Cycle of a Recreational Experience	2	6
Main Actions to Change Behaviour	7	52
Recent Campaign	7	37
Social Identity	5	18
Social Media	2	15
Subjective	3	9
Theory Based	5	18
Time	5	11
What Annoys Respondents	6	23
What is the Main Environmental Impact That You Face in Your Organisation	7	35
Worst Offenders	3	8

1.5.4 Thematic Coding

Name	Sources	References
Access and Facilities	9	47
o Intervention Justification	6	11
Stakeholder Identification	3	5
Social Identity	5	18
Culture	9	45
How to Change Behaviour	9	6
Communication	11	93
o Imagery	4	15
o Language Used	10	27
o Personal	7	10
o Social Media	1	1
o Statistics	4	6
Education and Emotion	13	64
o Head and Heart	6	23
Law and Enforcement	12	30
o Consequences	5	23

o Failure in Execution	4	7	
o Freedom	7	19	
o Paternalism	9	31	
o Nudge	6	4	
Place Attachment	7	15	
Relationships	6	9	
o Community	9	32	
o Conflict	6	22	
o Co-operation	12	54	
o Trust	9	12	
Intervention Experience	8	31	
o Theory, Feedback and Evaluation	7	21	
o Failure	5	4	
o Feedback	6	9	
o Observation	4	3	
o Theory Based	5	18	

Appendix F: Phase 4 Survey (amended to comply with thesis formatting)

T-Number:

How do you feel about the following statements? *(Please mark one answer on each row)*

Statement	Strongly Disagree			Neutral/ Don't Know			Strongly Agree
There is a place I like in which I recreate quite a lot	1	2	3	4	5	6	7
I get upset when I see other people's rubbish while I am out recreating	1	2	3	4	5	6	7
Collecting leaves or flowers is OK in moderation	1	2	3	4	5	6	7
I do not care what other people do in the outdoors as long as it doesn't involve me	1	2	3	4	5	6	7
I see myself as part of a community when I recreate	1	2	3	4	5	6	7
I have the right to use public land as I see fit	1	2	3	4	5	6	7
Many of the claims about waste pollution are exaggerated by the media	1	2	3	4	5	6	7
Restrictive signs posted in areas can really hinder my enjoyment of the outdoors	1	2	3	4	5	6	7
Leaving food scraps is Ok because animals need to eat	1	2	3	4	5	6	7

Statement	Strongly Disagree			Neutral/ Don't Know			Strongly Agree
Picking up after other people is pointless and disgusting	1	2	3	4	5	6	7
Banana peels can take several years to breakdown	1	2	3	4	5	6	7
Cigarette butts break down quickly because they are made of paper	1	2	3	4	5	6	7
It is just too difficult for somebody like me to do much for the environment	1	2	3	4	5	6	7
I read signs/notices when I come across them in the outdoors	1	2	3	4	5	6	7
I find signs and notices to be interesting and informative, they help me make decisions about my behaviour	1	2	3	4	5	6	7
There is no point doing what I can for the environment unless others do the same	1	2	3	4	5	6	7
My actions while I am out recreating do not affect the environment	1	2	3	4	5	6	7
I do not pay attention to other people when I am recreating	1	2	3	4	5	6	7
If I learned that my actions damaged the environment, I would change my behaviour	1	2	3	4	5	6	7
Other people create a huge mess in the outdoors, it is not my responsibility to clean up after them	1	2	3	4	5	6	7
I clean up my rubbish in the outdoors, leaving only food scraps	1	2	3	4	5	6	7
The area where I recreate has a lack of facilities e.g. and that is the cause of a lot of issues like littering	1	2	3	4	5	6	7
There is a lot of misinformation published. It is hard to know what is the right thing to do in the outdoors	1	2	3	4	5	6	7

Statement	Strongly Disagree			Neutral/ Don't Know			Strongly Agree
Other types of land use are more harmful than mine	1	2	3	4	5	6	7
It is ok to move rocks and logs to make an resting area more comfortable	1	2	3	4	5	6	7
I dislike when other people are making noise while I am recreating	1	2	3	4	5	6	7
I behave responsibly in the outdoors because the law says I should	1	2	3	4	5	6	7
If there is a puddle on a trail, walking beside the trail is fine.	1	2	3	4	5	6	7

THANK YOU

Appendix G: Attitude Scoring Among Age Demographics

Age Group	Descriptive	Statistic	Std. Error
18–24 (n = 18)	Median	81	
	Std. Deviation	14	
	Minimum	50	
	Maximum	94	
	Range	44	
	Interquartile Range	20	
	Skewness	-.772	.536
	Kurtosis	-.614	1.038
25-31 (n = 29)	Median	87	
	Variance	161	
	Std. Deviation	13	
	Minimum	43	
	Maximum	100	
	Range	57	
	Interquartile Range	14	
	Skewness	-1.471	.434
	Kurtosis	2.616	.845
32–38 (n = 52)	Median	86	
	Variance	90	
	Std. Deviation	10	
	Minimum	61	
	Maximum	99	
	Range	37	
	Interquartile Range	13	
	Skewness	-.928	.337
	Kurtosis	.187	.662
39–46 (n = 37)	Median	83	
	Variance	82	
	Std. Deviation	9	
	Minimum	61	
	Maximum	100	
	Range	39	
	Interquartile Range	10	
	Skewness	-.642	.393
	Kurtosis	.700	.768
47–54 (n = 31)	Median	84	
	Variance	140	
	Std. Deviation	12	
	Minimum	57	
	Maximum	100	
	Range	43	
	Interquartile Range	19	
	Skewness	-.466	.427
	Kurtosis	-.911	.833
55–62 (n = 17)	Median	89	
	Variance	305	
	Std. Deviation	18	
	Minimum	37	
	Maximum	96	
	Range	59	

	Interquartile Range	20	
	Skewness	-1.053	.580
	Kurtosis	.108	1.121
63+ **(n = 15)**	Median	69	
	Variance	284	
	Std. Deviation	17	
	Minimum	44	
	Maximum	100	
	Range	56	
	Interquartile Range	26	
	Skewness	.110	.637
	Kurtosis	-.439	1.232

Appendix H: Attitude Scoring Among Education Demographics

Educational Group	Descriptive	Statistic	Std. Error
Primary (n = 6)	Median	71	
	Variance	272	
	Std. Deviation	17	
	Minimum	50	
	Maximum	89	
	Range	39	
	Interquartile Range	32	
	Skewness	-.227	.913
	Kurtosis	-2.036	2.000
Secondary (n = 7)	Median	65	
	Variance	184	
	Std. Deviation	14	
	Minimum	44	
	Maximum	86	
	Range	41	
	Interquartile Range	18	
	Skewness	-.132	.845
	Kurtosis	1.419	1.741
Some College but No Degree (n = 32)	Median	80	
	Variance	172	
	Std. Deviation	13	
	Minimum	37	
	Maximum	100	
	Range	63	
	Interquartile Range	16	
	Skewness	-1.317	.421
	Kurtosis	2.723	.821
Ordinary Degree (n = 50)	Median	83	
	Variance	135	
	Std. Deviation	12	
	Minimum	54	
	Maximum	100	
	Range	46	
	Interquartile Range	16	
	Skewness	-.783	.343
	Kurtosis	-.095	.674
Honours Degree (n = 56)	Median	87	
	Variance	108	
	Std. Deviation	10	
	Minimum	50	
	Maximum	100	
	Range	50	
	Interquartile Range	11	
	Skewness	-1.138	.322
	Kurtosis	1.573	.634
	Median	87	
	Variance	143	
	Std. Deviation	12	
	Minimum	43	

Post-Graduate Qualification (n = 45)	Maximum	100	
	Range	57	
	Interquartile Range	14	
	Skewness	-1.386	.365
	Kurtosis	2.124	.717

Appendix I: Knowledge Scoring Among Education Demographics

Educational Groups	Descriptive	Statistic	Std. Error
Primary (n = 6)	Median	69	
	Variance	114	
	Std. Deviation	11	
	Minimum	54	
	Maximum	77	
	Range	24	
	Interquartile Range	23	
	Skewness	-.479	.845
	Kurtosis	-2.006	1.741
Secondary (n = 7)	Median	61	
	Variance	6	
	Std. Deviation	3	
	Minimum	55	
	Maximum	62	
	Range	7	
	Interquartile Range	4	
	Skewness	-1.442	.794
	Kurtosis	2.080	1.587
Some College but No Degree (n = 32)	Median	67	
	Variance	162	
	Std. Deviation	13	
	Minimum	33	
	Maximum	89	
	Range	56	
	Interquartile Range	18	
	Skewness	-.362	.427
	Kurtosis	.203	.833
Ordinary Degree (n = 50)	Median	63	
	Variance	113	
	Std. Deviation	11	
	Minimum	35	
	Maximum	85	
	Range	50	
	Interquartile Range	18	
	Skewness	-.202	.340
	Kurtosis	-.288	.668
Honours Degree (n = 56)	Median	74	
	Variance	118	
	Std. Deviation	11	
	Minimum	48	
	Maximum	89	
	Range	42	
	Interquartile Range	16	
	Skewness	-.603	.319
	Kurtosis	-.435	.628
	Median	71	
	Variance	136	
	Std. Deviation	12	
	Minimum	25	

Post-Graduate Qualification (n = 45)	Maximum	85	
	Range	60	
	Interquartile Range	13	
	Skewness	-1.721	.361
	Kurtosis	4.184	.709

Appendix J: Social Norms Scoring Among Age Demographics

Age	Descriptive	Statistic	Std. Error
18–24 **(n = 18)**	Median	77	
	Variance	218	
	Std. Deviation	15	
	Minimum	46	
	Maximum	91	
	Range	46	
	Interquartile Range	29	
	Skewness	-.394	.536
	Kurtosis	-1.101	1.038
25-31 **(n = 29)**	Median	86	
	Variance	133	
	Std. Deviation	12	
	Minimum	60	
	Maximum	100	
	Range	40	
	Interquartile Range	17	
	Skewness	-.480	.434
	Kurtosis	-.650	.845
32–38 **(n = 52)**	Median	86	
	Variance	177	
	Std. Deviation	13	
	Minimum	49	
	Maximum	100	
	Range	51	
	Interquartile Range	14	
	Skewness	-.913	.337
	Kurtosis	.303	.662
39–46 **(n = 37)**	Median	86	
	Variance	86	
	Std. Deviation	9	
	Minimum	54	
	Maximum	100	
	Range	46	
	Interquartile Range	11	
	Skewness	-.824	.398
	Kurtosis	1.794	.778
47–54 **(n = 31)**	Median	81	
	Variance	214	
	Std. Deviation	15	
	Minimum	49	
	Maximum	100	
	Range	51	
	Interquartile Range	20	
	Skewness	-.712	.427
	Kurtosis	-.251	.833
55–62 **(n = 17)**	Median	66	
	Variance	199	
	Std. Deviation	14	
	Minimum	37	
	Maximum	97	

	Range	60	
	Interquartile Range	17	
	Skewness	-.169	.580
	Kurtosis	1.642	1.121
63+ **(n = 15)**	Median	73	
	Variance	193	
	Std. Deviation	14	
	Minimum	46	
	Maximum	97	
	Range	51	
	Interquartile Range	21	
	Skewness	-.105	.637
	Kurtosis	.212	1.232

Appendix K: PBC Scoring Among Educational Demographics

Education	Descriptive	Statistic	Std. Error
Primary (n = 6)	Median	70	
	Variance	369	
	Std. Deviation	19	
	Minimum	32	
	Maximum	80	
	Range	48	
	Interquartile Range	29	
	Skewness	-1.110	.845
	Kurtosis	.649	1.741
Secondary (n = 7)	Median	71	
	Variance	99	
	Std. Deviation	10	
	Minimum	54	
	Maximum	86	
	Range	32	
	Interquartile Range	12	
	Skewness	-.024	.794
	Kurtosis	.946	1.587
Some College but No Degree (n = 32)	Median	75	
	Variance	162	
	Std. Deviation	13	
	Minimum	36	
	Maximum	97	
	Range	60	
	Interquartile Range	16	
	Skewness	-.854	.421
	Kurtosis	1.020	.821
Ordinary Degree (n = 50)	Median	78	
	Variance	101	
	Std. Deviation	10	
	Minimum	52	
	Maximum	90	
	Range	38	
	Interquartile Range	17	
	Skewness	-.692	.343
	Kurtosis	-.659	.674
Honours Degree (n = 56)	Median	77	
	Variance	86	
	Std. Deviation	9	
	Minimum	54	
	Maximum	93	
	Range	40	
	Interquartile Range	12	
	Skewness	-.586	.322
	Kurtosis	.009	.634
	Median	79	
	Variance	222	
	Std. Deviation	15	
	Minimum	14	

	Maximum	96	
Post-Graduate Qualification (n = 45)	Range	81	
	Interquartile Range	14	
	Skewness	-2.339	.369
	Kurtosis	7.870	.724