

SEEING GREEN AND BECOMING GREEN: APPLYING NORMATIVE SOCIAL
INFLUENCE TO PROMOTE PRO-ENVIRONMENTAL BEHAVIOUR ACROSS
TWO NEW ZEALAND CONTEXTS

BY

BENJAMIN A. TILYARD

A thesis
submitted to Victoria University of Wellington
in fulfilment of the requirements for the degree of
Master of Science

Victoria University of Wellington
2011

Abstract

Intervention programmes aimed at promoting pro-environmental behaviours typically rely solely on information-only appeals. However, research has shown that information-based interventions do not often lead to behaviour change, instead presenting the use of social norms as a better catalyst for change (see, e.g., Cialdini, 2003; Schultz, 1998; Schultz & Kaiser, forthcoming). The current research adds to a growing body of literature that employs normative influence (information regarding the behaviour commonly conducted by others) to promote pro-environmental behaviour. Two experimental studies compared the effectiveness of normative information with information-only environmental messages. Study 1 used a survey questionnaire to measure participants' self-reports of household energy efficiency and Study 2 used a field experiment to directly measure hotel guests' towel reuse. Results indicated that individuals provided with social norm information engaged in more pro-environmental behaviour than those who were presented solely with environmental information. The findings also suggest that there is a need to distinguish between types of pro-environmental behaviour and the role of social reference groups when designing normative messages. The implications of these findings are discussed along with directions for future research.

Acknowledgements

Firstly, I wish to thank Dr. Taciano Milfont for his supervision over this project. He read through countless drafts and provided many useful comments that benefited not only my writing but also my skills as a researcher. Thank you for your unwavering patience and enthusiasm towards this project.

Thank you to Chelsea Rose, Paul Reddish, and Jenna Tinkle for their excellent feedback and editing skills and to Pollyane Diniz, Alana Cornforth, Camilla Morley, Raquel Perez, and the other members of the environmental lab. I was lucky to have had the opportunity to bounce ideas off of you and to work in such a welcoming and enjoyable environment.

I also wish to thank the staff members of the Wellington hotel that was such an integral part of this research. Thank you for taking part in this research and enabling me to undertake this project. Without your willingness to be involved, this research may never have eventuated.

Thank you to Rosanna for always being there. Thank you for your brainstorming, insightful comments, and your ability to always take the best out of every situation.

Finally, thank you to Mum and Dad for your continual support throughout this year. Knowing that I always had your support made this difficult year all the more easier. I will always be thankful for your encouragement and interest in this project and everything I do.

For granddad.

Table of Contents

Abstract	i
Acknowledgements.....	ii
Table of Contents	iii
CHAPTER ONE: INTRODUCTION	1
Normative influence	5
<i>Descriptive and injunctive norms</i>	<i>7</i>
<i>Situational norm information.....</i>	<i>12</i>
<i>Social reference and group identity.....</i>	<i>13</i>
Normative influence and pro-environmental behaviour.....	16
<i>Household behaviour change</i>	<i>17</i>
<i>Organisational behaviour change</i>	<i>19</i>
The current research	26
CHAPTER TWO: STUDY 1.....	27
Hypotheses.....	28
Method.....	30
Participants.....	30
Procedure.....	31
Measures	31
Normative priming.....	32
Manipulation check.....	33
Willingness to engage in energy efficiency.....	33
Environmental attitudes	35
Results	36
Preliminary analyses	36
Priming manipulation check.....	39
Willingness to engage in energy efficiency.....	41
Energy Efficiency Dimensions	42
NEP scores	43
Discussion.....	47
Self-reported energy efficiency	47
Environmental concern (NEP Scale)	49
CHAPTER THREE: STUDY 2	52
Hypotheses.....	57

Method.....	58
<i>Participants</i>	58
<i>Materials</i>	59
<i>Procedure</i>	61
Results	63
<i>Preliminary analyses</i>	63
<i>Effectiveness of normative messages</i>	66
<i>Effectiveness of the four experimental conditions</i>	68
<i>Effectiveness of utilising reuse messages</i>	70
<i>Consideration of data clustering</i>	71
Discussion.....	72
CHAPTER FOUR: GENERAL DISCUSSION	75
Theoretical implications	77
<i>Dimensions of pro-environmental behaviour</i>	77
<i>Personal norms</i>	78
<i>Social reference group</i>	79
<i>The attitude-behaviour gap</i>	82
<i>New Zealand context</i>	85
<i>The mere exposure effect</i>	86
Practical applications.....	87
<i>Household applications</i>	88
<i>Organisational applications</i>	89
Limitations.....	91
Future research	94
<i>The role of personal norms</i>	94
<i>Reciprocity</i>	95
<i>Intergroup competition</i>	97
<i>Additional pro-environmental factors</i>	98
CHAPTER FIVE: CONCLUSION	100
CHAPTER SIX: REFERENCES	103
CHAPTER SEVEN: APPENDICES	119

CHAPTER ONE: INTRODUCTION

Introduction

Environmental problems are seen by many as the most significant current global problem (Zelezny & Schultz, 2000) and perhaps the greatest challenge to current civilisation (Triandis, 2008). Recently, the Intergovernmental Panel on Climate Change (IPCC; 2007) reported that expected changes in climate will result in significant environmental problems associated with food supply, water resources, and human health. Such global issues can only be solved through widespread recognition and an agreement that they need to be acted upon (Milfont, 2009).

The recent popularity of environmental issues within films (e.g., Al Gore's *An Inconvenient Truth*, 2006) and periodicals (e.g., Kluger, 2006, *Time Magazine*; Miller, 2009, *National Geographic*) is placing increasing pressure on the global community to combat environmental problems, with some success. Initiatives such as carbon-credit or emissions trading schemes and the Kyoto protocol are positive steps towards reducing harm to the environment. However, such initiatives do not target specific behaviours at the individual level, relying instead on government led initiatives at the national level.

Many researchers posit that environmental problems are the result of human behaviour (see, e.g., IPCC, 2007; Thøgersen, 2009). Gardner and Stern (2002) argue that "all of today's regional and global environmental problems are traceable to human actions" (p. 7) and the IPCC (2007) describes human behaviour as a notable cause of global temperature increases since the mid-20th century. As such, the notion of 'environmentalism' is aligned with the concept that environmental problems are social issues and the result of human behaviour (Zelezny & Schultz, 2000; see also Clayton & Myers, 2009). Ultimately, "behaviour change is central to achieving sustainability" (McKenzie-Mohr, 2002, p. 28) with any possible solutions to environmental problems

requiring a change in behaviour (Schultz & Kaiser, forthcoming; see also Midden, Kaiser, & McCalley, 2007). It is therefore imperative that environmental research focuses on finding and developing new ways to promote pro-environmental behaviours.

In order to effectively address pro-environmental behaviour, an appropriate definition must be adopted. Previous research has provided several definitions of pro-environmental behaviour and related constructs. For example, Axelrod and Lehman (1993) defined ecological behaviour as actions which support the preservation or conservation of the environment (see also Kaiser, 1998; Kaiser, Wölfing, & Fuhrer, 1999) and Stern (2000) presented two definitions of environmentally significant behaviour. The first of these defines such behaviour by the impact it has on the availability of environmental resources or the extent to which it alters the ecosystem (see also Stern, 1997). Stern's (2000) second definition views environmentally significant behaviour as responsive to behaviour change and reflects an individual's intention to change the environment, usually with positive environmental outcomes. One further definition is presented by Kollmuss and Agyeman (2002). They termed pro-environmental behaviour as one's efforts to minimise the adverse environmental impacts associated with behaviour. The current research incorporates the above definitions to define pro-environmental behaviour as behaviour that supports the conservation of environmental resources while minimising the negative environmental impacts associated with one's behaviour. Extra weight is given to Stern's (2000) definition which incorporates the role of behaviour change.

Given the influential role of human behaviour on environmental issues, psychological research can guide initiatives that attend to environmental concerns (Milfont, 2010). Behaviour change initiatives can be developed to target specific

behaviours by focusing on the fundamental motivations that underpin individual and group behaviours. Such initiatives may benefit from a greater understanding of attitudes and intentions (Zelezny & Schultz, 2000). In fact, within psychology, the area of environmental values and attitudes has become a major area of study (see, e.g., Milfont & Duckitt, 2010; Schultz et al., 2005; Schultz & Zelenzy, 1999).

Despite the opportunities afforded through such research, the most commonly used method for promoting pro-environmental behaviour continues to be education. Typically, education-based programmes (also termed the knowledge-deficit model of behaviour change; see, e.g., Schultz, Khazian, & Zaleski, 2008) uphold the mantra of “people just need to be educated”, often presenting factual information concerning the frequency of behaviours that are detrimental to the environment (Schultz, Khazian, & Zaleski, 2008; see also Schultz, 2002). Contrary to their frequency, education-based information campaigns are often ineffective because they tend to overlook the underlying motives behind behaviour (Schultz & Kaiser, forthcoming; Schultz, Khazian, & Zaleski, 2008) and therefore have little effect on behaviour change (Abrahamse, Steg, Vlek, & Rothengatter, 2005; Gardner & Stern, 2002; Geller, 2002a; Geller, 2002b; McKenzie-Mohr, 2002). More effective initiatives are those that consider the motivation behind human behaviour (see, e.g., Cialdini, 2003, 2007; Griskevicius, Cialdini & Goldstein, 2008; Schultz, Khazian, & Zaleski, 2008). One potential source of this motivation is social norms (Schultz, 1998).

Before discussing the role of social norms, it is important to distinguish between two types of social influence – informational and normative. Informational influence refers to individuals using others as a guide for their own behaviour. It is an important process to counteract behavioural uncertainty or social disagreement. In contrast, normative influence is a pressure to obey the social expectations of others

(see Deutsch & Gerard, 1955; Göckertiz et al., 2010; Vaughan & Hogg, 2005). The current research is predominantly concerned with normative social influence. The knowledge of how others behave and what they approve of is believed to be a positive way of initiating and motivating behaviour change, particularly within the realm of environmental behaviour (Nolan, Schultz, Cialdini, Goldstein & Griskevicius, 2008).

Normative influence

Individuals learn ways of behaving that are characteristic of the social settings they are in, sourcing information from how others behave and what behaviours are socially accepted or supported. This information comes in the form of social norms. Bendor and Swistak (2001) posit that social norms are behavioural rules reinforced by social sanctions that operate regardless of the number of individuals involved in any behavioural interaction. It is precisely this interaction that permits the existence of social norms: they are the result of communication between individuals (Rimal & Real, 2003). As such, social norms are sets of beliefs pertaining to the behaviour of others and what they approve of doing (Cialdini, Reno, & Kallgren, 1990; Schultz, Tabanico, & Rendón, 2008). Although actively witnessing the behaviour of other people provides social norm information for a given context, social interaction is not always required. Instead, this behavioural knowledge can be communicated through other means such as banners, billboards, or even a full rubbish bin in a public park (see, e.g., Schultz, Tabanico, & Rendón, 2008).

Regardless of the source, the information contained in social norms has a significant effect on the decisions individuals make concerning their own behaviour (Bosari & Carey, 2001; Cialdini & Trost, 1998) as people often perceive behaviour as correct for a given context if they see others engaging in a given action (Cialdini,

2001). This knowledge then becomes easily accessed to guide and adjust behaviour when required (Aarts & Dijksterhuis, 2003), serving as a simple strategy for preserving cognitive resources (Göckeritz et al., 2010).

One study that demonstrates the useful application of normative information was conducted by Nolan et al. (2008). In their study, household energy conservation was significantly influenced by normative appeals. Compared to messages that relied on environmental protection, social responsibility, or self interest, a message describing the energy conservation of one's neighbours had the greatest effect on encouraging energy conservation. Regardless of research that exhibits results such as these, individuals give little thought to the notion that social norms influence their own behavioural choices (see, e.g., Cialdini, 2005; Cialdini, 2007; Clayton & Myers, 2009; Griskevicius et al., 2008; Nolan et al., 2008). Since people do not recognise this influence, marketers and policy developers fail to implement behaviour change initiatives that would prove highly effective (Griskevicius et al., 2008), focusing instead on education-orientated programmes.

Clayton and Myers (2009) argue that social norm information is advantageous for two reasons: (1) Individuals can take advantage of the knowledge that others have through imitating their behaviour; and (2) people tend to reward those who behave in similar ways to themselves (see also Cialdini, 2001; Rimal, Lapinski, Cook, & Real, 2005). Despite these positive outcomes that accompany norm obedience, social norms should not be understood as constantly influencing and guiding behaviour. Norms only motivate behaviour when they are activated or made salient (Cialdini et al., 1990).

For example, Kallgren, Reno and Cialdini (2000) reported that across several conditions of normative focus (e.g., public versus private settings; modelled and self-directed behaviours), participants' behaviour only conformed to the expectations of

normative influence when such information was made focal. This norm salience is a crucial aspect of Cialdini and colleagues' (1990) norm focus / norm activation model, which states that a particular social norm is unlikely to influence behaviour unless it is salient at the time a behavioural decision is made. Take, for instance, a sign placed at a water cooler. More individuals would be motivated to reuse their own cups if informed that other people engage in such behaviour. Because this information is placed at the location of decision making, it would be expected to have a much greater effect on behaviour than if it were placed somewhere else in the office. Ultimately, normative information must be relevant to specific behaviour(s) and within close proximity to the setting in which such behaviour takes place.

Previous research investigating normative influence typically encompasses three major elements: (1) Injunctive and descriptive social norms; (2) situational norm information; and (3) social reference or group identity. These three elements of normative information will be discussed below.

Descriptive and injunctive norms

The term 'norm' can refer to one of two typical definitions: (1) behaviour that is commonly conducted; and (2) the degree of social approval associated with a behaviour (Kallgren et al., 2000). In accordance with these definitions, Cialdini et al. (1990) posited that these types of norms should be respectively referred to as descriptive and injunctive norms.¹

¹ Although injunctive norms closely align with normative social influence, descriptive norms can be both normative and informational. Consistent with the research of Göckeritz et al. (2010), the current research treats both types of norms as normative social influence. For a greater discussion of the distinction between normative and informational social influence, see Schultz, Tabanico and Rendón (2008).

Descriptive social norms motivate public and private behaviour by demonstrating to individuals what conduct is effective within a particular situation or context (Cialdini, 2007; Cialdini et al., 1990; Goldstein, Cialdini, & Griskevicius, 2008). Acting as a decisional shortcut (Cialdini, 2001), descriptive norms describe what is typical within the specific setting by highlighting what behaviours are effective and adaptive (Cialdini et al., 1990; White, Smith, Terry, Greenslade, & McKimmie, 2009). Descriptive social norms provide a behavioural standard from which people do not want to deviate (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007), since such deviation would oppose behaviour modelled as well-suited (i.e., adaptive and conventional) to a specific context.

Cialdini and colleagues (1990; Study 1) investigated the role of descriptive normative influence on individuals' tendency to litter. Participants were placed in one of several conditions manipulated by the behaviour of a confederate and the presence of litter (i.e., confederate litters in a clean / littered environment; confederate does not litter in a clean / littered environment). Participants' littering behaviour was then analysed. Consistent with predictions, participants littered more after watching a confederate litter in an already littered environment. Littering behaviour increased with the knowledge that littering was a frequently conducted behaviour (see Figure 1).

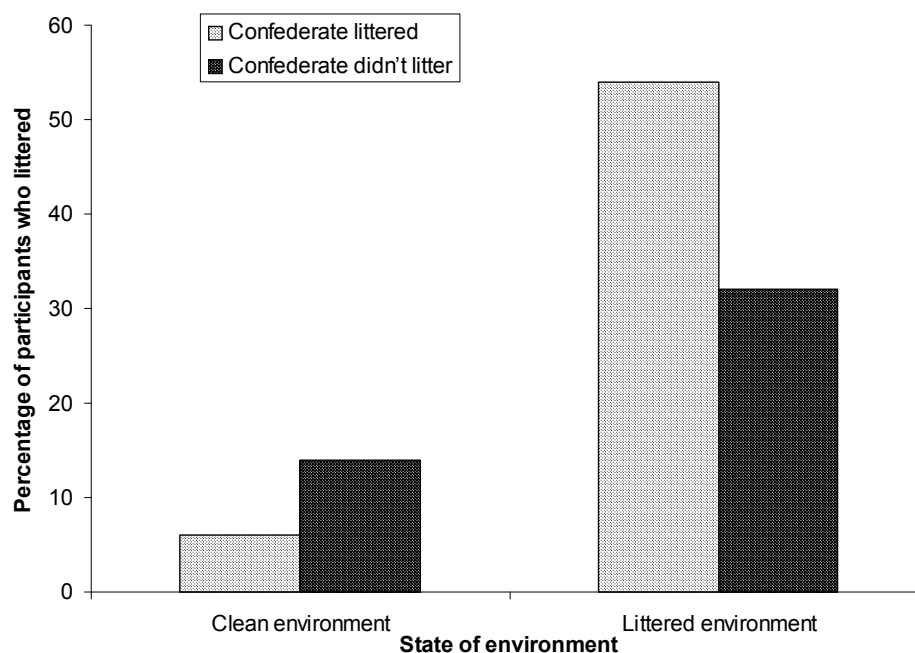


Figure 1. Percentage of participants who littered based on contrasting descriptive normative information (source: Cialdini et al., 1990; Study 1).

Behaviour change research such as this highlights the influential power of descriptive social norms: Individuals become highly motivated to engage in a particular behaviour when it is perceived as frequently conducted by others. However, it is not solely the frequency of observed behaviour that results in the power of social norms. A second level of influence stems from injunctive social norms, termed by Cialdini et al. (1990) as behaviour that ‘ought’ to be conducted.

Injunctive social norms impose guidelines for one’s behaviour by introducing social sanctions (Cialdini et al., 1990; Lapinski & Rimal, 2005). These sanctions incorporate an individual’s beliefs about the social approval afforded to a specific behaviour, consequently motivating action by enlightening individuals of the social rewards (or punishments) associated with relevant behaviours (White et al., 2009). The

social approval associated with a particular behaviour can come from several sources including friends, family members, acquaintances, or even strangers (Cialdini, 2007).

No matter the source, social approval (or lack thereof) plays a significant role in an individual's behavioural decision making. For example, several studies have shown a strong association between injunctive social norms and students' drinking behaviour. In one such study, Larimer, Turner, Mallett and Geisner (2004) reported a strong link between the social approval of heavy drinking and students' drinking behaviour. The findings indicated that injunctive social norm information (i.e., the level of social approval associated with drinking) helped to explain participants' current drinking behaviour. Consistent with several other studies, the injunctive norm measure was also identified as a significant risk factor for present and future alcohol-related problems, particularly when associated with the consequences of engaging in heavy drinking (see also, Sher, Bartholow & Nanda, 2001; Wood, Read, Palfai & Stevenson, 2001).

The above research demonstrates that descriptive and injunctive norms have a powerful influence on determining behaviour. However, it is often imperative to discriminate between each type of norm as both refer to a different source of motivation (see, e.g., Cialdini et al., 1990; Deutsch & Gerard, 1955; Reno, Cialdini & Kallgren, 1993). While descriptive norms draw on the modelling and physical performance of a given behaviour, injunctive norms rely on the social rewards associated with that behaviour. Due to this distinction, the physical presence of another is not necessarily required for an injunctive norm to influence behaviour. Often, injunctive norms rely on the notion that people seek to satisfy the expectations of an imagined audience.

The influence of this imagined audience is of particular importance to the current study and, indeed, within the realm of environmental behaviour. Behaviours such as recycling or energy and water conservation are typically conducted within personal, private settings. In this context, the effectiveness of the injunctive norm requires an individual to draw on an imagined audience. Once focused on this audience, they are likely to conform to behavioural sanctions even when they are alone (Reno et al., 1993).

Previous environmental research has tested this idea by using written normative messages. These messages elicit an imagined audience to serve as a reinforcer of injunctive normative information. Subsequently, the individual's behaviour is influenced by the perceived social acceptance of this imagined audience (see, e.g., Goldstein et al., 2008; Schultz, Khazian, & Zaleski, 2008). Nolan et al. (2008) demonstrated the effect of an imagined audience on encouraging pro-environmental behaviour. By using fellow residents as an 'audience', normative influence had a significant effect on reducing household energy use. Even though this particular pro-environmental behaviour is private in nature, providing residents with normative information about the energy conservation of their neighbours led to significant decreases in energy use.

The current research will adopt this method by encouraging pro-environmental behaviour through written normative messages. I will employ a combined descriptive and injunctive normative message which previous research has demonstrated is effective in eliciting behaviour change (see, e.g., Schultz, Khazian, & Zaleski, 2008). Furthermore, Cialdini (2003) argued that only by combining these two norms can the motivation inherent in normative influence be competently utilised. Göckertiz et al. (2010) provide support for this claim. They reported that a combined normative had a

greater impact on conservation behaviour than a descriptive or injunctive normative message when used in isolation (see also Schultz, Khazian, & Zaleski, 2008). A second element of normative influence will now be considered before further discussing the methodology of the current study.

Situational norm information

It is not solely through observing others that we obtain cues for our own behaviour – situational characteristics also have a bearing on the effectiveness of normative information. Individuals act in particular ways when their environment reminds them of what behaviour is typical (Cialdini et al., 1990). Typically, we follow the lead of others if we believe that their past behaviour in the same context is adaptive or desirable for a given context. The majority of the literature on norms focuses on the importance of dispositional rather than contextual similarities (Goldstein et al., 2008). Instead of independently considering the nature of the personal characteristics held between individuals or groups, the characteristics of the context can introduce a distinction between information that is context specific (provincial normative information) or more universal (global normative information).

Provincial normative information refers to an individual's more immediate surroundings, whilst global normative information refers to less specific, more general normative information. Goldstein and colleagues (2008) created a distinction between provincial and global norms by pairing location information with normative information. Set within a hotel context, global normative information referred to the behaviour of previous hotel guests in general, while provincial normative information referred to the behaviour of guests who had previously stayed in the same room as current guests. Unlike previous research which specifically addresses the personal

similarities (e.g., age, gender, and attitudes) held between individuals, this research highlights the role of situational norm status on an individual's behavioural decision-making. When considering the specific pro-environmental behaviour of towel reuse, the findings suggest there is a notable difference between global and provincial normative information: Provincial normative information had a greater impact on encouraging guests' towel reuse. This contrast in effectiveness may be due to participants modelling behaviour that is more specific to their circumstances, as opposed to behaviour that is universal and not context dependent. The results of this study suggest that distinguishing between global and provincial normative information may be beneficial when designing behaviour change initiatives that incorporate normative influence.

Although the situation or environment consistently enforces beliefs about what behaviours are desired and normative, behaviour only becomes automatically guided when a norm is well-established or strongly aligned with social reference group information. For example, Aarts and Dijksterhuis (2003) found that priming a restaurant environment led to participants behaving in a well mannered, polite way – consistent with their knowledge of the behavioural requirements of that environment. The situational salience created in this research suggests the importance of our environment in influencing the uptake of normative information, particularly if the norm is well-established within a particular context.

Social reference and group identity

The relevance of a specific reference group is an important factor when considering the effect of social norm information on behavioural decision-making (see, e.g., Christensen, Rothgerber, Wood, & Matz, 2004; Tajfel & Turner, 1979,

1986; Terry & Hogg, 1996). The actions of people who have been in a similar situation provide a powerful normative influence for the individual's own behaviour (Griskevicius et al., 2008), particularly when the similarity of personal characteristics or experiences is high (see, e.g., Cialdini, 2001; Cialdini & Goldstein, 2003; Festinger, 1954; Goldstein & Cialdini, 2007; Griskevicius et al., 2008). Identity with a reference group enhances the likelihood of one being influenced by members of that group (Lapinski & Rimal, 2005). Individuals are sensitive to social pressures from a reference group and are motivated to conform to behaviour that is typical of the group (Schultz & Kaiser, forthcoming).

The impact of a social reference group on normative information is two-fold and linked to the distinction between descriptive and injunctive norms. A reference group may simultaneously model a particular behaviour (descriptive normative information) while expressing their approval associated with the behaviour (injunctive normative information). White et al. (2009) argued that fear of social rejection may compel an individual to engage in behaviour they know is socially desirable, therefore reducing the fear of social disapproval and the consequences associated with non-compliance (see also Rimal et al., 2005). However, this behavioural obedience may only take place if the individual views the social reference group as a favourable in-group.

The uptake of normative influence may indicate an individual wishes to align themselves with a social reference group by conforming to the behavioural standard. In support of this idea, Rimal and Real (2005) argue that the strength of an individual's identification with a reference group is important for two central reasons. First, as group affinity increases so does the effect of non-compliance: As one becomes more similar to fellow group members, the adverse consequences of non-

conformity become greater. Consequently, individuals tend to conform in order to increase group cohesion and benefit the group. Second, if the individual does not identify with the group, they may engage in a particular behaviour in an attempt to belong. This notion aligns with two major social psychology theories: social identity theory (Tajfel & Turner, 1979, 1986) and self-comparison theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987).

These two perspectives present normative influence as a method of creating positive distinctiveness for the individual who is motivated to make in-group identity distinct and more favourable than that of the out-group (Christensen et al., 2004; Vaughan & Hogg, 2005). The categorisation of oneself and others into a social group emphasises behavioural similarities and assists in conforming behaviour to the norm for the group (Vaughan & Hogg, 2005). A desire to be included in an in-group may lead to the obedience of social norms by reducing behaviour that is neither frequently conducted nor socially accepted by group members. Ultimately, since individuals desire to be associated with the in-group, they become more likely to engage in behaviours they perceive as frequent, socially accepted, and conducted by members of a group they wish to identify with.

Social reference group information also aligns with the situational status of normative information. Norms that are set within a provincial context may elicit a specific social identity but more generic, global normative information does not create such an association. Take for example waiting at a bus stop. Typically, we wait our turn in line, sit / stand under the shelter if it is raining, and afford people their own personal space, etc. If an individual waiting at a bus stop observes others engaging in this type of behaviour, they themselves are likely to engage in the same behaviours. The similarity of their own circumstances increases their uptake of the normative

behaviour that is modelled by the reference group they wish to become a part of. In this example, the normative behaviour associated with waiting at a bus stop (situational context) becomes strongly associated with a specific reference group. Social reference group information is particularly important in the domain of environmental behaviour as there is a necessity for members of the public to take personal responsibility for what are ultimately group-level outcomes (Clayton & Myers, 2009). Therefore, the role of normative influence needs to be considered alongside situational factors and social reference group information.

The effect of reference group information has been reported in several areas including information recall (Johnson et al., 2002), measures of out-group derogation (Mummendey, Klink, & Brown, 2001), and consumer preferences (White & Dahl, 2006). Extant research has demonstrated that the influence of social reference group information also extends to the domain of environmental behaviour (several examples are discussed below).

Whether through the type of normative information, the situational status of the information, or the reference group to which it applies, normative information serves to motivate and guide individual behaviour by demonstrating what is socially acceptable or adaptive within a particular context. The discussion now turns to a consideration of the role of normative influence on encouraging pro-environmental behaviour.

Normative influence and pro-environmental behaviour

The amalgamation of social norm theory with environmental research is an emerging field within psychological research. This amalgamation may provide researchers and practitioners with useful methods for promoting pro-environmental

behaviour. One of these methods involves the incorporation of social norms into behaviour change initiatives. Several researchers have begun testing this idea for household and organisationally-based environmental behaviours. Both of these areas will now be discussed.

Household behaviour change

Midden and Ritsema (1983) investigated the specific environmental behaviour of household energy use. They showed that individuals who did not personally believe in energy conservation but witnessed members of their neighbourhood engaging in such behaviour were more likely to engage in the behaviour themselves; normative information from a significant reference group influenced personal energy use. A more recent household electricity study conducted by Schultz et al. (2007) reported similar results. Participants presented with a combined descriptive and injunctive normative message significantly reduced their household electricity use after being informed of the following: a) that their neighbours had lower levels of energy use; and b) it was more socially accepted to use less energy. These two studies demonstrate the potential for behaviour change by incorporating normative information into behaviour-change programmes. Providing residents with descriptive and injunctive normative information led to significant reductions in energy consumption, reductions which result in considerable benefits for residents and the environment.

Additional research by Schultz (1998) examined the effect of social norms on household recycling behaviour. Households were allocated to one of several experimental conditions (including environmental and normative-based pleas) and residents' recycling efforts were monitored. Residents with little inclination to recycle substantially increased their recycling efforts after the introduction of descriptive

normative information regarding the recycling efforts of their neighbours. More importantly, this normative condition had a greater effect on behaviour change than a recycling message that solely informed residents about how to recycle (see Figure 2).

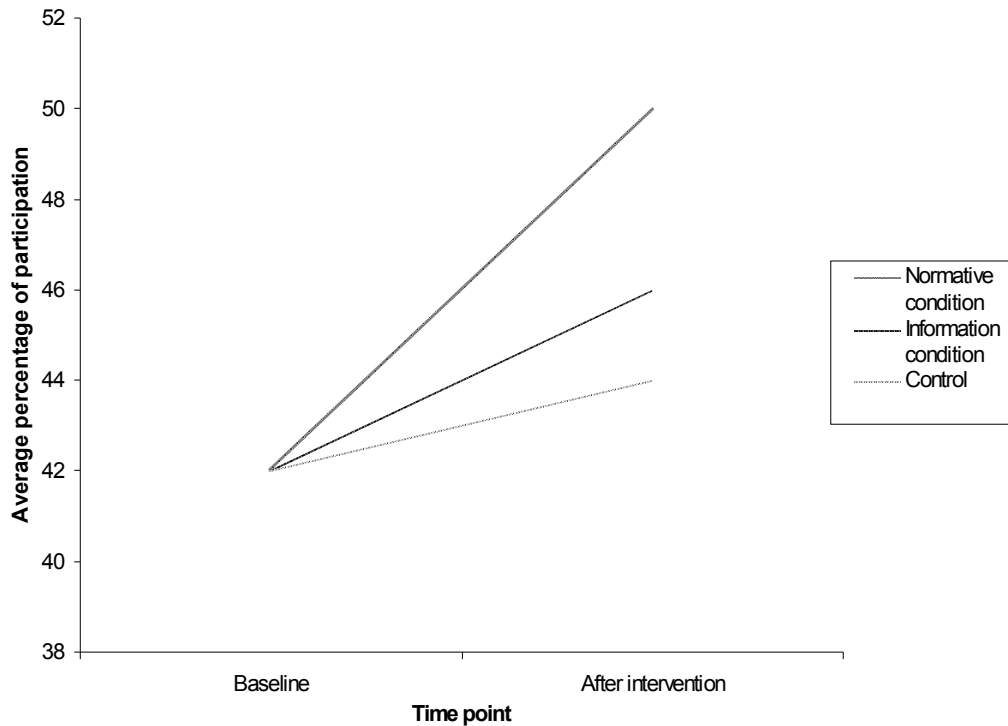


Figure 2. Participation in the recycling programme by experimental condition

(adapted from Schultz, 1998).

One additional study into recycling was conducted by White et al. (2009). They found that an increase in perceived group support for recycling led to an increase in intention to recycle. This was particularly the case if the individual strongly identified with the social reference group, in this case, family and friends. Additional environmental research that employed normative influence has reported a significant increase in recycling behaviour (see, e.g., Ewing, 2001), increases in water (Corral-Verdugo & Frías-Armenta, 2006) or energy conservation (see, e.g., Costanzo, Archer, Aronson, & Pettigrew, 1986; Göckeritz et al., 2010), and an increase in efforts for ecological conservation (see, e.g., Chen, Lupi, He, & Liu, 2009). This previous

research demonstrates the role that normative influence can play in increasing pro-environmental behaviours within a household context, leading to significant benefits for residents and the environment.

Organisational behaviour change

The application of normative influence to organisational contexts offers an avenue for behaviour change on a considerable scale – much greater than research that seeks to change behaviour on a one-to-one basis. Due to the large number of individuals within an organisation, even small changes in behaviour can have a large effect when the frequency of behaviour change is considered. This influence is not confined to employees or members of an organisation, but can also extend to clients and consumers. For example, organisations can use social norm research to enlighten consumers about factual levels of pro-environmental behaviour (Griskevicius et al., 2008), with the overall aim of encouraging such behaviour. As organisations can have significant pulling power in applying social norm theory to behaviour change, considerable gains could be made at the individual and collective level by mobilising organisations in the global fight for environmental conservation.

An example of such mobilisation is the American company OPOWER (www.opower.com). This organisation draws on the social norm research of Cialdini, Schultz, and others, to deliver an energy efficiency programme with the goal of reducing household energy consumption. While OPOWER might be seen as working against utility companies, in reality it attempts to assist electricity companies to meet their efficiency goals. Subscribers to the programme have the ability to access their energy usage statistics using interactive computer software that draws on normative information. A client's energy usage is compared to their 'energy efficient' neighbours

(descriptive normative information) and then coupled with injunctive normative information (provided in the form of an emoticon or smiley face) that differs depending on their energy usage. By providing customers with a point of social reference, OPOWER promotes significant reductions in energy use (1.5% – 3.5% on average) through the large scale application of normative influence.

The hospitality industry offers an extra route for behaviour change on a substantial scale. More and more frequently, hotels are requesting guests to reuse bath towels or bed linen in an effort to conserve resources and reduce chemical use. Despite the considerable benefits associated with applying normative theory, hotel reuse pleas do not typically incorporate such information (Goldstein et al., 2008). Recently, normative theory has been applied in two hotel-based studies in an effort to rectify this limitation. These studies investigated the suitability of applying normative influence to encourage the specific pro-environmental behaviour of towel reuse. Due to the relevance to the current research, each study will now be discussed in greater detail.

Goldstein et al. (2008) and Schultz, Khazian and Zaleski (2008) had the ultimate goal of using social norm information to increase the pro-environmental behaviour of hotel guests through bath towel reuse. Their research investigated the effectiveness of normative messages against current messages used in the hotel industry. Existing towel reuse pleas employed by hotels appeal to guests' environmental concerns, their responsibility to the well-being of the environment, their social responsibility to future generations, or the financial savings that can be made by the hotel (Cialdini & Goldstein, 2002). These two studies adapted the content of current pleas by introducing normative information that focused guests on the prevalence and social approval of towel reuse.

Goldstein et al. (2008) assessed the effectiveness of current hotel messages by exploring the impact of three elements of normative information: descriptive norms, the situational status of the norm, and the effect of a social reference group. Across two experiments, hotel guests were informed of the towel reuse behaviour of ‘fellow citizens’, other men and women, guests who had stayed in the hotel in general, or guests who had previously stayed in the same room as current guests. Experiment 1 tested a social norm message versus a standard environmental message (the hotel’s current message and the current industry standard). The environmental message informed guests of the importance of environmental conservation without including any normative information. In contrast, the social norm message included descriptive normative information by informing guests that the majority of other hotel guests (almost 75%) reuse their towels. Data were collected from 190 hotel rooms in a mid-priced hotel in the United States. As predicted, the use of normative messages led to significantly greater towel reuse when compared to the environmental message. That is, the inclusion of descriptive normative information led to a significant increase in the pro-environmental behaviour (towel reuse) of guests at the hotel (see Figure 3 for the results of Experiment 1).

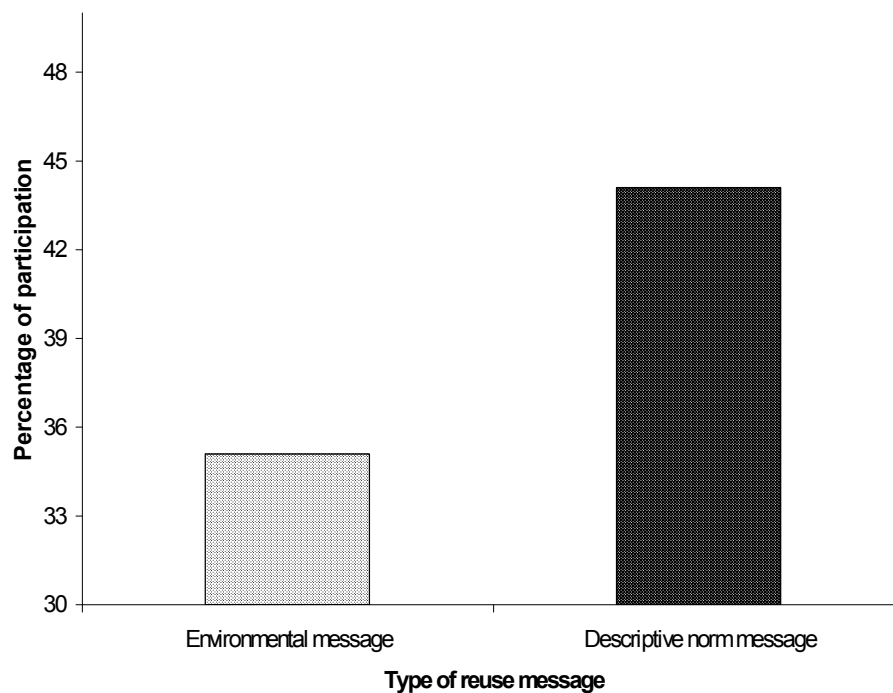


Figure 3. Towel reuse by experimental condition (source: Goldstein et al., 2008; Experiment 1).

Experiment 2 sought to expand the findings of the first experiment by investigating how social reference group information and situational status may alter the effectiveness of descriptive normative information. Guests were placed in one of five conditions: a) descriptive normative information based on the towel reuse of guests who stayed in the same room as current guests (provincial normative information); b) descriptive normative information based on the towel reuse of guests who stayed in the hotel in general (global normative information); c) descriptive normative information paired with the reference group of citizen; d) descriptive normative information paired with the reference group of gender; or e) a standard environmental message appealing for environmental conservation. As expected, situational status led to significant differences in the effectiveness of normative information. Guests reused more towels when informed that previous guests who stayed in the same room elected to reuse their towels (the provincial norm condition).

This finding is consistent with previous research addressing the effect of reference group similarity. Knowledge that those modelling the behaviour were in the same context / situation as current participants encouraged replication of the behaviour (see, e.g., Cialdini, 2001; Cialdini & Goldstein, 2003; Festinger, 1954; Goldstein & Cialdini, 2007; Griskevicius et al., 2008).

Moreover, and consistent with Experiment 1, guests in the global normative condition reused significantly more towels than guests provided with the hotel's standard environmental message. Although towel reuse rates were greater for the reference group norms (citizen and gender) than for the hotel's standard environmental message, participants were more likely to follow the norms of others with whom they shared the same setting than with those who they shared the same social identity. This finding provides contrary evidence to the expectations of social identity theory (see Tajfel & Turner, 1979, 1986) that proposes individuals are influenced by the actions of others whom they wish to become like or associate with. The findings of Goldstein et al. (2008) suggest that the situational status of normative information is a more powerful influence on shaping behaviour than social identity information.

Overall, the results of Goldstein et al. (2008) suggest that descriptive normative information can be successfully applied within a hotel context to promote pro-environmental behaviour. Such application appears to be more effective than typical methods that solely draw on environmental concerns. A second study conducted by Schultz, Khazian and Zaleski (2008) investigated this concept further by considering the role of injunctive social norms. Using three experiments, this study compared the effectiveness of descriptive, injunctive, and combined descriptive and injunctive normative messages on the towel reuse behaviour of hotel guests.

Experiment 1 compared the towel reuse behaviour of hotel guests staying within 62 hotel rooms at a beach resort. Six conditions were used in this first experiment: a) a high injunctive descriptive norm; b) a low injunctive descriptive norm; c) a high descriptive norm; d) a low descriptive norm; e) a combined high descriptive and high injunctive norm; and f) a control condition absent of any normative information but briefly stating that the hotel had a conservation programme. The strength of the injunctive message (high / low) was determined by a distinction between “*many* of our guests have expressed to us their approval of conserving energy” and “*some* of our guests have expressed to us the approval of conserving energy”. Percentage values were also assigned to denote the frequency of towel reuse (25% for low descriptive norm, 75% for high descriptive norm). The results showed that when used independently there was no significant effect for either descriptive or injunctive normative messages. However, when paired together there was a significant increase in the number of towels reused (see also, Gökertiz et al., 2010). Congruent with the findings of Goldstein et al. (2008), guests increased their towel reuse when provided with normative information regarding the behaviour of other guests at the hotel.

Experiment 2 was designed to replicate the findings of the first experiment within a slightly different context. In this study, guests were those staying in apartments at the same hotel complex. Unlike the sample of hotel guests, the apartments contained a large number of family groups. Two conditions were used in this second experiment: a) a combined descriptive and injunctive normative message; and b) a control message containing procedural information. As expected, guests presented with the normative message reused more towels than those presented with the control message. This finding demonstrates the effectiveness of reuse messages

that contain both descriptive and injunctive normative information. This type of message led to more reused towels than information only messages.

Schultz, Khazian and Zaleski (2008) conducted a third experiment with the added consideration of social identity information. Experiment 3 tested the impact of a specific reference group against a generic reference group. Data were collected from the same setting as the second experiment but at a later time point. Three conditions were used: a) a combined descriptive and injunctive normative message describing the reuse behaviour of generic hotel guests; b) a combined descriptive and injunctive normative message describing the reuse behaviour of hotel guests who had stayed in the same room as current guests; and c) a control message solely describing procedural information about how to reuse one's towel. Consistent with initial predictions, the control condition reported the lowest amount of towel reuse. This affirms the suggestion that normative information is more effective at eliciting towel reuse than the current industry standard that appeals to environmental considerations. Schultz, Khazian and Zaleski (2008) found no significant difference between global normative and provincial normative conditions, a result that conflicts with the findings of Goldstein et al. (2008). This contrasting result suggests that the relationship between situational status and the uptake of normative information is more complicated than initially perceived, and is worthy of additional consideration.

The findings of these two studies show there are significant benefits to applying normative influence within a hotel context. Guests reused a greater number of towels when presented with normative information compared to guests exposed to conventional reuse messages. These findings concur with several previous studies that align normative influence with pro-environmental behaviour. When taken together, this body of research demonstrates a tangible link between normative influence and

pro-environmental behaviour change. The current research seeks to build on this link by considering the effect of normative influence on two behaviours within a New Zealand context.

The current research

I carried out two studies to investigate the usefulness of normative influence in encouraging pro-environmental behaviours. Specifically, I sought to answer one overall question: Can normative information be used to increase pro-environmental behaviour? A large body of literature already suggests that indeed it can; however, the current research considered two methodological approaches with the additional extension of setting the research within a New Zealand context. Study 1 used a self-report measure to compare participants' willingness to engage in household energy efficiency across several normative and non-normative conditions. A second study investigated the effect of normative information on the towel reuse behaviour of hotel guests. The current research adds to an existing body of literature while offering findings that are set within a New Zealand context, a country synonymous for its 'clean and green' reputation.²

Moreover, each study considered the effectiveness of environmentally orientated messages that highlight a moral concern for the environment. The current research adds to a growing body of literature that looks to identify more effective approaches for promoting pro-environmental behaviour than existing behaviour change initiatives that typically rely on education or environmental concern.

² The latest environmental performance index rankings place New Zealand 15th out of 163 countries (Yale University, 2010). Despite this, it is important to acknowledge that the behaviour of New Zealanders doesn't necessarily reflect their attitudes concerning environmental conservation. This is particularly true for individual-level behaviours such as installing home insulation or energy efficient devices (see, e.g., EECA. 2011).

CHAPTER TWO: STUDY 1

Study 1

Study 1 compared the effectiveness of normative and non-normative messages on encouraging participants' willingness to engage in household energy efficient behaviours. This particular type of pro-environmental behaviour can be categorised as 'private-sphere environmentalism' (see, e.g., Stern, 2000). This class of behaviours encompasses the purchase and use of household items that have a significant impact on the environment (Stern, 2000; see also, Schultz & Kaiser, forthcoming).

The following four conditions were used in Study 1:

Control condition: *This condition served as a baseline and did not contain any normative information.*

Environmental condition: *An environmental condition measured the effectiveness of current pro-environmental messages that attempt to persuade individuals to engage in pro-environmental behaviour. Similar to the control condition, no normative information was included.*

Global normative condition: *A combined descriptive and injunctive global normative message referencing New Zealanders' household energy use.*

Provincial normative condition: *A combined descriptive and injunctive provincial normative message referencing Wellingtonians' household energy use.*

These four conditions enabled several comparisons to be made regarding the effectiveness of normative messages in encouraging individuals' self-reported pro-environmental behaviours. The wording of each message is given below in the Method section for Study 1.

Hypotheses

Overall, it was predicted that the inclusion of normative information would lead to higher willingness to engage in household energy efficiency. Along with this

broad hypothesis, several other predictions were made based on the effectiveness of each message.

H₁: *Greater willingness to engage in energy efficiency behaviour would be reported by participants exposed to an environmental message compared to those in the control condition.*

This prediction reflects current messages (such as those used by the Energy Efficiency and Conservation Authority; EECA) that rely on environmental or financial incentives.

H₂: *Participants in the global normative condition would record higher willingness to engage in energy efficient behaviours than participants in the environmental condition.*

It was predicted that knowledge regarding how others behave and what they perceive as socially acceptable would trump a moral responsibility to the environment. This prediction is consistent with the results of several previous studies linking normative influence with pro-environmental behaviour change (see, e.g., Goldstein et al., 2008; Nolan et al., 2005; Schultz, 1998, Schultz, 2007; Schultz, Khazian, & Zaleski, 2008).

H₃: *Participants in the provincial normative condition would report a higher willingness to engage in energy efficient behaviours than those in the global normative condition.*

Support for this hypothesis would be consistent with the results of Goldstein et al. (2008) and the expectations of social identity theory (see, e.g., Tajfel & Turner, 1979, 1986). People should desire to replicate the behaviour of in-group members, particularly since the in-group is determined by the situational status of normative information. This provincial normative information should be perceived as more specific to the individual's current circumstances or environment, subsequently having a greater influence on behaviour than information that is more universal or generic.

H₄: *The inclusion of normative information will lead to an increase in environmental concern.*

By using an environmental concern measure, I compared participants' concern for the environment before and after the introduction of normative information. I hypothesised that the inclusion of social norms would lead to higher environmental concern. It was expected that the knowledge that others actively engage in behaviours that benefit the environment (in this case, energy efficiency) would increase participants' environmental concern.

The current study sought to demonstrate the effectiveness of applying normative-based messages in promoting pro-environmental behaviours. Furthermore, it sought to compare the effectiveness of normative versus environmental messages set within a New Zealand context and within Stern's (2000) classification of private-sphere behaviours.

Method

Participants

A sample of 190 members of the public participated in this study (101 female; 89 male). The mean age was 30.48 ($SD = 12.50$) with a range of 18 to 79 years. The majority of participants (73.70%) identified themselves as New Zealand European / Pākehā. A smaller number of participants identified as Māori (4.70%), Asian (3.70%), Indian (3.20%), or Pacific Island (0.50%). Twenty-six participants identified with the category of "other" and one participant did not specify any ethnicity.

Procedure

Participants were approached in a busy public place and asked at random if they would like to participate in a social psychology survey. Participation involved completing a short questionnaire which assessed self-reported willingness to engage in household energy efficiency behaviours and general perceptions about the environment (see Appendix I). After completing the questionnaire, participants were provided with an information sheet and a debriefing sheet (see Appendices II and III, respectively). This study was approved by the School of Psychology Human ethics Committee under delegated authority of the Victoria University of Wellington Human Ethics Committee.

Participants were randomly assigned to one of four experimental conditions. Frequency analysis revealed the following distribution: Forty-seven participants in the control condition; 48 in the environmental condition; 49 in the global normative condition; and 46 in the provincial normative condition. Chi-square tests were conducted to investigate the possibility of group differences for age, gender, and ethnicity. There were no significant associations between experimental condition and gender ($\chi^2(3) = 5.40, p > .05$), ethnicity³ ($\chi^2(3) = 1.34, p > .05$), or age ($F(3, 185) = 1.96, p > .05$).

Measures

The questionnaire included demographic items and the measures described below. All measures were computed so that higher scores indicate more of the relevant construct.

³ In this analysis, ethnicity was computed into a dichotomous variable: New Zealand European / Pākehā and non-New Zealand European / Pākehā.

Normative priming

Four different messages concerning household energy use were included in the questionnaire across the four conditions: a) an environmental message; b) a descriptive and injunctive global normative message; c) a descriptive and injunctive provincial normative message; and d) a control condition. The following text was used for each condition with the exception of the control condition which contained no extra information.

Environmental message: *Energy use has a significant effect on the environment. Engaging in energy efficient behaviours is one way you can reduce the effect of energy use on the environment.*

Global normative message: *Many New Zealanders believe in energy conservation. On average, more than 53%⁴ of New Zealand households engage in energy efficient behaviours. This demonstrates that a large number of New Zealanders value energy conservation and engage in associated behaviours.*

Provincial normative message: *Many Wellingtonians believe in energy conservation. On average, more than 53% of Wellington households engage in energy efficient behaviours. This demonstrates that a large number of Wellingtonians value energy conservation and engage in associated behaviours.*

Alongside the respective messages (and included in the control condition) was the following household energy efficiency information:

Household energy use is one of the largest contributors to New Zealand's overall energy use. Each year, New Zealand homes account for 12% of the country's total energy use. In 2008, \$2.5 billion was spent by households on electricity alone. Choosing to manage the way you use energy means you can have lower power bills, a warmer, healthier home, and less of an impact on the environment.⁵

⁴ This information was provided by the New Zealand Energy Efficiency and Conservation Authority (EECA).

⁵ This text was taken from www.eeca.govt.nz.

The above text was placed before the measure of energy efficiency behaviour. Differences in self-reported behaviours were then compared across conditions to investigate which message was most effective in encouraging energy efficient behaviours.

Manipulation check

Three items were used to test the effectiveness of the priming manipulation. Participants were asked to indicate on a seven-point Likert scale (1 = *no positive impact*; 7 = *very high positive impact*) how they would rate the positive impact of energy efficient behaviours on the environment. This first item was included to assess the effectiveness of the environmental condition. Two additional items were included to test the effectiveness of the normative messages. One item asked participants to rate New Zealanders' overall engagement in energy efficient behaviours, while the other asked about Wellingtonians' engagement. Participants responded to both items on a seven-point Likert scale (1 = *low engagement*; 7 = *very high engagement*).

Willingness to engage in energy efficiency

A fourteen item measure was developed using a checklist from New Zealand's Energy Efficiency and Conservation Authority (EECA; www.eeca.govt.nz). This measure was developed to record participants' willingness to engage in several energy efficient behaviours around the home. Consistent with Stern's (2000) environmental behaviour dimension of private-sphere environmentalism (see also Schultz & Kaiser, forthcoming), these behaviours are easy to perform and applicable to all households.

Participants indicated (on a five-point Likert scale; 0 = *not at all willing*, 4 = *extremely willing*) the extent to which they were willing to engage in several household behaviours such as “*reduce the length of showers*” and “*keep computers in standby settings when not in use*”. An initial Principal Components Analysis for the energy efficiency measure produced three components with eigenvalues above one, accounting for a cumulative total variance of 52.84%. The scree test after varimax rotation also suggested a three component solution. However, closer inspection revealed that there were several items that loaded highly across more than one dimension. After practical and theoretical consideration, two factors were distinguished by their type of household energy behaviour. These two dimensions were identified as energy efficiency and energy conservation.

The energy efficiency dimension consisted of the following six items: “*choose to buy energy efficient appliances*” (buy efficient); “*replace light bulbs with energy efficient bulbs*” (efficient bulbs); “*use the eco-cycle option in dishwashers*” (eco dishwashers); “*check the seals on the fridge*” (fridge seals); “*regularly defrost the freezer*” (freezer); and “*use a thermostat and timer on heaters*” (heater timer). This six-item dimension showed high internal reliability (Cronbach’s alpha = .79) with a mean inter-item correlation of .38.

The energy conservation dimension consisted of the following eight items: “*switch items off at the wall when not in use*” (wall); “*turn lights off when not using them*” (lights); “*reduce the length of showers*” (showers); “*keep computers on standby settings when not in use*” (computer); “*wash clothes in cold water rather than hot water whenever possible*” (cold wash); “*wash full loads of laundry rather than several smaller loads*” (full laundry); “*only use a heated towel rail when needed*” (towel rail); and “*close curtains to keep heat in*” (curtains). This eight-item dimension

had an internal consistency slightly lower than the first dimension (Cronbach's alpha = .67)⁶. The mean inter-item correlation was .21.

Environmental attitudes

The current study measured environmental attitudes using the New Ecological Paradigm Scale (NEP; Dunlap, Van Liere, Mertig, & Jones, 2000). This 15 item measure was developed as an improved version of the original measure (the New Environmental Paradigm; Dunlap & Van Liere, 1978) by including a more balanced set of pro- and anti-environmental attitudes, updating outdated terminology, and broadening the content of the scale (for a more thorough comparison of the two measures, see Hawcroft & Milfont, 2010).

The NEP requires participants to indicate their level of agreement on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*) for items such as “*humans are severely abusing the environment*” and “*the so called ‘ecological crisis’ facing humankind has been greatly exaggerated*” (reverse worded). In its initial publication, the NEP Scale had high internal consistency (Cronbach's alpha = 0.83), moderate to strong inter-item correlations, and significant correlations with several other measures of environmental attitudes and pro-environmental behaviours (see Dunlap et al., 2000). These results indicate that the NEP Scale has high internal consistency and predictive validity.

The 15 items contained within the NEP Scale measure five different facets of an ecological worldview (3 items each): (1) The reality of limits to growth; (2) anti-anthropocentrism; (3) the fragility of nature's balance; (4) rejection of

⁶ Although this is slightly lower than the .70 value commonly assumed acceptable, some researchers argue that even low alpha values do not undermine the reliability of a measure (see, e.g., Schmitt, 1996).

exemptionalism; and (5) the possibility of an ecocrisis.⁷ For the eight odd-numbered items, higher agreement indicates a pro-ecological worldview. For the seven even-numbered items, higher agreement indicates an anti-ecological worldview. A complete list of items is in the survey presented in Appendix I.

In the current study, the NEP Scale measure was split; seven items were presented before the aforementioned priming manipulation (pre-prime) and the remaining eight items were presented after the prime (post-prime). Each measure was balanced so that reverse-scored items and items from each facet of the scale were shared across the pre- and post-prime measures. Correlation analysis revealed that the pre- and post-prime NEP scores were significantly positively correlated ($r = .51, p < .01$). For the pre-prime measure the Cronbach's alpha was .65 ($M_{inter-item\ correlation} = .21$) and for the post-prime measure it was .73 ($M_{inter-item\ correlation} = .25$).

Results

Preliminary analyses

Although visual analysis of normal distribution curves indicated that the NEP Scale and energy efficiency measures were normally distributed, skewness and kurtosis statistics (see Table 1) were significantly distanced from an ideal score of zero. The further the skewness and kurtosis values are from zero, the more likely that the data are not normally distributed (Field, 2009). Furthermore, a Kolmogorov-Smirnov test indicated that energy efficiency scores were significantly non-normal: $D(188) = 0.07, p < .05$. This violation of normality may undermine the validity of later statistical analysis (Field, 2009). To rectify this

⁷ For a more detailed discussion, see Hawcroft & Milfont (2010).

limitation, the scores for both measures underwent logarithmic transformations. This method of transformation was chosen due to the beneficial effect it had on improving skewness and kurtosis statistics and rectifying problems of non-normality.⁸ All subsequent analysis uses the logarithmically transformed data.

The data were then scanned for the presence of multivariate outliers. Two participants were identified as outliers (one male from the control condition and one female from the global normative condition). These cases had Mahalanobis distances significantly greater than the chi-square critical value at the 0.001 significance level (Fidell & Tabachnick, 2003). These cases were subsequently excluded from later analysis

⁸ Although there is some debate in the literature as to the validity of transformed data (see, e.g., Games, 1983, 1984), Levine and Dunlap (1983) have argued that transformations which normalise the distribution of a data set serve to increase statistical power. This view is also supported by Field (2009) who argues that data transformations can reduce the impact of outliers and correct problems regarding normality.

Table 1

Skewness statistics for NEP and energy efficiency items (non-transformed data)

Item	Skewness statistic	Kurtosis statistic
Pre-prime NEP items		
NEP 1	-0.34	-0.72
NEP 3	-0.75	0.18
NEP 5	-0.96	1.04
NEP 9	-1.24	-0.68
NEP 10	-0.33	2.78
NEP 11	-0.47	-0.71
NEP 13	-0.60	-0.25
Post-prime NEP items		
NEP 2	-0.10	-1.00
NEP 4	0.05	-0.51
NEP 6	0.80	-0.08
NEP 7	-1.26	1.22
NEP 8	-0.54	-0.23
NEP 12	-0.66	-0.56
NEP 14	-0.07	-0.73
NEP 15	-0.53	-0.02
Energy efficiency items		
Wall	-0.85	-0.04
Lights	-1.94	3.55
Buy efficient	-0.49	-0.63
Showers	-0.07	-0.93
Efficient bulbs	-0.85	-0.16
Computer	-1.07	0.35
Cold wash	-1.42	1.47
Eco dishwashers	-1.26	0.90
Curtains	-1.54	1.52
Fridge seals	-0.82	0.13
Full laundry	-1.55	2.39
Towel rail	-1.09	0.08
Freezer	-0.19	-0.79
Heater timer	-0.60	-0.54

Priming manipulation check

T-tests were conducted to measure the effectiveness of the priming manipulation. Comparisons between the control condition and each experimental condition revealed that the priming messages were not effective at the statistically significant level (see Table 2 for descriptive statistics).

First, there was no significant difference ($t(90) = -0.32, p > .05$) between participants in the control condition ($M = 4.93, SD = 1.18$) and participants in the environmental condition ($M = 4.85, SD = 1.20$) for perceptions of the environmental impact caused by energy use. This indicates that the environmental message was not effective in promoting higher perceptions regarding the positive impact of energy efficient behaviours on the environment.

Second, there was no significant difference ($t(93) = -0.87, p > .05$) between participants in the control condition ($M = 4.11, SD = 1.18$) and those in the global normative condition ($M = 4.31, SD = 1.11$) for scores on the perceived energy efficiency engagement of New Zealanders. This suggests that the global normative message was not effective in increasing perceptions about the energy efficiency behaviour of New Zealanders.

Third, there was no significant difference ($t(89) = -1.16, p > .05$) between participants in the control condition ($M = 4.02, SD = 1.00$) and participants in the provincial normative condition ($M = 4.27, SD = 1.01$) for scores on the perceived energy efficiency engagement of Wellingtonians. Thus, the provincial normative message was not effective in increasing perceptions regarding Wellingtonians' energy efficiency behaviours.

Although there were no significant statistical differences between conditions, observations of the mean scores did show a difference (see Table 2).

Scores on the manipulation check were higher for the normative conditions than for the control condition. This suggests there may have been some effect of priming (in the desired direction), despite the effect not reaching statistical significance. Moreover, the normative conditions had significant differences compared to the environmental condition: Participants in the global normative condition rated New Zealander's engagement as significantly higher ($M = 4.31$, $SD = 1.11$) than those in the environmental condition ($M = 3.77$, $SD = 1.24$), $t(93) = -2.26$, $p < .05$, and participants in the provincial normative condition rated the engagement of Wellingtonians' ($M = 4.27$, $SD = 1.01$) marginally higher than participants in the environmental condition ($M = 3.83$, $SD = 1.23$), $t(91) = -1.85$, $p = .07$. No other significant differences were found between conditions for the manipulation checks. Overall, these results suggest that the normative prime led to differing response scores in the expected direction, despite these differences not reaching statistical significance.

Table 2

Statistics for the Priming Manipulation

Condition	Wellingtonians' Perceived Engagement		New Zealanders' Perceived Engagement		Environmental Impact	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Control	4.02	1.00	4.11	1.18	4.93	1.18
Environmental	3.83	1.23	3.77	1.24	4.85	1.20
Global normative	4.02	1.21	4.31	1.11	4.76	1.25
Provincial normative	4.27	1.01	4.18	0.96	5.07	1.16

Willingness to engage in energy efficiency

A between-subjects one-way Analysis of Variance (ANOVA) reported no significant difference across experimental conditions for participants' willingness to engage in energy efficient behaviours ($F(3,186) = 1.58, p > .05$).⁹ On initial inspection, there appeared to be no significant effect of normative information on encouraging pro-environmental behaviour.¹⁰ However, I conducted several follow-up *t*-tests to investigate this claim further.

In linking to H₃, I conducted a planned comparison test between the global normative and provincial normative conditions.¹¹ A marginally significant difference was observed between the global normative and provincial normative conditions ($t(93) = 1.87, p = .07$). Participants in the global normative condition ($M = 0.42, SD = 0.09$) had higher willingness to engage in energy efficiency behaviors than participants in the provincial normative condition ($M = 0.38, SD = 0.08$). This finding suggests that general normative information had a greater effect (albeit marginal) on energy efficient behaviours than specific normative information.

Additionally, a significant difference was observed between participants in the control condition and those in the global normative condition ($t(94) = -2.00, p < .05$). Participants in the global normative condition ($M = 0.42, SD = 0.09$)

⁹ The variances were deemed to be equal for all four conditions as evidenced by a Levene's test: $F(3,186) = 0.72, p > .05$.

¹⁰ This effect remained when comparing scores across two conditions - normative information (combining both normative conditions) versus non-normative information (combining the environmental and control conditions): $t(188) = -0.98, p > .05$.

¹¹ Other planned comparison tests were conducted based on prior predictions. H₁ (environmental message more effective than control message; $t(93) = 0.69, p > .05$) and H₂ (global normative message more effective than environmental message; $t(95) = -1.17, p > .05$) were not supported.

showed higher willingness to engage in energy efficiency behaviours than participants in the control condition ($M = 0.38$, $SD = 0.08$). This finding suggests that the presence of global normative information had a beneficial influence on promoting participants' willingness to engage in energy efficiency behaviours. The use of a normative message led to higher scores compared to a control message that did not contain any normative information. Statistics for participants' self-reported energy efficiency are reported in Table 3.

Table 3

Statistics for self-reported energy efficiency by condition

Condition	Overall energy efficiency		Energy efficiency dimension		Energy conservation dimension	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Control	0.38	0.08	0.40	0.10	0.36	0.08
Environmental	0.39	0.10	0.42	0.12	0.38	0.09
Global normative	0.42	0.09	0.45	0.12	0.39	0.08
Provincial normative	0.39	0.08	0.41	0.10	0.37	0.07
All conditions combined	0.38	0.08	0.41	0.10	0.36	0.08

Energy Efficiency Dimensions

A between-subjects one-way ANOVA revealed no significant difference between the experimental conditions for the energy efficiency dimension ($F(3,186) = 2.01$, $p > .05$) or the energy conservation dimension ($F(3,186) = 0.87$, $p > .05$).¹² Consistent with previous analysis, I conducted several follow-up tests to compare scores across the four experimental conditions.

¹² These non-significant results remained when comparing between normative and non-normative conditions. Efficiency dimension: $t(188) = -1.37$, $p > .05$; conservation dimension: $t(188) = -0.46$, $p > .05$.

First, there was a significant difference for the energy efficiency dimension between the control condition and global normative condition ($t(94) = -2.29, p < .05$). Participants in the global normative condition ($M = 0.45, SD = 0.12$) had significantly higher scores for energy efficient behaviours than participants in the control condition ($M = 0.40, SD = 0.10$). Second, a marginally significant difference was observed on the same dimension when comparing participants in the provincial normative condition with those in the global normative condition ($t(93) = 1.96, p = .05$). Participants in the global normative condition ($M = 0.45, SD = 0.12$) showed a marginally greater willingness to engage in energy efficient behaviours than participants in the provincial normative condition ($M = 0.41, SD = 0.10$). These findings are consistent with earlier analysis using the entire energy efficiency measure.

These results suggest two important findings: (1) The inclusion of normative influence was more effective in promoting pro-environmental behaviour than a message that did not contain any normative information; and (2) global normative information has a greater influence than provincial normative information.

NEP scores

A within-subjects repeated measures ANOVA showed a significant difference between the pre- and post-prime NEP measures ($F(1,184) = 72.88, p < .0001$; partial Eta-Square = .28). Scores on the NEP were significantly greater for the post-prime measure ($M = 0.43; SE = .01$) than for the pre-prime measure

($M = 0.37$; $SE = .01$).¹³ These results are consistent with practical and theoretical expectations, as it was expected that the priming manipulation would increase environmental concern (see Figure 4).

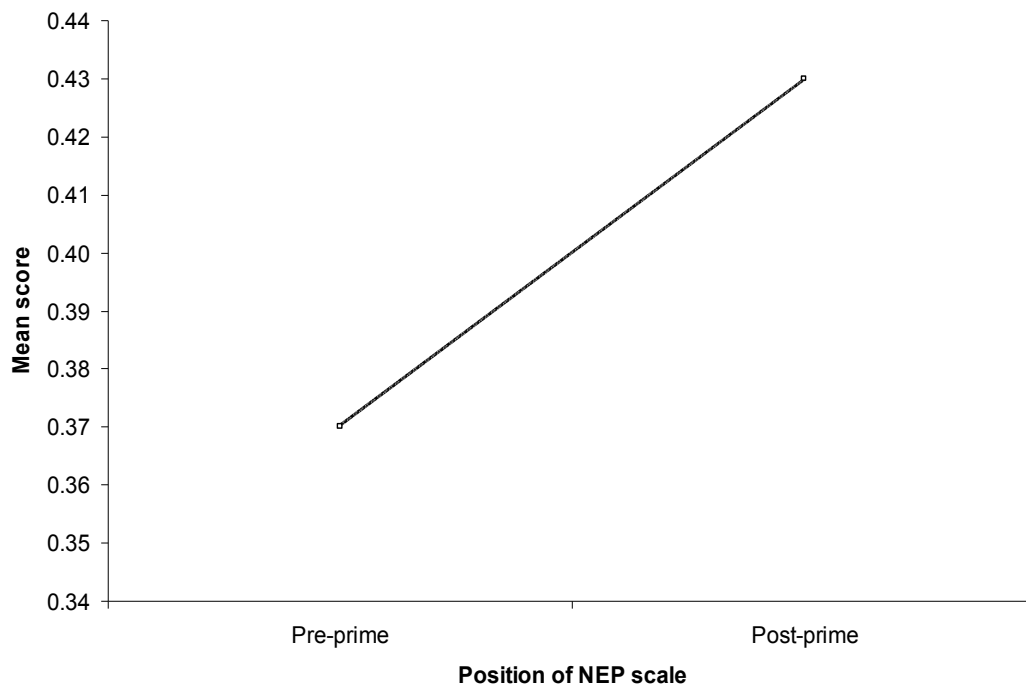


Figure 4. Environmental concern before and after the priming manipulation.

The difference between pre- and post-prime NEP scores was not explained by experimental condition, as no significant interaction was found: $F(3,184) = 0.65$, $p > .05$. Furthermore, there was no difference between the pre- and post-prime NEP scores when directly comparing the control condition with the experimental conditions.

A priming effect would be demonstrated by a significant difference between pre- and post-prime NEP scores for participants in a combined non-

¹³ This finding became non-significant after controlling for age and gender: $F(1,184) = 0.21$, $p > .05$. This effect aligns with several previous studies (see, e.g., McMillan, Hoban, Clifford, & Brant, 1997) that argue younger people and women typically hold greater concern for the environment than males or older members of the population. This idea is considered further in the Discussion section for Study 1.

control condition (all experimental conditions) but no such difference for participants in the control condition. Contrary to expectations, a significant difference was found in both conditions.

A repeated measures *t*-test found a significant difference between pre-prime ($M = 0.38$, $SD = 0.11$) and post-prime ($M = 0.42$, $SD = 0.08$) NEP scores for participants in the control condition ($t(46) = 4.20$, $p < .05$) and for participants in a combined non-control condition ($t(142) = 8.45$, $p < .05$; scores on the post-prime measure, $M = 0.42$, $SD = 0.08$, were significantly higher than scores on the pre-prime measure, $M = 0.37$, $SD = 0.10$). Since pre- and post-prime scores were significantly different for participants in either of these conditions, the results suggest that the priming manipulation did not have a significant influence on NEP scores. Figure 5 displays NEP scores by experimental condition and Figure 6 shows pre- and post-prime NEP scores between the control and non-control conditions.

Despite earlier analysis reporting a significant difference pre- and post-prime NEP scores (in the expected direction), subsequent analysis suggests this effect is not due to the messages contained in each experimental condition. Instead, the difference may be due to the wording used in each message – this point is addressed in greater detail in the Discussion section for Study 1, which now follows.

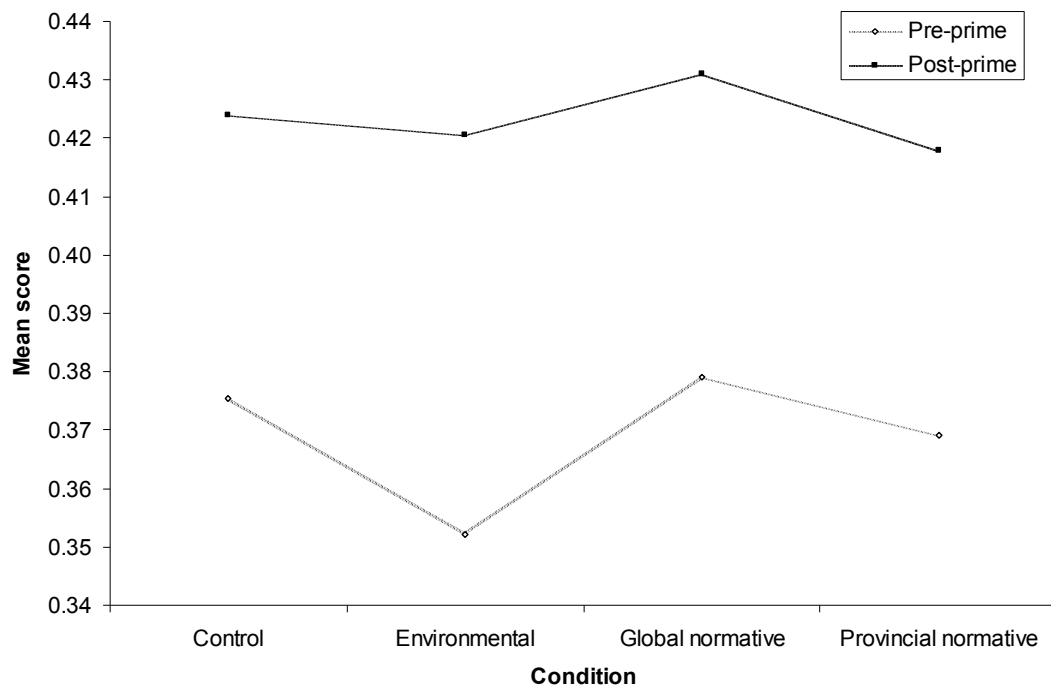


Figure 5. Environmental concern by experimental condition before and after the priming manipulation.

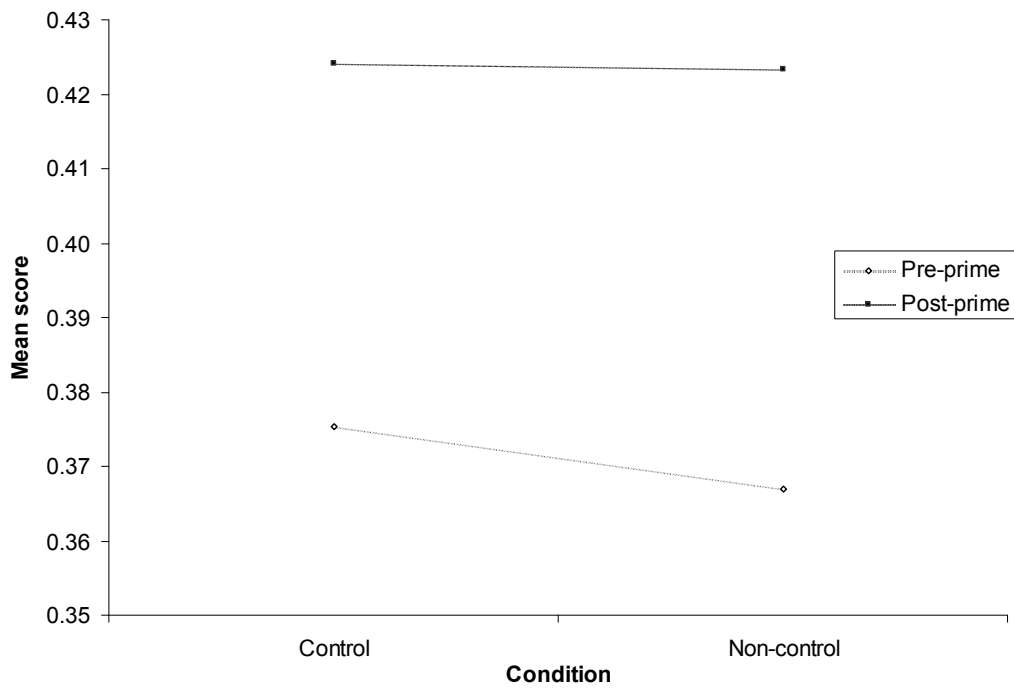


Figure 6. Environmental concern before and after the priming manipulation between the control and combined non-control conditions.

Discussion

Study 1 investigated the effect of four experimental conditions on participants' environmental concern and their willingness to engage in energy efficient behaviours. The findings regarding these two outcome variables will now be briefly discussed.

Self-reported energy efficiency

Overall, the presence of normative information led to greater willingness to engage in energy efficient behaviours. This finding supports the initial hypothesis regarding the effectiveness of these messages compared to other messages that rely solely on environmental responsibility. The results of the current study concur with those of previous literature, which argue that normative influence has a significant effect on an individual's behavioural choices (see, e.g., Borsari & Carey, 2001; Cialdini, 2001; Cialdini & Trost, 1998). Furthermore, they align with the results of previous research that employed social norm information as a method for promoting pro-environmental behaviour (see, e.g., Cialdini et al., 1990; Goldstein et al., 2008; Schultz, 1998; Schultz, Khazian, & Zaleski, 2008).

Contrary to predictions, no significant difference was reported between the four experimental conditions. Neither H_1 (an expected difference between control and environmental messages) nor H_2 (an expected difference between environmental and global normative messages) were supported. Despite these findings, there was a significant difference between the control condition (absent of any normative information) and the global normative condition. Participants reported a higher willingness to engage in energy efficient behaviours after being informed that many other New Zealanders engaged in such behaviour.

Participants in the global normative condition also had higher scores than those in the provincial normative condition. This finding did not support the expectations of H₃ (based on the results of Goldstein et al., 2008), which predicted that participants in the provincial normative condition would report a higher willingness to engage in energy efficient behaviours than their counterparts in the global normative condition. This result suggests that global normative information (e.g., relating to New Zealanders in general) has a greater effect on behaviour than normative information that is more specific (e.g., relating to Wellingtonians). This alternative finding is considered in more detail during the General Discussion section.

When considering the two dimensions of energy efficiency, the results suggest there may be notable differences between the effectiveness of normative information across the two types of household energy behaviour. Normative information had no significant effect on energy conservation (behaviours such as turning appliances or lights off when not in use) while, in contrast, energy efficiency (e.g., purchasing energy efficient appliances or installing efficient light bulbs) was significantly influenced by normative messages. These results suggest that energy efficiency behaviour may be a more responsive target to normative influence than energy conservation. This distinction between behaviours links to Stern's (2000) classification of private-sphere environmental behaviours. Stern separated household behaviours into the kind of action they correspond to. The energy dimensions of the current study relate to two specific dimensions: a) the purchase of household items that have a significant impact on the environment (energy efficiency) and b) the use of items that have a significant environmental impact (energy conservation). The findings of the current study support this

distinction and argue that normative influence may have a differing effectiveness on behaviours classified under Stern's category of private-sphere environmental behaviours. Future research is required to address this idea further.

Environmental concern (NEP Scale)

Experimental condition had no significant effect on pre- and post-prime NEP scores. Contrary to the expectations of H₄, normative influence did not have a significant effect on environmental concern. This unexpected result may be due to one of the following two explanations. First, participants may have been environmentally primed by the energy efficiency items placed before the post-prime NEP measure. Consequently, their view towards environmental conservation may have been positively slanted after completing the pro-environmental behaviour measure.

A second explanation may be the nature of the priming manipulation. Because part of the priming message (concerning the specific text placed before any normative information) contained information about the financial and environmental benefits of energy efficiency (*"choosing to manage the way you use energy means you can have lower power bills, a warmer, healthier home, and less of an impact on the environment"*), even participants exposed to no additional priming (i.e., those in the control condition) may have increased their environmental concern due to this standard message.

These two explanations may help to elucidate the increase in environmental concern for participants not only in the experimental conditions but also by those in the control condition. Further research is needed to rectify the potential limitations inherent in the priming manipulation and to further

investigate the effect of normative influence on increasing environmental concern. Although not specifically the focus of this study, future research should also provide greater consideration to the effect of demographic variables (such as age or gender) on environmental concern and the additional role such variables may have on the uptake of normative information. Such an investigation would contribute to an existing body of literature that investigates the role of socio-demographic variables on measures of environmental concern (see, e.g., McMillan et al., 1997; Scott & Willits, 1994) while contributing to research that links normative influence with pro-environmental behaviour.

As a whole, the results of Study 1 suggest that pro-environmental behaviour can be increased through the use of normative information. I conducted a second study to investigate this claim further by considering an additional type of pro-environmental behaviour set within a different context. This second study expanded on the methodology of Study 1 by using behavioural observations and not self-report measures. This eliminated the potential influence of response bias which is a common feature of research that relies on self-reports (Nederhof, 1985). Response bias such as impression management (the tendency for people to reflect more positively on themselves or their behaviour than is actually the case; Paulhus, 1991) may lead to respondents describing their pro-environmental behaviour as more frequent than is truly the case. For example, Corral-Verdugo (1997) reported a low correspondence between self-report measures and observed recycling behaviours. The methodology employed in Study 1 may have represented another instance of self-reports limiting the validity of participants' behavioural reports. By providing an additional methodology, Study 2 alleviates

the influence of self-reports which may have disguised the effect of normative influence regarding the results of Study 1.

Study 2 also extends on the findings of Study 1 by focusing on a more specific type of pro-environmental behaviour. Schultz and Kaiser (forthcoming) state that this approach may be more effective in eliciting behaviour-change than focusing on a broad range of behaviours (see also, McKenzie-Mohr, 2008) as was the case in Study 1. The results of Study 2 will provide further insight into the potential benefits of this approach. Finally, the organisational context of Study 2 will add to existing literature that demonstrates the usefulness of applying normative influence within practical, real-world contexts.

CHAPTER THREE: STUDY 2

Study 2

Study 2 drew on the theoretical basis of Study 1. The effectiveness of pro-environmental messages that included normative information was compared to conventional pleas that rely exclusively on environmental concern.

This study incorporated the results of previous research into normative influence and behaviour change by replicating and expanding on the aforementioned research conducted by Goldstein et al. (2008) and Schultz, Khazian and Zaleski (2008). These two studies adapted the content of hotel towel reuse pleas to include normative information. In both studies, greater towel reuse was recorded by guests presented with normative information compared to guests presented only with environmental-based information.

This previous research highlights the usefulness of utilising psychological research rather than relying on business practitioners' 'best guesses'. Hotel towel reuse programmes are of significant environmental benefit while having the added advantage of reducing the costs associated with chemical use, water use, and labour (Goldstein et al., 2008). Other than these direct financial benefits, hotels can promote themselves as environmentally friendly, serving to boost their moral status within the hospitality industry. As more and more consumers are rewarding organisations that take note of environmental issues (see, e.g., Carlson, Grove, & Kangun, 1993; Menon & Menon, 1997), the adoption of psychological research may be one way a hotel can improve its public image with regards to the environment.

Despite the organisational context of their studies, neither Goldstein et al. (2008) nor Schultz, Khazian and Zaleski (2008) gave much consideration to the organisational benefits that can be made through applying social norm research. Although their results may be small in a statistical sense, they may translate into

significant financial and ethical rewards for the organisation. There are numerous benefits associated with employing psychological research within an organisational setting and the realm of environmental conservation provides a vehicle for several of these advantages. As such, the current research expands on these two previous studies by providing a greater consideration of these potential advantages.

The current study investigated the effect of normative influence on individuals' tendencies to engage in the pro-environmental behaviour of towel reuse. Guests' towel reuse was compared across several conditions, some of which contained normative information while others drew solely on environmental concern. The following four conditions were used (the complete messages are provided below in the Method section for Study 2:

Control condition: *No normative or procedural towel reuse information.*

Environmental condition: *An environmentally-orientated message highlighting to guests the hotel's environmental conservation programme and procedural towel reuse information.*

Global normative condition: *A combined descriptive and injunctive global normative message and procedural towel reuse information.*

Normative condition paired with social reference group information: *A combined descriptive and injunctive normative message paired with a citizen reference group and procedural towel reuse information.*

The inclusion of a control condition provided a baseline level of towel reuse. This condition was reflective of guests' pro-environmental behaviour when not presented with any procedural reuse information. It enabled a point of reference for the effectiveness of the current industry standard (a message based on environmental conservation) and how it compares to the effectiveness of using no towel reuse information. The control condition used in the current study expands on the condition

used within previous research conducted by Goldstein et al. (2008) and Schultz, Khazian and Zaleski (2008). In this previous research, the control condition informed guests of the hotel's conservation programme (an environmentally-orientated message) and of where to place their towel should they wish to reuse it (procedural towel reuse information). Thus, they did not include a true control condition in their study. The current study uses a true control group in which guests were presented with no towel reuse information.

A combined descriptive and injunctive normative message was used across the normative conditions to expand on the findings of Schultz, Khazian and Zaleski (2008). This type of message has previously reported having the greatest effect on encouraging hotel guests' pro-environmental behaviour (Schultz, Khazian, & Zaleski, 2008), and is seen to be more powerful than presenting either descriptive or injunctive normative messages in isolation (Bosari & Carey, 2001; Göckertiz et al., 2010). This study investigates these claims by employing a combined normative message (congruent with the type of message used in Study 1).

Hotel guests in the experimental conditions were informed that the majority of other guests approve of and frequently engage in towel reuse behaviour.¹⁴ The inclusion of this normative information was expected to lead to greater towel reuse than the control condition and a standard environmental message, neither of which contained any information regarding the behaviour of other guests. In line with extant research, presenting individuals with descriptive and injunctive normative information was predicted to lead to greater towel reuse.

¹⁴ The exact frequency of this behaviour was determined by a pilot study that comprised a short period of preliminary data collection.

Alongside the effectiveness of the combined injunctive and descriptive normative message, I also considered the effect of the situational status of normative information. Drawing on the research of Schultz, Khazian and Zaleski (2008) and Goldstein et al. (2008), a global normative condition was manipulated by describing the towel reuse behaviour of the hotel's previous guests. This normative information was then compared to normative information pertaining to a social reference group (see below). As previous research has argued, the background or context of normative behaviour can play a significant role in an individual's uptake of normative information. Study 2 attempted to investigate this claim further while shedding light on the contrasting findings of Goldstein et al. (2008) and Schultz, Khazian and Zaleski (2008) regarding the effectiveness of situationally-based normative information.

Lastly, Study 2 also considered the effectiveness of normative messages paired with reference group information. This served to extend the findings of Goldstein and colleagues (2008) by providing further insight into the role of in-group and out-group membership on the influence of normative information. A citizen reference group was included with the expectation that this social identity would serve as a desirable in-group, encouraging participants to engage in the towel reuse behaviour modelled by other members of the reference group.

By incorporating these elements of normative information, the current study enabled the further application of social norm research linking normative influence with pro-environmental behaviour. Unlike Study 1, Study 2 contained a less artificial, more natural setting and was not reliant on participants' self-reports. The real-world context of Study 2 permits a greater consideration of the practical outcomes of the current research, further strengthening the perceived advantages of applying normative research within an organisational context.

Hypotheses

Along with considering the overall effectiveness of normative influence on encouraging pro-environmental behaviour, several hypotheses were made based on the predicted effectiveness of the four experimental conditions. These hypotheses are as follows:

H₁: *Guests in the environmental condition would show greater towel reuse than guests in the control condition.*

Without providing procedural information or highlighting the environmental consequences of towel disposal, it was expected that guests in the control condition would engage in less towel reuse than guests presented with procedural information and a plea for environmental conservation. This prediction provides insight into the current industry standard while dispelling the notion that no reuse message would be the most effective method for promoting towel reuse.

H₂: *Guests in the citizen reference group condition would show greater towel reuse than guests in the environmental condition.*

Consistent with the results of Goldstein et al. (2008) and Schultz, Khazian and Zaleski (2008), the hotel's standard environmental message was expected to produce a lower rate of towel reuse when compared to a message that paired normative information with a social reference group.

H₃: *Guests in the global normative condition would show greater towel reuse than guests in the environmental condition.*

This expectation reflects the results of previously mentioned research describing the effect of normative influence on behaviour. Knowledge about the behaviour of previous guests who have shared the same circumstances should have a powerful influence on current guests' towel reuse behaviour.

H₄: *Guests in the global normative condition would show greater towel reuse than guests in the citizen reference group condition.*

This prediction is consistent with the findings of Goldstein et al. (2008) who reported a marginally greater amount of reused towels for the global normative condition compared to the citizen identity condition. Guests should more strongly identify with the reference group with whom they share the same circumstances (i.e., previous guests) than with individuals deemed part of the citizen reference group. When looking to guides for their own behaviour, individuals look to others who share a similar environment or similar circumstances (Griskevicius et al., 2008). This should be reflected in a greater number of towels being reused by guests in the global normative condition.

Method

Participants

Demographic information

Participants were guests at a large hotel (111 rooms; approximately 50,000 guests annually) in the central business district of Wellington, New Zealand.¹⁵ Demographic information was collected using an optional survey administered to guests during their stay at the hotel. This survey was independent of the current research and was conducted between June 2009 and June 2010.¹⁶ Data collected during this time period provides some demographic information about the hotel's typical guests. 51.5% of hotel guests from the previous year were female, with 74.1% between the ages of 35-64. The majority of guests were residents of New Zealand

¹⁵ Several hotels were approached and given a hand-delivered letter requesting their participation in this study (see Appendix IV).

¹⁶ Data from June 2010 onwards had not been collected and therefore was not available at the time of this study.

(72.7%) with other significant percentages from Australia (13.6%) and the United Kingdom (4.9%). The majority of guests (53.4%) stayed at the hotel on weekdays only. Across all guests, 83% of stays were of 0-2 nights in length. No demographic information was collected from individual participants during the current study and participation was completely anonymous. Participants were not aware of any experiment taking place as their behaviour was seen as typical given the context.

Hotel rooms

One hundred and eleven rooms were used in the current study. All rooms were non-smoking. Each hotel room was randomly assigned to one of four experimental conditions; hotel management confirmed there was no preference for providing guests with some rooms over others. The current study measured how frequently guests reused their towels; therefore, only those who stayed more than one night provided eligible data. The final sample comprised of 170 stays. A 'stay' was determined as the first day of eligible reuse. Frequency analysis indicated that 49 cases were in the control condition, 26 in the environmental condition, 50 in the combined descriptive and injunctive normative condition, and 45 in the combined normative condition paired with reference group information. The frequency of these cases was determined by the random assignment of conditions to rooms.

Materials

Towel reuse messages

Written normative messages were printed on towel reuse cards similar to those frequently found in hotel bathrooms (Appendices V to VIII contain images of each message). Three of the four conditions used in the current study contained the printed

cards. The control condition did not require printed cards as no normative information or towel reuse instructions were presented to guests in this condition. Twenty-seven rooms were randomly assigned to the control condition.

The remaining three conditions used a double-sided printed card placed within the bathroom of each hotel room. Side A contained an environmentally orientated graphic and the slogan: *As guests of the Earth we welcome the world*. Side B contained instructions for towel reuse: *Would you like to reuse your towel? If so, please hang it on the towel rack*. The message printed on the card varied slightly depending on each experimental condition. The messages used for each condition are provided below.

Environmental message. Twenty-eight rooms were randomly assigned to this experimental condition. Guests were presented with environmentally-orientated information that requested them to reuse their towels out of respect for the environment:

Help save the environment. You can show your respect for nature and help save the environment by reusing your towels during your stay. Washing towels every day uses a lot of energy, so reusing your towels is one way you can conserve.

Global normative message. Twenty-eight rooms were randomly assigned to this condition. This message contained a combined injunctive and descriptive global normative message that highlighted the behaviour of previous hotel guests:

Many of our guests have expressed to us the importance of conserving energy. When given the opportunity, 70%¹⁷ of hotel guests choose to reuse their towels each day. Because so many guests value conservation and want to conserve, this hotel has initiated a conservation programme. Washing towels each day uses a lot of energy, so reusing your towels is one way you can conserve.

¹⁷ This information was gathered during a two-week phase of preliminary data collection.

Normative message paired with reference group information. Twenty-eight hotel rooms were randomly assigned to this condition. This condition contained social reference group information (i.e., fellow citizens) which was paired with a combined injunctive and descriptive normative message:

Join your fellow citizens in helping to save the environment. When given the opportunity, 70% of hotel guests choose to reuse their towels each day. Because so many guests value conservation and want to conserve, this hotel has initiated a conservation programme. You can join your fellow citizens and help save the environment by reusing your towels during your stay.

Data collection materials

Data collection sheets were created to enable housekeeping staff to record towel reuse information. These sheets included the date, staff members' initials, and the following information specific to each room: room number; number of guests staying in the room; check-in and check-out information; and the number of bath towels replaced and reused each day (see Appendix IX). Data collection sheets were designed for each floor of the hotel to make collection easier for the housekeeping staff. The sheets also reminded housekeeping staff to ensure that the towel reuse messages (Side B) were facing-up and in a visible location in the bathroom. This ensured each message was easily visible to hotel guests and in close proximity to the behaviour being conducted.

Procedure

This study was approved by the School of Psychology Human Ethics Committee under delegated authority of the Victoria University of Wellington Human Ethics Committee.

Baseline data

A two-week period of preliminary data collection was conducted before collecting the experimental data. The benefits of implementing this phase were threefold. First, it provided an opportunity to diagnose any collection problems which may serve as potential limitations of the data. Second, it provided housekeeping staff with the opportunity to become more accustomed to the procedure, particularly with what was required outside of their typical housekeeping duties. Finally, it provided baseline data which would form the basis of the normative information on the cards (relevant for experimental conditions three and four). After this two-week period, the researcher met with the hotel's Executive Housekeeper to confirm the data collection approach and ensure that the method was reliable when collecting data for the experimental stage of the study.

Experimental data

As described above, each of the 111 hotel rooms were randomly assigned to one of the four conditions. The messages were placed in the hotel rooms by housekeeping staff who were asked to follow clear instructions from the researcher. Each message was placed near the basin in the bathroom, within close proximity to the encouraged behaviour. Geller, Winett and Everett (1982) argue that behavioural prompts are most effective in changing behaviour when they are close to the point of decision-making. By placing the reuse messages in close proximity to an individual's decision to reuse, it was expected that the towel reuse messages would have a greater effect.

Regular meetings and visits from the researcher ensured placement of the reuse messages remained consistent over time and across each experimental condition.

Housekeeping staff collected towel reuse information on a daily basis as part of their general duties. Data were written on the collection sheets and gathered weekly by the researcher. Intermittent visits from the researcher and prompts from the Executive Housekeeper ensured staff were constantly reminded of the correct procedure for data collection and the importance of data accuracy. Towel reuse signs were placed in the hotel rooms during the first week of April until data collection concluded in the first week of August.

Results

Preliminary analyses

There were several cases where towel reuse was recorded as zero. This might have occurred for a number of reasons. For example, guests may have declined housekeeping service for that day. On the other hand, a score of zero may have reflected refusal to reuse any towels. It is useful to note that in the analysis provided, the exclusion of zero scores serves to weaken the effect sizes found. Therefore, reuse scores of zero were included (this is consistent with the methodology of Schultz, Khazian, & Zaleski, 2008).

Hotel staff would place a maximum of four towels in each room, but occasionally guests would request additional towels or use extra towels from the swimming pool / health club. Any data points larger than four were recoded (Winsorized) to the maximum number of four (again, consistent with the methodology of Schultz, Khazian, & Zaleski, 2008).¹⁸

Visual inspection of normal distribution curves and statistics for skewness and kurtosis revealed that the data were not normally distributed. As was the case in Study

¹⁸ For a discussion of Winsorized means, see Tukey (1977).

1, the skewness (.85; $SE = .19$) and kurtosis (.26; $SE = .37$) values were significantly greater than zero (indicating a positive skewness), which may undermine the statistical validity of later analyses (Field, 2009).

In support of this initial inspection, a Kolmogorov-Smirnov test indicated that towel reuse ($D(172) = .30, p < .05$) scores were not normally distributed. Subsequently, data scores were logarithmically transformed. This resulted in a mean number of towels reused of 0.30 ($SD = 0.20$) across all conditions. Transformed scores are presented in Table 4. Although all subsequent analysis was conducted with logarithmically transformed data, the raw, non-transformed scores are presented in Table 5 due to their practical application.

Table 4

Towel reuse statistics across all experimental conditions (transformed data)

	<i>n</i>	<i>M</i> ¹⁹	<i>SD</i>
Main conditions			
Control	49	0.238	0.22
Environmental	26	0.316	0.17
Global Normative	50	0.317	0.18
Normative with reference group	45	0.324	0.21
Grouping conditions			
Non-experimental (control)	49	0.238	0.22
Combined experimental	121	0.320	0.19
Combined non-normative	75	0.266	0.20
Combined normative	95	0.321	0.19
Total	170	0.296	0.20

Table 5

Towel reuse statistics across all experimental conditions (non-transformed data)

	<i>n</i>	<i>M</i>	<i>SD</i>
Main conditions			
Control	49	0.96	1.02
Environmental	26	1.22	0.85
Global Normative	50	1.26	0.94
Normative with reference group	45	1.35	1.10
Grouping conditions			
Non-experimental (control)	49	0.96	1.02
Combined experimental	121	1.28	0.98
Combined non-normative	75	1.05	0.96
Combined normative	95	1.30	1.02
Total	170	1.19	1.00

¹⁹ Unlike the other tables presented, three decimal places are provided in this table to adequately distinguish between the mean scores for each condition.

Effectiveness of normative messages

Statistical analysis was conducted to compare the effectiveness of containing normative information within reuse messages. First, a significant difference was found between the combined normative condition (global normative condition combined with normative reference group condition; $n = 95$) and the control condition ($t(143) = -2.33, p < .05$). Guests in the combined normative condition ($M = 0.32, SD = 0.19$) reused significantly more towels than guests in the control condition ($M = 0.24, SD = 0.22$). The use of a message containing normative information led to greater towel reuse than not using any towel reuse message. While this finding affirms the use of a normative message, the lower towel reuse scores for guests in the control condition may be due to the absence of procedural information, not necessarily due to an absence of normative information (this point is addressed later in more detail). I conducted additional analysis to investigate this claim further.

The combined normative condition was compared with a combined non-normative condition (control condition and environmental message; $n = 75$). There was a marginally significant difference between conditions for towel reuse ($t(170) = -1.80, p = .07$).²⁰ Marginally more towels were reused by guests in the combined normative condition ($M = 0.32, SD = 0.19$) than guests in the combined non-normative condition ($M = 0.27, SD = 0.20$). Although only marginally statistically significant, the inclusion of normative information in towel reuse pleas led to significantly more

²⁰ Sample size analysis indicated that to reach a 5% significance level, each condition would need at least 194 data points (315 data points for each condition at the 1% significance level). This calculation was based on the recommendations of Cohen (1992), who argued that statistical analysis should apply an 80% chance of detecting a given effect if it is present. This translates to a 20% probability of failing to detect a genuine effect (see also, Field, 2009). Sample size calculations were made using software available from www.dssresearch.com.

towels being reused than the standard environmental message and true control condition.

The above results are consistent with those of previous research (e.g., Goldstein et al., 2008; Schultz, Khazian, & Zaleski, 2008), which argue that normative information has a significant influence on towel reuse compared to conventional messages (such as those that promote environmental or moral responsibility) that do not contain social norms.

Lastly, no significant difference was found between the combined normative condition and the environmental condition ($t(121) = -0.11, p > .05$). The inclusion of normative information did not lead to a significant difference in towel reuse compared to conventional towel reuse pleas that centre on environmental concern.

Taken together, the non-significant difference between a combined normative condition and the environmental condition suggests that the earlier results regarding the difference in towel reuse between the combined normative and non-normative conditions may be attributable to a lack of procedural information, rather than the inclusion of normative information. As the inclusion of social norms did not elicit significantly greater towel reuse compared to the environmental and control conditions (neither of which included social norm information), it can be stipulated that the aforementioned statistically significant difference between the combined normative conditions and the combined non-normative conditions was the result of an absence of procedural reuse information – the combined non-normative condition incorporated the control condition which did not contain any instructions for towel reuse. This notion is reinforced by the mean reuse score being the lowest for the control condition, the only condition that did not incorporate procedural information (see Table 4).

Effectiveness of the four experimental conditions

A between-subjects one-way ANOVA examined the effectiveness of each experimental condition in encouraging guests' towel reuse.²¹ Contrary to expectations, no significant difference was found across all conditions ($F(3, 168) = 2.00, p > .05$). Towel reuse scores did not significantly vary across the four experimental conditions.

Although no significant statistical differences were found between conditions, an examination of descriptive statistics indicated towel reuse means were in the expected direction (see Figure 7). Consistent with initial predictions, the mean number of towels reused across each condition did vary based on the effectiveness of each reuse message. First, in agreement with H_1 , the control condition recorded the lowest mean of reuse ($M = 0.24; SD = 0.22$). Second, the standard environmental condition reported a higher mean ($M = 0.316; SD = 0.17$) than the control condition, but remained lower than both normative conditions (H_2 and H_3). Third (although not in accordance with H_4), the condition which paired normative information with the citizen reference group ($M = 0.324; SD = 0.21$) reported a higher reuse mean than the global normative message ($M = 0.317; SD = 0.18$). This finding is not in accordance with the expectations of H_4 . Overall, these results indicate an expected difference in towel reuse scores across the experimental conditions and show that the presence of normative information led to higher scores for towel reuse.

²¹ A Levene's test deemed the variances equal for towel reuse ($F(3, 168) = 2.47, p > .05$).

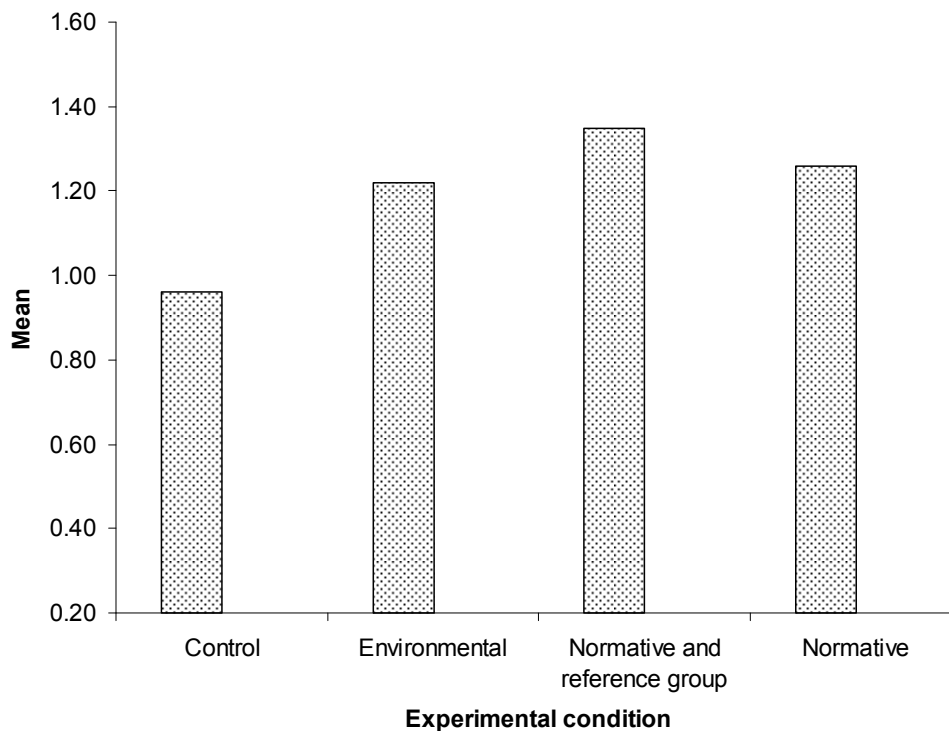


Figure 7. Towel reuse means by experimental condition (non-transformed data).

This claim was further reinforced through two independent samples *t*-tests. First, there was a significant difference ($t(97) = -1.95, p < .05$) in towel reuse scores between the control condition ($M = 0.24, SD = 0.22$) and the global normative condition ($M = 0.32, SD = 0.18$). Guests in the normative condition reused significantly more towels than guests not presented with any normative or towel reuse information. Second, there was a significant difference ($t(93) = -1.99, p < .05$) between the towel reuse frequency of guests in the control condition ($M = 0.24, SD = 0.22$) and reference group condition ($M = 0.32, SD = 0.21$). Again, guests in the control condition had significantly lower reuse scores than guests in the normative condition. Although these differences may be a function of the absence of any reuse message (not solely due to the inclusion of normative information), comparisons between the control condition and environmental condition partially rule out this explanation. No significant difference was reported for towel reuse scores between the

control and environmental conditions: $t(74) = -1.61, p > .05$. This suggests that the low reuse mean of the control condition is not solely due to the absence of procedural information; the inclusion of normative information plays an additional role.

Overall, these findings concur with initial predictions. The inclusion of normative information had a positive influence on towel reuse: Incorporating normative information into towel reuse pleas led to a greater occurrence of pro-environmental behaviour. This finding is in agreement with previous research associating normative influence with an increase in pro-environmental behaviours. Moreover, it suggests that the incorporation of social norms into towel reuse messages may be more beneficial than the use of messages that rely solely on environmental responsibility. Complete statistics regarding towel reuse for each condition are reported in Table 4.

Effectiveness of utilising reuse messages

I conducted additional analysis to compare the effect of using a towel reuse message versus using no reuse message. In order to do this, I compared the control condition (no reuse message; $n = 49$) with a combined experimental condition (all remaining conditions; $n = 121$). As expected, there was a significant difference between the conditions ($t(170) = -2.45, p < .05$). A greater number of towels were reused in the combined experimental condition ($M = 0.32; SD = 0.19$) compared to the control condition ($M = 0.24; SD = 0.22$). These results show that employing towel reuse messages leads to a greater number of reused towels than no reuse message at all (see Table 4 for the descriptives of these two conditions and Figure 8 for a graphical representation of the means). This finding affirms the current industry procedure for

using towel reuse messages. Ultimately, guests reused more towels if a reuse message was placed in their hotel room.

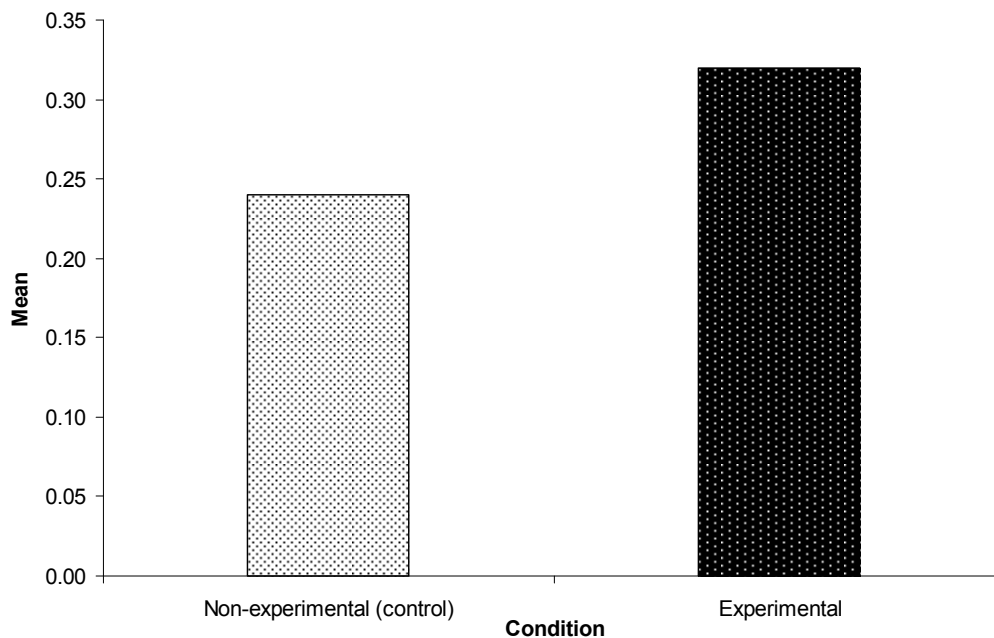


Figure 8. Towel reuse means between the control condition and combined experimental condition.

Consideration of data clustering

Data points at one level of analysis (i.e., individual cases) often become nested or clustered together at another level (Nezlek, 2008). Clustering involves the combination of observations into groups and may lead to data within one cluster being more similar to each other than those contained within a separate cluster (Jain, Murty, & Flynn, 1999). The data from this study form a clustering effect because towel reuse observations are clustered by hotel room. A clustering effect by hotel room has the potential to violate assumptions of independence, and may be a confounding factor due to the similarity of data points that share the same hotel room.

Similar research conducted by Schultz, Khazian and Zaleski (2008) employed Hierarchical Linear Modelling to assess the effect of data clustering. Regrettably, the

current research could not employ this procedure because of the nature of the data collected; few data points were clustered within the same room (approximately 20% of the total data collected), with several sourced from independent rooms. An alternative approach of aggregating the data by room would have again produced too few data points, deeming this methodology statistically inadequate.

Discussion

Overall, and in line with the results of Study 1, the results of Study 2 indicated that the inclusion of normative information led to a greater occurrence of towel reuse compared to towel reuse messages that did not include normative information. This finding supports initial predictions concerning the effectiveness of normative influence in encouraging pro-environmental behaviour. Specific findings will be discussed in greater detail below.

The results support the notion that any reuse message is better than no message. More importantly, the most effective type of message is one that draws on normative information, a result that is congruent with those of other studies (see, e.g., Goldstein et al., 2008; Schultz, Khazian, & Zaleski, 2008). Guests exposed to the normative message reused more towels than their counterparts in the non-normative conditions (which included the industry-standard environmental message). The current findings add to a growing body of literature on the use of social norms in fostering pro-environmental behaviour (see, e.g., Cialdini et al., 1990; Nolan et al., 2008; Schultz, 1998; Schultz et al., 2007).

A comparison of the mean reuse scores across experimental conditions tends to support initial predictions. First, the standard environmental message led to greater towel reuse than no towel reuse message (H_1). This affirms the current industry

standard and the procedure presently used within the hotel. Second, guests in the normative condition paired with social reference group information reused more towels than guests exposed to the standard environmental message (H_2). Third, guests in the global normative condition recorded higher towel reuse than those in the standard environmental condition (H_3). The results pertaining to H_2 and H_3 are consistent with the results of previous literature. Several past studies have reported that the information transmitted in social norms can have a large bearing on how an individual behaves, with such influence being more significant than environmental appeals (see, e.g., Borsari & Carey, 2001; Cialdini, 2001; Cialdini & Trost, 1998). Furthermore, the results are consistent with Terry and Hogg's (1996) argument that individuals tend to define their own behaviour in terms of the group norm rather than their own personal characteristics. Guests at the hotel replicated the behaviour of previous guests who had reused their towels, using this behavioural knowledge as a guide for their own behaviour.

Contrary to the expectations of H_4 , guests informed of the normative behaviour of 'fellow citizens' had higher towel reuse scores than guests in the global normative information condition. This finding rivals that of Goldstein et al. (2008). In their study, a marginally greater amount of towel reuse was reported for participants exposed to a condition referencing previous guests at the hotel. Even though the behaviour of previous guests is highly context specific and has a strong link to the behavioural context, guests in the current study appeared to identify more strongly with members of the citizen reference group. However, it must be pointed out that Goldstein et al. (2008) used the reference group of previous guests who had occupied the same room as current guests, while my study employed the reference group of 'fellow citizens'. There may be an effect of the reference group efficacy or the strength of identification

individuals felt towards the social reference group. This idea is considered in more detail during the General Discussion section below.

Overall, the results of Study 2 reinforce the notion that normative information can be used to promote pro-environmental behaviour. Towel reuse messages that incorporate reuse information pertaining to other guests can be employed to encourage current guests to reuse their towels. Such an approach was seen to be more effective than current methods that rely solely on messages of environmental responsibility. Such an approach may prove more beneficial for the environment (and for hotels) if this methodology is adopted in the future.

CHAPTER FOUR: GENERAL DISCUSSION

General Discussion

The current research demonstrates the effectiveness of using normative influence to promote pro-environmental behaviour. Across two experiments, the presentation of social norm information (i.e., behaviour believed to be frequently conducted and socially approved) led to more pro-environmental behaviour than pleas for behaviour change that drew on environmental responsibility or environmental conservation. This effect was demonstrated using two methodologies and two types of pro-environmental behaviour: self-reported willingness to engage in household energy efficiency (Study 1) and a direct behavioural measure of towel reuse amongst hotel guests (Study 2).

The findings of the current research share similarities with several previous studies that amalgamate social norm research with pro-environmental behaviour. Energy conservation appeals that included normative messages have reported a significant decrease in household energy use (see, e.g., Göckeritz et al., 2010; Nolan et al., 2008; Schultz et al., 2007), with similar effects being reported for recycling (see, e.g., Schultz, 1998) and littering behaviours (see, e.g., Cialdini et al., 1990). The findings of the current research reinforce a growing body of literature that demonstrates a beneficial effect of normative information on encouraging pro-environmental behaviour. Moreover, they add to existing literature that argues the use of social norm information is more effective than environmental pleas that are solely information driven (see, e.g., Abrahamse et al., 2005; Nolan et al., 2008; Schultz, 1998; Schultz & Kaiser, forthcoming).

Theoretical implications

Dimensions of pro-environmental behaviour

The results of Study 1 contribute to Stern's (2000) categorisation of environmental behaviour (see also Schultz & Kaiser, forthcoming). The two dimensions of household energy behaviours (energy efficiency and energy conservation) fall into Stern's category of private-sphere environmentalism. Furthermore, these two dimensions relate to the distinction between efficiency and curtailment behaviours (Stern & Gardner, 1981). These two behavioural dimensions are closely related to the energy dimensions reported in the current study. Curtailment refers to a reduction in the use of energy through such behaviours as reducing the temperature of one's hot water or not leaving lights on all night. The other dimension – efficiency – considers behaviours such as buying more efficient appliances or replacing refrigerator seals (for further examples see Stern & Gardner, 1981).

The contrasting effect of normative influence on each type of energy dimension within the current study lends support to the suggestion that different types of private-sphere behaviours may be determined by different factors and should be treated separately (see, e.g., Black, Stern & Elworth, 1985). The current research identifies a stronger effect of normative influence upon energy efficiency behaviours compared to energy conservation (or curtailment) behaviours. This finding, in particular, suggests that environmental behaviours should be classified by type and not treated as one overall behavioural domain (see, e.g., Stern, 2000; Stern & Gardner, 1981).

The findings of the current study have widespread implications for the design and implementation of behaviour change initiatives that specifically target household energy efficiency. When considering each dimension of energy use, behaviour change

programmes that specifically target efficiency behaviours should look to include normative information. In line with the current results, this approach may have a beneficial impact on reducing energy use and creating positive environmental outcomes. In contrast, an alternative approach may be required to successfully promote energy conservation behaviours. This point is addressed further in the discussion regarding future research directions.

Personal norms

The methodology and results of the current research relate to a distinction in the literature between personal norms and social norms. Personal norms are the result of internalised social norms, leading to social sanctions being manifested as personal feelings such as guilt and shame (Biel & Thøgersen, 2007; Schultz, 1998). In contrast to the external reference point of social norms, personal norms relate to internalised self-expectations and a sense of moral obligation to act in a particular way given the situational context (Corral-Verdugo & Frías-Armenta, 2006; Parker, Manstead, & Stradling, 1995; White et al., 2009). Despite numerous researchers demonstrating a significant, positive association between social norms and pro-environmental behaviour, other researchers argue that this relationship may instead stem from the influence of personal norms.

For example, White et al. (2009) postulated that the activation of personal norms may be enough to promote a behavioural response without having to draw upon social influences. They argue that a sense of moral obligation (e.g., for environmental protection) may be adequate for inducing pro-environmental behaviour with no need for social pressures (see also, Bamberg, Hunecke, & Blöbaum, 2007). The results of the current research contest this argument. If moral obligation plays such a crucial role

in behavioural choice, the environmental pleas used in the current research should have elicited greater pro-environmental behaviour than what was reported. Instead, it was the inclusion of normative influence that led to higher occurrences of pro-environmental behaviour. Therefore, social norms appear to have a greater effect on the encouragement of pro-environmental behaviour than White and colleagues give credit for. However, this argument is only tentatively posed as the current research did not specifically investigate the role of personal norms. Given the increasing global concern for environmental issues, moral influence and personal norms may yet prove an important source of influence for encouraging pro-environmental behaviour. Future research would benefit from testing this assumption further.

Social reference group

Study 1 reported higher scores of pro-environmental behaviour for participants in the global normative condition (i.e., with reference to the behaviour of New Zealanders in general) compared to those in the provincial normative condition (i.e., referencing the behaviour of Wellingtonians). This result was contrary to initial predictions as it was expected that the provincial normative condition would elicit greater pro-environmental behaviour due to the geographic similarity of participants with the provincial reference group.

These alternative findings may be explained by the salience of the reference group. When reference group information is made salient, the norms of the group should strongly influence behavioural decision-making. This is due to the psychological processes involved in aligning one's own identity with that of the group (see, e.g., Tajfel & Turner, 1979, 1986; Terry & Hogg, 1996; Turner et al., 1987). The unexpected results of the current research may be due to a lack of reference group

salience. Subsequently, the norms of the reference group would not have affected participants' own behaviour, and the normative information relating to a more general group (e.g., New Zealanders) may have had a greater effect.

The strength of the reference group may have been further reduced by the type of behaviours chosen for the current research. Household energy use and towel reuse can be deemed as private-sphere behaviours – again, following Stern's (2000) classification – and may be less susceptible to the influence of social reference group information than behaviours that are conducted in a public setting. For example, Rimal et al. (2005) posit that behaviours conducted within public view should be more susceptible to normative influence than behaviours conducted within private settings. The private-sphere behaviours used in the current study may have lessened the effect of the social reference group (and subsequent conformity to group behaviours) compared to behaviours that are typically conducted in more public settings.

Goldstein et al. (2008) state that when designing appeals to change behaviour, the norms of a reference group need to be as similar as possible to the circumstances of the intended audience. The provincial reference group of Wellingtonians may have been too broad to serve as a reference group that participants felt they could strongly identify with. For example, Rimal and Real (2005) argue that the strength of injunctive normative information becomes stronger as an individual's identity with a reference group increases; people want to be seen as conforming to the expectations of group members. This theory is reinforced in research conducted by White et al. (2009), which reported that the perception of family pressure to recycle had a significant, positive effect on recycling behaviour.

Within the hotel context of Study 2, guests appeared to align themselves more strongly with the norms of a 'fellow citizens' reference group even though the

behaviour of previous guests at the hotel is highly relevant to their current context. This unexpected finding may be due to the following explanations. First, guests may have typically identified the ‘fellow citizens’ group as previous guests at the hotel, instead of focusing on the social membership of citizen which the reference group sought to elucidate. This would have undermined the effect of the previous guests reference group. Second, as Goldstein (2010) points out, previous guests of a hotel are not necessarily seen in a positive light. These previous guests may be viewed as ultimately having reduced the quality of the rooms in the hotel through such behaviours as staining the carpet or marking the walls. Ultimately, the situationally-based normative information may not have had a strong enough association with the context to influence the towel reuse behaviour of current guests. This suggestion aligns with Aarts and Dijksterhuis’ (2003) notion that only situational norms that are well-established are automatically used to guide behaviour. Guests in the current study may not have adopted the normative information regarding previous guests at the hotel due to the alignment with the situational context being too weak or a lack of willingness to identify with the behaviour of previous guests.

The results of the current research indicate that participants identified more with the reference group of New Zealanders (Study 1) or ‘fellow citizens’ (Study 2). Contrary to initial expectations, participants identified more with a broader social category compared to one that was more specific. This unexpected finding may be partly explained by Schultz, Tabanico and Rendón’s (2008) discussion of the role of social reference groups. They argued that a generic reference group provides satisfactory motivation for an individual to conform to group behaviours and that increasing the strength of identification with the reference group does not significantly increase its influence. This point is further reinforced by the results of additional

research which argue that higher identification with a reference group does not necessarily lead to normative information having a greater impact on behaviour (see, e.g., Goldstein et al., 2007; Rimal et al., 2005).

While this may be a useful explanation for the results of the current research, future studies should consider including a measure assessing participants' efficacy towards social reference groups. In a similar study to Study 2 of the current research, Goldstein et al. (2008) included a pilot measure assessing perceptions towards the relevant group used in their research. This measure allowed them to examine the effect each of their towel reuse appeals had on activating the intended social reference group, while also providing a measure of how strongly participants identified with the reference group. The inclusion of such a measure in the current research would have provided a more thorough analysis of the effect of social reference group information, while confirming the methodology used was sufficient in eliciting identification with each reference group.

The alignment of social reference group information with normative influence is particularly important in the domain of environmental behaviour, as there is a necessity for members of the public to take personal responsibility for what are ultimately group-level outcomes (Clayton & Myers, 2009). A greater discussion of the role of social reference group information is presented in the Limitations and Future Research sections provided below.

The attitude-behaviour gap

When asked, individuals typically state that environmental protection is the main reason for their pro-environmental behaviour (Schultz & Kaiser, forthcoming). However, messages that focus on the environmental benefits of behaviour change

typically fail to elicit changes in behaviour (Schultz & Kaiser, forthcoming; Schultz, Khazian, & Zaleski, 2008). One explanation for this inconsistency is the attitude-behaviour gap, or the discrepancy between holding environmental knowledge without this knowledge translating to pro-environmental behaviour. This discrepancy has been extensively researched within environmental psychology (Kaiser et al., 1999) leading to several theoretical models that attempt to explain this gap. Early models focused on increasing knowledge and awareness, but with little effect. This is the approach typically taken today (Kollmuss & Agyeman, 2002), despite numerous research examples demonstrating its ineffectiveness in eliciting behaviour change (see McKenzie-Mohr, 2000; Schultz & Kaiser, forthcoming). More recent theoretical models consider factors such as altruism (e.g., Stern, Dietz, & Kalof, 1993) or emotion (e.g., Vining, 1992), including Kollmuss and Agyeman's (2002) term 'pro-environmental consciousness' which encompasses environmental knowledge, values, attitudes, emotional involvement and other factors such as personality traits and socio-cultural factors.

Ajzen's (1991) theory of planned behaviour (TPB) is one additional model that can be used to understand the gap between pro-environmental attitudes and pro-environmental behaviours. The TPB is an extension of the theory of reasoned action initially proposed by Fishbein and Ajzen (1975, 1980). This original theory posits that if an individual perceives behaviour as accepted by a social reference group (i.e., exhibited via an injunctive norm) they become more motivated to engage in the particular behaviour. The TPB extends the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) by introducing the concept of perceived behavioural control – an individual's perception that they can competently conduct a particular behaviour. The TPB proposes that behavioural intention is the most

significant precursor of behaviour, and is predicted by attitude, injunctive normative influence, and perceived behavioural competency (Heath & Gifford, 2002). Within this theory, social norms serve as an important source of motivation. Although not specifically testing the TPB, the findings of the current research support the specific normative component of this theory by reinforcing the role of normative influence in the link between attitudes and behaviour. Provided an individual perceives such behaviour as positive and believes they can engage in a particular pro-environmental action with relative ease, the introduction of normative information should lead to their engagement in such behaviour.

The results of the current research align with several previous studies that specifically test the role of the TPB in encouraging pro-environmental behaviour. For example, Mannetti, Pierro and Livi (2004) showed that normative influence was a significant predictor of recycling behaviour (although the strongest predictor was perceived behavioural control). This effect may have been even greater if their results were not limited by the use of self-report measures. This methodology may have led to participants underestimating the role of normative influence on determining their own behaviour. This would be consistent with previous research that reports individuals misattribute the effect of other people on their own behaviour (see e.g., Cialdini et al., 1990).

One additional model that attempts to explain the attitude – behaviour gap is Campbell's paradigm (see, e.g., Kaiser, Byrka, & Hartig, 2010). This model argues that an individual's motivation to engage in pro-environmental behaviour can be understood from the behaviours they display (Schultz & Kaiser, forthcoming). Therefore, an individual who is more motivated to engage in a given behaviour will conquer more barriers (e.g., cost, time, distance) to that behaviour. For example,

within the realm of environmental behaviour, an individual who is more motivated to take public transport instead of using their car will conquer more barriers to this behaviour than someone who is less motivated. Following this reasoning, initiatives designed to promote pro-environmental behaviour can focus on two approaches: (1) reduce barriers to pro-environmental behaviour or (2) increase personal motivation. The current research suggests that the use of social norms may be one method for increasing personal motivation. By presenting individuals with descriptive and injunctive normative information, they become more motivated to engage in pro-environmental behaviour. The results of the current research support the theoretical model proposed by Campbell's paradigm and the potential application it may have for behaviour change. However, future research is needed to more thoroughly test the role of normative influence in this model.

New Zealand context

New Zealand is seen as a 'clean and green' country, high in environmental concern and a nationwide desire to preserve and maintain the natural environment. The latest environmental performance index rankings (based on several indicators covering factors such as environmental public health and ecosystem vitality) place New Zealand 15th highest out of 163 countries (Yale University, 2010). This national pro-environmental mindset may have affected participants' responses in the current research (particularly Study 1). New Zealanders may already be highly concerned for the environment so the presentation of an environmental prime may have served to increase self-reports for pro-environmental behaviour to a greater extent than was predicted. For example, if an individual believes pro-environmental behaviour is personally and morally beneficial they will make more of an effort to preserve the

environment (Corral-Verdugo & Frías-Armenta, 2006). New Zealand's national mindset to promote environmental conservation may have reduced the expected effect of normative information by leading to greater instances of pro-environmental behaviour than what might be reported in other samples.

In a study investigating the European hotel industry, Bohdanowicz (2006) reported that factors such as the economic and socio-cultural context of a country have a significant influence on the environmental attitudes of hotel operators and the subsequent initiation of pro-environmental initiatives. Bohdanowicz showed that when set amongst the 'green' image of Scandinavian countries such as Sweden, the attitudes and subsequent pro-environmental behaviours of hoteliers reflected a strong nationwide belief in environmental conservation. Bohdanowicz's findings suggest that context can play a significant role on environmental concern and subsequent behaviours. Additional research is needed within a New Zealand context to investigate the significance of New Zealand's nationwide concern for the environment and the possible influence this has on the effectiveness of environmental appeals and behaviour-change initiatives that include normative information.

The mere exposure effect

The mere exposure effect states that repeated exposure to a stimulus results in a greater liking of that stimulus (Zajonc, 1968). Several studies have demonstrated that participants tend to rate frequently seen objects or people as more favourable than novel objects (see, e.g., Bornstein, Leone & Galley, 1987; Gordon & Holyoak, 1983; Monahan, Murphy & Zajonc, 2000). This effect even extends to unconscious, automatic processes (Bornstein & D'Agostino, 1992; Gordon & Holyoak, 1983).

This argument can be used as an alternative explanation for the results of the current research. Due to the increasing focus on environmental conservation (e.g, recycling, energy conservation, water conservation) seen within New Zealand and globally, participants' previous exposure to environmental messages may have significantly influenced the effectiveness of the environmental messages used in the current study. For example, when reading the environmental prime used in the current study, participants may have recalled television commercials (such as EECA's energywise campaign) that promote pro-environmental behaviour. The mere exposure effect argues that this prior exposure may have led to participants attributing positive emotions to the environmental message, subsequently leading them to provide higher intentions for energy efficiency behaviours compared to the normative messages which were not susceptible to the mere exposure effect.

The mere exposure effect has not only been reported with stimuli of similar context, but also novel stimuli. For example, Gordon and Holyoak (1983) found that liking increased for previously presented stimuli and for novel stimuli (see also Monahan et al., 2000). Research such as this suggests that the positive associations created through pro-environmental messages (such as those seen on television commercials) may extend to novel stimuli such as those presented in the current research. This may help to explain why the environmental messages used in the current study were more effective than was anticipated based on the results of previous research.

Practical applications

The notion that normative information can be used to promote pro-environmental behaviour has implications for the use of current messages that rely on

environmental concern. These current messages typically have little effect on behaviour (see, e.g., Gardner & Stern, 2002; Schultz, 1998; Schultz & Kaiser, forthcoming). However, the results of the current research demonstrate that utilising the persuasive power of normative influence is a more effective approach for promoting behaviour change. Since environmental concern is increasing in prominence, this suggestion could be adopted by policy developers to more effectively encourage pro-environmental behaviours. As such, it is important that the psychological knowledge inherent in successful behaviour change initiatives is accessible at the point of policy development and implementation (McKenzie-Mohr, 2000). More specific applications are now discussed with relevance to the behavioural domain they are most strongly associated with.

Household applications

Although the results of the current study show only small statistical differences, even slight changes in behaviour may translate into significant effects on a large scale. For example, the effect of a behaviour-change intervention on household energy use (such as Study 1) may lead to considerable financial and environmental reductions if the intervention promotes pro-environmental behaviour on a large scale. EECA (2010) reports New Zealander's spend approximately \$3000 a year on household energy, equating to approximately 1.5 tonnes of carbon dioxide emissions per household per year. If conventional, education-based messages draw on the current findings and consider including normative information into pro-environmental behaviour change programmes, there may be significant large scale reductions in the cost of energy for both individuals and the environment.

Organisational applications

Due to the specific services they provide, hotels consume considerable amounts of water and energy (Bohdanowicz, 2006). By incorporating normative information into pre-existing towel reuse messages, hotels may make significant environmental and financial savings. Based on research by Six Continents Hotels (SCH; 2001), on average, a 150 room hotel can save approximately 23,000 litres of water and 150 litres of detergent per month from actively engaging in a towel and linen reuse programme. Furthermore, Goldstein (2010) suggested that hotels can save up to US\$1.50 per night when implementing towel reuse pleas. The results of the current research suggest that this saving may be even greater if the messages eliciting involvement in these programmes consider including normative influence. Although towel reuse differences within the current research were small in a statistical sense, if a large number of hotel guests engage in reuse behaviours, the size of these differences become considerably magnified.

The current research demonstrates the advantages of linking psychological research with the hospitality industry. Bohdanowicz (2006) argued there is a need for greater cooperation between the hospitality sector and psychological researchers so that new initiatives can be developed and implemented. However, there is one major barrier to the successful application of the current findings within a hotel context. Many hotel guests may perceive water and electrical resources as limitless or inexhaustible during their stay (Schott, Reisinger & Milfont, forthcoming). This forms a strong barrier to creating sustainable pro-environmental behaviours within the tourism industry. Even pro-environmentally orientated individuals who limit water and chemical use at home may relax their behaviour within a hotel context and ignore considerations relating to the water or chemicals they use during their stay. In

addition, individuals may feel they have already paid money to stay in the hotel and do not want to give the hotel more money by declining maid service or fresh towels. These barriers to pro-environmental behaviour must be overcome in order to successfully promote behaviours that benefit hotels and the environment. The findings of the current research may help to break these barriers. Normative influence may serve as a motivational factor encouraging guests to engage in pro-environmental behaviour despite their preconceptions regarding the availability of resources or the financial interests of their hotel.

The application of the current findings is not limited to household or hotel contexts. Consumers are more likely to favour companies they perceive as being responsive to environmental concerns (Carlson et al., 1993). This notion aligns with the concept of 'green consumerism' (see, e.g., Gussow, 1989), in which consumers are motivated to buy products and services out of a desire for environmental conservation (Carlson et al., 1993). Within New Zealand, the Qualmark brand is associated with environmentally responsible tourism (www.qualmark.co.nz). To meet the Qualmark 'quality assured' standard, participating accommodation, transport and other tourism service facilities must meet minimum requirements in areas such as energy efficiency, water conservation, waste management, conservation initiatives, and community activities.

While the Qualmark brand predominantly has an environmental purpose, it also provides organisations with the opportunity to promote themselves as pro-environmental. Simply making a profit and producing quality products is not enough to establish and maintain a positive image in the eye of the consumer (Mason, 1993); it is through environmental consideration that this positive image can be maintained, ensuring better visibility for an organisation within often competitive industries

(Menon & Menon, 1997). An organisation can highlight its concern for the environment by initiating solutions that extend beyond basic environmental regulations. Organisations that are seen to consider pro-environmental initiatives stand to benefit for improvements to their public image (see, e.g., Cohen, Fenn & Konar, 1995). Organisations within the hospitality industry have the potential to do this by implementing the results of the current study. This would not only lead to better outcomes for the environment but would increase the hotel's Qualmark standing and subsequent public image.

Although the greatest potential for widespread pro-environmental behaviour change may lie within the hospitality or tourism sector, the results of the current research can also have significant implications for household energy use. Despite such applications being smaller in their frequency, the implementation of such initiatives can serve to increase the salience of environmental issues (Gardner & Stern, 2002), which may have implications for a wider range of pro-environmental behaviours.

Limitations

A first limitation that specifically relates to Study 1 is the use of self-report measures. Previous research has identified this methodology as somewhat problematic within environmental research. For example, Corral-Verdugo (1997) reported low correlations between self-reported and observed recycling behaviours (see also McGuire, 1984; Terry & Hogg, 1996). This low correlation may also have featured within the current research. A social desirability bias may have led to participants responding more favourably about their pro-environmental behaviour than is truly the case. Because Study 1 did not contain an observational measure of behaviour, participants were not held accountable for the honesty of

their self-reports. Future research should look to include a behavioural measure alongside self-reports of pro-environmental behaviour while considering employing a measure of social desirability responding.

A first limitation relating to Study 2 is the small sample size. Among other things, small sample sizes may adversely affect the statistical power required to detect significant differences between groups (Cohen, 1988, 1992), undermining the validity of statistical analysis. The small sample size of the environmental condition may have contributed to the non-significant difference between the environmental and normative conditions in the current study. Previous research by Schultz, Khazian and Zaleski (2008) did report a significant difference between these conditions, but had a total sample size of 2359 – significantly greater than the sample size collected in the current research. The alternative findings of the current study may be due to the small sample size of the environmental condition; this may have inflated guests' towel reuse scores, presenting an unrepresentative mean score and not permitting statistically reliable mean comparisons. Future research requires a larger sample size to more thoroughly investigate these claims.

There may be three explanations for the small sample size of Study 2. First, guests may not have followed the correct procedure for reusing their towels despite clear procedural information. Instead of hanging their used towels on the towel rack they may have placed them elsewhere (e.g., on the bed), unwittingly indicating to housekeeping staff that they wanted their towels to be replaced. Second, several guests were not eligible for participation due to the duration of their stay. Although the hotel chosen for Study 2 was in a prominent, central city location, the average stage was for one night. Since towel reuse could only be measured for guests staying a minimum of two nights, any guests that did not stay

for this minimum were ineligible for the study. Third, towel reuse data may not have been properly recorded by hotel staff. Despite the best efforts of the researcher and the Executive Housekeeper to ensure that data were collected accurately and regularly, only limited data was available during the early stages of the experiment. Lastly, in future research, housekeeping staff should be instructed to record instances of guests' declining room service. This would provide a more thorough analysis of instances when towel reuse scores were zero.

A second limitation specifically relating to Study 2 is the inability to conduct multilevel analysis. As was previously mentioned, towel reuse data may have been clustered by hotel room, violating the independence of cases and undermining later analysis. In their study, Schultz, Khazian and Zaleski (2008) employed Hierarchical Linear Modelling to rectify this possible clustering effect. However, this assumption could not be thoroughly tested in the current research because of the size of the sample collected.

One final limitation that applies to both methodologies of Study 1 and Study 2 is the efficacy of the social reference group. As was previously discussed, participants may have not identified strongly enough with the social reference group for the introduction of normative information to significantly influence their behaviour. This may be due to a number of factors. For example, participants in Study 1 may have felt greater efficacy with the reference group of "New Zealanders" compared to "Wellingtonians". This would be particularly pronounced if participants were from outside the Wellington region and therefore did not desire to identify with the in-group of Wellingtonians. Future research could include a measure of reference group efficacy (in accordance with previous research by Goldstein et al., 2008). This would

demonstrate the suitability of including such reference groups and the strength of identification participants felt towards these reference groups.

Despite the above limitations, the current research offers findings that add to a growing body of literature aligning normative influence with pro-environmental behaviour change. Additional areas of research are now discussed along with suggestions to rectify the limitations of the current study.

Future research

The results of the current study offer several directions for future research which will now be considered.

The role of personal norms

One area for future research relates to the relationship between social norms and personal norms (see pp. 79-80 for a discussion on the relevance of personal norms). Future research could explore this relationship and its potential for promoting pro-environmental behaviour. For example, Thøgersen (2009) argues that the communication of social norms in isolation has limited behavioural impacts. There may therefore be a greater impact on behaviour if social norms are paired with personal norms. Future research could test this argument by including both types of norms into a behaviour-change programme. This would lead to behaviour change interventions that incorporate personal feelings of guilt or shame, while also considering the role of social approval on behavioural decision-making. The most effective behaviour intervention strategy may yet be one that includes social and personal normative influence. Future research should investigate this assumption further.

Reciprocity

Future research could investigate the impact of other factors on promoting pro-environmental behaviour within an organisational context. One of these factors may be the norm of reciprocity, or giving benefits back to people by way of returning a favour (Morales, 2005; see also Cialdini & Goldstein, 2003). Many organisations focus on reciprocity to encourage pro-environmental behaviour, and for good reason: There is a powerful sense of obligation to return a favour to someone who has previously done a favour for you (Cialdini & Goldstein, 2003; Goldstein, 2010). The norm of reciprocity is a crucial element in the maintenance of relationships, including those between consumers and companies (Goldstein et al., 2007; Morales, 2005). Within a hotel context, guests may reuse more towels if reuse messages describe environmental initiatives the hotel has already completed instead of describing those that will be completed provided an adequate number of guests reuse their towels. This latter approach may have a detrimental effect on reuse behaviour if consumers believe an organisation is being deliberately deceptive or driven by a desire to make financial gains (Morales, 2005). A reciprocity approach might alleviate any feelings of uncertainty guests feel about the true pro-environmental actions of a hotel. Future research should investigate this claim further while considering the possible influence of normative information. A more effective behaviour change initiative may prove to be one that includes normative information whilst simultaneously drawing on behavioural reciprocity.

Normative message framing

The current research described the behaviour of the majority (i.e., 75% of guests engage in towel reuse), giving no mention to minority group members. Instead of employing the approach used in this study (and in previous research: Goldstein et

al., 2008; Schultz, Khazian, & Zaleski, 2008), future research could describe the anti-environmental behaviour of the minority group (e.g., 25% of guests do not reuse their towels). Consequently, individuals may engage in pro-environmental behaviour out of a desire to differentiate themselves from members of the out-group. This would be consistent with previous research into social identity (see, e.g., Tajfel & Turner, 1979, 1986; Turner et al., 1987) and deviance regulation theory.

Deviance regulation theory (introduced by Blanton, Stuart & Vandenberg, 2001; see also Blanton & Christie, 2003) proposes that people evaluate and decide their own behaviour as an effect of the perceived social consequences that relate to behavioural deviance rather than on the basis of behavioural conformity. The theory argues that people are motivated to distinguish themselves from the group by choosing socially desirable ways to deviate from social norms while maintaining a favourable self-image (Schultz, Tabanico, & Rendón, 2008). Future research could consider the effect of deviance regulation theory in behaviour change programmes that include normative influence.

For example, if encouraging a particular pro-environmental behaviour, behaviour change initiatives could focus on the undesirable attributes of people that do not engage in the desired behaviour. If people are presented with normative information based on the minority group, their desire to avoid the consequences associated with behavioural deviance may serve as a strong motivational force to engage in the behaviour of the majority (see, e.g., Schultz, Tabanico, & Rendón, 2008). Behaviour change programmes that include this approach could be applied to pro-environmental behaviour and may prove effective in relation to public behaviours such as neighbourhood recycling or car use. Although likely to be successful in public settings, this approach may be counter-productive in private settings (e.g., promoting

household energy efficiency). In such settings, people may engage in the behaviour of the minority as their group compliance and behaviour conformity is not easily known by others. Future research could investigate this idea further, reporting on the comparative effectiveness of this approach compared to more conventional methods that use normative information by referencing the behaviour conducted by majority group members. Deviance regulation theory is one area of research that may have significant applications to behaviour change programmes that attempt to motivate behaviour, whether environmentally-orientated or otherwise.

Intergroup competition

An additional direction for future research could explore the effect of competition between social reference groups. Galvanising people under a common objective helps to increase group identity – an effect that may be further influenced by introducing competition with other groups (see, e.g., Bornstein, Gneezy & Nagel, 2002; Erev, Bornstein & Kalili, 1993). For example, an energy efficiency campaign that ignites a sense of competition between neighbourhoods may serve to galvanise residents under a shared objective. Individual households may then engage in more energy efficient behaviours due to the competition between neighbourhoods and feelings of in-group membership created among neighbours. This source of motivation may also extend to other household behaviours (such as recycling or water conservation), and may be successful in encouraging the two dimensions (energy efficiency and energy conservation) of household energy use that were identified in the current study. Furthermore, this approach would extend on several previous community-based studies that incorporate normative information into recycling or

energy and water conservation (see, e.g. Nolan et al., 2008; Schultz et al. 1998; Schultz et al., 2007).

Aligning social norms with group competition would extend the current research to pre-existing research regarding social loafing (see, e.g., Latané, Williams & Harkins, 1979; for a meta-analytical review see Karau & Williams, 1993). Social loafing is the tendency for individuals to put less effort into a collective task than they would if they were undertaking the task by themselves (Vaughan & Hogg, 2005). By combining normative influence with group competition, future research may develop new initiatives that prove effective in eliciting pro-environmental behaviour change while offering the potential to assuage the effects of social loafing.

Additional pro-environmental factors

Lastly, future research could assess the role of additional factors on the relationship between normative influence and pro-environmental behaviour. For example, past literature has shown a strong association between personal values and pro-environmental behaviour (see, e.g., Karp, 1996; Milfont, Sibley, & Duckitt, 2010; Schultz & Zelezny, 1998). Future research could consider the role of personality factors in moderating the relationship between social norms and pro-environmental behaviour. Such an investigation may report similar findings to those of Hirsh (2010). In his study, the personality traits of agreeableness and conscientiousness were significantly positively associated with greater environmental concern. These particular personality dimensions may be associated with a greater impact of normative influence – people high in these dimensions may be more affected by social norms than others. This may offer a more focused method of behaviour change which could target specific personality characteristics.

Additional research by Mainieri, Barnett, Valdero, Unipan, and Oskamp (1997) argued that people with stronger pro-environmental beliefs are more likely to engage in pro-environmental behaviours due to environmental considerations. It may be the case that individuals with higher pro-environmental beliefs are more susceptible to environmental messages that promote pro-environmental behaviour change. This suggestion relates to the earlier discussion regarding the role of a New Zealand context and the potential influence of the mere exposure effect. As past research has identified a strong association between environmental attitudes, personal norms, and personal values (Schultz & Kaiser, forthcoming), future research could look to include measures of these variables while considering the role of normative influence in pro-environmental behaviour change programmes.

CHAPTER FIVE: CONCLUSION

Conclusion

The results of the current research demonstrate that the introduction of normative influence serves to effectively promote pro-environmental behaviour. Across two experiments, participants presented with social norm information (i.e., information regarding the behaviour of others) reported greater willingness to engage in pro-environmental behaviour (Study 1) or directly performed more pro-environmental behaviour (Study 2) than those who were not presented with such information. These results are consistent with the findings of several previous studies that align normative influence with pro-environmental behaviour (Goldstein et al., 2008; Nolan et al., 2008; Schultz et al., 1998; Schultz et al., 2007; Schultz, Khazian, & Zaleski, 2008). Beyond mere replication, the current findings add to existing literature by considering a combined injunctive and descriptive normative message, a true control condition, and adapting the methods of previous research to a New Zealand context.

These results have considerable implications for current environmental pleas that rely solely on environmental responsibility. Instead of focusing on the frequency of anti-environmental behaviours, the results of this study suggest a more effective strategy could be found by focussing on instances of pro-environmental behaviour. By informing an individual that a particular behaviour is socially desirable and frequently conducted, the individual may elect to engage in the behaviour themselves, therefore changing their behaviour to suit that of the majority. Such behaviour change can have positive applications across several different contexts with the overarching advantage of being beneficial for the environment.

Given the large number of behaviours that impact on the environment, researchers need to explore interventions that can successfully promote pro-

environmental behaviours, not only in the short-term but also for the long-term future.

The current research is one step in this direction.

CHAPTER SIX: REFERENCES

References

- Aarts, H., & Dijksterhuis, A. (2003). The silence of the library: Environment, situational norm, and social behaviour. *Journal of Personality and Social Psychology*, 84(1), 18-28.
- Abrahamse, W., Steg, L., Vlek, C., Rothengatter, T. (2005). A review of intervention studies aimed at household energy conservation. *Journal of Environmental Psychology*, 25, 273-291.
- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes*, 50, 179-211.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour*. NJ, USA: Prentice-Hall.
- Axelrod, L. J., & Lehman, D. R. (1993). Responding to environmental concern: What factors guide individual action? *Journal of Environmental Psychology*, 13, 149-159.
- Bamberg, S., Hunecke, M., & Blöbaum, A. (2007). Social context, personal norms and the use of public transportation: Two field studies. *Journal of Environmental Psychology*, 27(3), 190-203.
- Bendor, J., & Swistak, P. (2001). The evolution of norms. *American Journal of Sociology*, 106(6), 1493-1545.
- Biel, A., & Thøgersen, J. (2007). Activation of social norms in social dilemmas: A review of the evidence and reflections on the implications for environmental behaviour. *Journal of Economic Psychology*, 28, 93-112.
- Black, J. S., Stern, P. C., & Elworth, J. T. (1985). Personal and contextual influences on household energy adaptations. *Journal of Applied Psychology*, 70(1), 3-21.

- Blanton, H., & Christie, C. (2003). Deviance regulation: A theory of action and identity. *Review of General Psychology*, 7(2), 115-149.
- Blanton, H., Stuart, A. E., & VandenEijnden, R. J. J. M. (2001). An introduction to deviance-regulation theory: The effect of behavioural norms on message framing. *Personality and Social Psychology Bulletin*, 27(7), 848-858.
- Bohdanowicz, P. (2006). Environmental awareness and initiatives in the Swedish and Polish hotel industries - survey results. *Hospitality Management*, 25, 662-682.
- Bornstein, G., Gneezy, U., & Nagel, R. (2002). The effect of intergroup competition on group coordination: An experimental study. *Games and Economic Behavior*, 41, 1-25.
- Bornstein, R. F., & D'Agostino, P. R. (1992). Stimulus recognition and the mere exposure effect. *Personality and Social Psychology*, 63(4), 545-552.
- Bornstein, R. F., Leone, D. R., & Galley, D. J. (1987). The generalizability of subliminal mere exposure effects: Influence of stimuli perceived without awareness on social behaviour. *Journal of Personality and Social Psychology*, 53, 1070-1079.
- Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, 13, 391-424.
- Carlson, L., Grove, S. J., & Kangun, N. (1993). A content analysis of environmental advertising claims: A matrix method approach. *Journal of Advertising*, 22(3), 27-38.
- Chen, X., Lupi, F., He, G., & Liu, J. (2009). Linking social norms to efficient conservation investment in payments for ecosystem services. *Proceedings of the National Academy of Sciences*, 106, 11812-11817.

- Christensen, P. N., Rothgerber, H., Wood, W., & Matz, D. C. (2004). Social norms and identity relevance: A motivational approach to normative behaviour. *Personality and Social Psychology Bulletin*, 30, 1295-1309.
- Cialdini, R. B. (2001). *Influence: Science and practice* (4th ed.). Boston: Allyn & Bacon.
- Cialdini, R. B. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Science*, 12(4), 105-109.
- Cialdini, R. B. (2005). Basic social influence is underestimated. *Psychological Inquiry*, 16(158-161).
- Cialdini, R. B. (2007). Descriptive social norms as underappreciated sources of social control. *Psychometrika*, 72(2), 263-268.
- Cialdini, R. B., & Goldstein, N. J. (2002). The science and practice of persuasion. *Cornell Hotel and Restaurant Administration Quarterly*, 43, 40-50.
- Cialdini, R. B., & Goldstein, N. J. (2003). Social influence: Compliance and conformity. *Annual Review of Psychology*, 55, 591-621.
- Cialdini, R. B., Reno, R. R., Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, 58(6), 1015-1026.
- Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In D. T. Gilbert, Fiske, S. T., & Lindzey, G. (Eds.), *The handbook of social psychology* (Vol. 2, pp. 151-192). Boston, MA: McGraw-Hill.
- Clayton, S., & Myers, G. (2009). *Conservation psychology: Understanding and promoting human care for nature*. Chichester, UK: John Wiley & Sons Limited.

- Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 115-159.
- Cohen, M. A., Fenn, S., & Konar, S. (1995). Environmental and financial performance: Are they related? *Investor Responsibility Research Centre*.
- Corral-Verdugo, V. (1997). Dual 'realities' of conservation behaviour: Self-reports vs observations of re-use and recycling behaviour. *Journal of Environmental Psychology*, 17, 135-145.
- Corral-Verdugo, V., & Frías-Armenta, M. (2006). Personal normative beliefs, antisocial behaviour, and residential water conservation. *Environment and Behaviour*, 38, 406-421.
- Costanzo, M., Archer, D., Aronson, E., & Pettigrew, T. (1986). Energy conservation behaviour: The difficult path from information to action. *American Psychologist*, 41(5), 521-528.
- Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgement. *Journal of Abnormal and Social Psychology*, 51, 629-636.
- DSSResearch. (2010). www.dssresearch.com. Retrieved 5 October, 2010.
- Dunlap, R. E., & Van Liere, K. D. (1978). The "new environmental paradigm": A proposed measuring instrument and preliminary results. *Journal of Environmental Education*, 9, 10-19.
- Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). Measuring endorsement of the New Ecological Paradigm: A revised NEP scale. *Journal of Social Issues*, 56, 425-442.
- EECA. (2010). www.eeca.govt.nz. Retrieved August 12, 2010

- EECA (2011). Consumer Market Research Findings. www.eeca.govt.nz. Retrieved July 24, 2011.
- Erev, I., Bornstein, G., & Galili, R. (1993). Constructive intergroup competition as a solution to the free rider problem: A field experiment. *Journal of Experimental Social Psychology*, 29, 463-478.
- Ewing, G. (2001). Altruistic, egoistic, and normative effects on curbside recycling. *Environment and Behaviour*, 33, 733-764.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7(2), 117-140.
- Fidell, L. S., & Tabachnick, B. G. (2003). Preparatory data analysis. In I. B. Weiner, Freedheim, D. K., Schinka, J. A., & Velicer, W. F. (Eds.), *Handbook of psychology: Research methods in psychology*. Hoboken, New Jersey: John Wiley & Sons, Inc.
- Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). London: Sage Publications Ltd.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behaviour: An introduction to theory and research*. MA, USA: Addison-Wesley.
- Games, P. A. (1983). Curvilinear transformation of the dependent variable. *Psychological Bulletin*, 93, 382-387.
- Games, P. A. (1984). Data transformations, power, and skew: A rebuttal to Levine and Dunlap. *Psychological Bulletin*, 95(2), 345-347.
- Gardner, G. T., & Stern, P. C. (2002). *Environmental problems and human behaviour* (2nd ed.). Boston: Pearson Custom Publishing.
- Geller, E. S. (2002a). It takes more than information to save energy. *American Psychologist*, 47, 814-815.

- Geller, E. S. (2002b). The challenge of increasing proenvironmental behaviour. In R. Bechtel, & A. Churchman (Eds.), *Handbook of environmental psychology* (pp. 525-540). New York: Wiley.
- Geller, E. S., Winett, R. A., & Everett, P. B. (1982). *Preserving the environment: New strategies for behaviour change*. New York: Pergamon Press Inc.
- Göckeritz, S., Schultz, P. W., Rendon, T., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2010). Descriptive normative beliefs and conservation behaviour: The moderating roles of personal involvement and injunctive normative beliefs. *European Journal of Social Psychology*, 40, 514-523.
- Goldstein, N. J. (2010). *The role of social norms in energy and water conservation*. Paper presented at the 27th International Congress of Applied Psychology, Melbourne, Australia.
- Goldstein, N. J., & Cialdini, R. B. (2007). The spyglass self: A model of vicarious self-perception. *Journal of Personality and Social Psychology*, 92(3), 402-417.
- Goldstein, N. J., Cialdini, R. B., Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. *Journal of Consumer Research*, 35, 472-482.
- Gordon, P. C., & Holyoak, K. J. (1983). Implicit learning and generalization of the "mere exposure" effect. *Journal of Personality and Social Psychology*, 45, 492-500.
- Griskevicius, V., Cialdini, R. B., & Goldstein, N. J. (2008). Social norms: An underestimated and underemployed level for managing climate change. *International Journal of Sustainability*, 3, 5-13.
- Guggenheim, D. (Director) (2006). *An inconvenient truth*. United States of America: Paramount Classics.

- Gussow, A. (1989). Green consumerism. *Business*, 12, 18-19.
- Hawcroft, L. J., & Milfont, T. L. (2010). The use (and abuse) of the new environmental paradigm scale over the last 30 years: A meta-analysis. *Journal of Environmental Psychology*, 30, 143-158.
- Heath, Y., & Gifford, R. (2002). Extending the theory of planned behaviour: Predicting the use of public transportation. *Journal of Applied Social Psychology*, 32(10), 2154-2189.
- Hirsh, J. B. (2010). Personality and environmental concern. *Journal of Environmental Psychology*, 30, 245-248.
- Intergovernmental Panel on Climate Change (2007). *Summary for policy makers: A report of Working Group I of the Intergovernmental Panel on Climate Change*, Retrieved August 9, 2010 from <http://www.ipcc.ch>
- Jain, A. K., Murty, M. N., & Flynn, P. J. (1999). Data clustering: A review. *ACM Computing Surveys*, 31, 264-323.
- Johnson, C., Gadon, O., Carlson, D., Southwick, S., Faith, M., & Chalfin, J. (2002). Self-reference and group membership: Evidence for a group-reference effect. *European Journal of Social Psychology*, 32(2), 261-274.
- Kaiser, F. G. (1998). A general measure of ecological behaviour. *Journal of Applied Social Psychology*, 28(5), 395-422.
- Kaiser, F. G., Byrka, K., & Hartig, T. (2010). Reviving Campbell's paradigm for attitude research. *Personality and Social Psychology Review*, 14(4), 351-367.
- Kaiser, F. G., Wölfling, S., & Fuhrer, U. (1999). Environmental attitude and ecological behaviour. *Journal of Environmental Psychology*, 19, 1-19.

- Kallgren, C. A., Reno, R. R., & Cialdini, R. B. (2000). A focus theory of normative conduct: When norms do and do not affect behaviour. *Personality and Social Psychology Bulletin*, 26(8), 1002-1012.
- Karau, S. J., & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology*, 65, 681-706.
- Karp, D. G. (1996). Values and their effect on pro-environmental behaviour. *Environment and Behaviour*, 28, 111-133.
- Kluger, J. (2006). Earth at the tipping point: Global warming heats up. *Time*, retrieved from www.time.com/magazine.
- Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behaviour? *Environmental Education Research*, 8(3), 239-260.
- Lapinski, M. K., & Rimal, R. N. (2005). An explication of social norms. *Communication Theory*, 15(2), 127-147.
- Larimer, M. E., Turner, A. P., Mallett, K. A., & Geisner, I. M. (2004). Predicting drinking behaviour and alcohol-related problems among fraternity and sorority members: Examining the role of descriptive and injunctive norms. *Psychology of Addictive Behaviors*, 18, 203-212.
- Latané, B., Williams, K., & Harkins, S. (1979). Many hands make light the work: The causes and consequences of social loafing. *Journal of Personality and Social Psychology*, 37, 822-832.
- Levine, D. W., & Dunlap, W. P. (1983). Data transformation, power, and skew: A rejoinder to Games. *Psychological Bulletin*, 93(3), 596-599.

- Mainieri, T., Barnett, E. G., Valdero, T. R., Unipan, J. B., Oskamp, S. (1997). Green buying: The influence of environmental concern on consumer behaviour. *The Journal of Social Psychology*, 137, 189-204.
- Mannetti, L., Pierro, A., & Livi, S. (2004). Recycling: Planned and self-expressive behaviour. *Journal of Environmental Psychology*, 24, 227-336.
- Mason, J. C. (1993). What image do you project? *Management Review*, 82(11), 10-11.
- McGuire, R. H. (1984). Recycling, great expectations and garbage outcomes. *American Behavioral Scientist*, 28, 71-91.
- McKenzie-Mohr, D. (2000). Promoting sustainable behaviour: An introduction to community-based social marketing. *Journal of Social Issues*, 56(3), 543-554.
- McKenzie-Mohr, D. (2002). The next revolution: Sustainability. In P. Schmuck, & Schultz, W. P. (Eds.), *Psychology of sustainable development*. Norwell, Mass., USA: Kluwer Academic Publishers.
- McKenzie-Mohr, D. (2008). Fostering sustainable behaviour: Beyond brochures. *International Journal of Sustainability Communication*, 3, 108-118.
- McMillan, M., Hoban, T. J., Clifford, W. B., & Brant, P. (1997). Social and demographic influences on environmental attitudes. *Southern Rural Sociology*, 13, 89-107.
- Menon, A., & Menon, A. (1997). Enviropreneurial marketing strategy: The emergence of corporate environmentalism as market strategy. *Journal of Marketing*, 61, 51-67.
- Midden, C., Kaiser, F., & McCalley, T. (2007). Technology's four roles in understanding individuals' conservation of natural resources. *Journal of Social Issues*, 63, 155-174.

- Midden, C. J. H., & Ritsema, B. S. M. (1983). The meaning of normative processes for energy conservation. *Journal of Economic Psychology*, 4, 37-55.
- Milfont, T. L. (2009). The effects of social desirability on self-reported environmental attitudes and ecological behaviour. *Environmentalist*, 29, 263-269.
- Milfont, T. L. (2010). Global warming, climate change and human psychology. In V. Corral-Verdugo, C. H. García-Cadena, & M. Frías-Armenta (Eds.), *Psychological approaches to sustainability: Current trends in theory, research and practice* (pp. 19-42). New York: Nova Science.
- Milfont, T. L., & Duckitt, J. (2010). The environmental attitudes inventory: A valid and reliable measure to assess the structure of environmental attitudes. *Journal of Environmental Psychology*, 30, 80-94.
- Milfont, T. L., Sibley, C. G., & Duckitt, J. (2010). Testing the moderating role of the components of norm activation on the relationship between values and environmental behaviour. *Journal of Cross-Cultural Psychology*, 41, 124-131.
- Miller, P. (2009). Saving energy: It starts at home. *National Geographic*, retrieved from: www.nationalgeographic.com.
- Monahan, J. L., Murphy, S. T., & Zajonc, R. B. (2000). Subliminal mere exposure: Specific, general, and diffuse effects. *Psychological Science*, 11, 462-466.
- Morales, A. C. (2005). Giving firms an "E" for effort: Consumer responses to high-effort firms. *Journal of Consumer Research*, 31, 806-812.
- Mummendey, A., Klink, A., & Brown, R. (2001). Nationalism and patriotism: National identification and out-group rejection. *British Journal of Social Psychology*, 40, 159-172.
- Nederhof, A. J. (1985). Methods of coping with social desirability bias: A review. *European Journal of Social Psychology*, 15, 263-280.

- Nezlek, J. B. (2008). An introduction to multilevel modelling for social and personality psychology. *Social and Personality Psychology Compass*, 2(2), 842-860.
- Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin*, 34, 913-923.
- Parker, D., Manstead, A. S. R., Stradling, S. G. (1995). Extending the theory of planned behaviour: The role of personal norm. *British Journal of Social Psychology*, 34, 127-137.
- Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes*. San Diego, CA: Academic Press, Inc.
- Reno, R. R., Cialdini, R. B., & Kallgren, C. A. (1993). The transsituational influence of social norms. *Journal of Personality and Social Psychology*, 64(1), 104-112.
- Rimal, R. N., Lapinski, M. A., Cook, R. J., & Real, K. (2005). Moving toward a theory of normative influences: How perceived benefits and similarity moderate the impact of descriptive norms on behaviours. *Journal of Health Communication*, 10, 433-450.
- Rimal, R. N., & Real, K. (2003). Understanding the influence of perceived norms on behaviours. *Communication Theory*, 13(2), 184-203.
- Rimal, R. N., & Real, K. (2005). How behaviours are influenced by perceived norms. *Communication Research*, 32(3), 389-414.
- Schmitt, N. (1996). Uses and abuses of coefficient alpha. *Psychological Assessment*, 8(4), 350-353.

- Schott, C., Reisinger, A., & Milfont, T. L. (forthcoming). Tourism and climate change: Interrelationships and implications. In *Tourism and the implications of climate change: Issues and actions*. UK: Emerald Publishers.
- Schultz, P. W. (1998). Changing behaviour with normative feedback interventions: A field experiment on curbside recycling. *Basic and Applied Social Psychology*, 21(1), 25-36.
- Schultz, P. W. (2002). Knowledge, education and household recycling: Examining the knowledge-deficit model of behaviour change. In T. Dietz, & P. Stern (Eds.), *Education, information and voluntary measures in environmental protection* (pp. 67-82). Washington, DC: National Academy Press.
- Schultz, P. W., Gouveia, V. V., Cameron, L. D., Tankha, G., Schmuck, P., & Franek, M. (2005). Values and their relationship to environmental concern and conservation behaviour. *Journal of Cross-Cultural Psychology*, 36(4), 457-475.
- Schultz, P. W., & Kaiser, F. G. (forthcoming). Promoting pro-environmental behaviour. In S. Clayton (Ed.), *Handbook of environmental and conservation psychology*. New York: Cambridge University Press.
- Schultz, P. W., Khazian, A. M., & Zaleski, A. C. (2008). Using normative social influence to promote conservation among hotel guests. *Social Influence*, 3(1), 4-23.
- Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, 18(5), 429-434.
- Schultz, P. W., Tabanico, J. J., & Rendón, T. (2008). Normative beliefs as agents of influence: Basic processes and real-world applications. In W. D. Crano, &

- Prislin, R. (Eds.), *Attitudes and attitude change* (pp. 385-409). New York: Psychology Press.
- Schultz, P. W., & Zelezny, L. C. (1998). Values and proenvironmental behaviour: A five-country survey. *Journal of Cross-Cultural Psychology*, 29, 540-558.
- Schultz, P. W., & Zelezny, L. (1999). Values as predictors of environmental attitudes: Evidence for consistency across 14 countries. *Journal of Environmental Psychology*, 19, 255-265.
- Sher, K. J., Bartholow, B. D., & Nanda, S. (2001). Short- and long-term effects of fraternity and sorority membership on heavy drinking: A social norms perspective. *Psychology of Addictive Behaviors*, 15, 42-51.
- Six Continent Hotels (2001). Our planet: The environmental update from Bass Hotels and Resorts. 3(7), 1-4.
- Stern, P. C. (1997). Toward a working definition of consumption for environmental research and policy. In P. C. Stern, T. Dietz, V. R. Ruttan, R. H. Socolow, & J. L. Sweeney (Eds.), *Environmentally significant consumption: Research directions* (pp. 12-35). Washington, DC: National Academy Press.
- Stern, P. C. (2000). Toward a coherent theory of environmentally significant behaviour. *Journal of Social Issues*, 56(3), 407-424.
- Stern, P. C., Dietz, T., & Kalof, L. (1993). Value orientations, gender, and environmental concern. *Environment and Behaviour*, 25, 322-348.
- Stern, P. C., & Gardner, G. T. (1981). Psychological research and energy policy. *American Psychologist*, 36(4), 329-342.
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin, & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33-47). Monterey, CA: Brooks/Cole.

- Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behaviour. In S. Worchel, & W. G. Austin (Eds.), *Psychology of intergroup relations*. Chicago: Nelson-Hall.
- Terry, D. J., & Hogg, M. A. (1996). Group norms and the attitude-behaviour relationship: A role for group identification. *Personality and Social Psychology Bulletin*, 22, 776-793.
- Thøgersen, J. (2009). The motivational roots of norms for environmentally responsible behaviour. *Basic and Applied Social Psychology*, 31, 348-362.
- Triandis, H. C. (1989). The self and social behaviour in differing cultural contexts. *Psychological Review*, 63, 506-520.
- Triandis, H. C. (2008). Towards the realistic perception of a culture. *Social and Personality Psychology Compass*, 2, 1812-1823.
- Tukey, J. W. (1977). *Exploratory data analysis*. Reading, Mass.: Addison-Wesley.
- Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Oxford: Blackwell.
- Vaughan, G. M., & Hogg, M. A. (2005). *Introduction to social psychology* (4th ed.). Frenchs Forest, N.S.W: Pearson Prentice Hall.
- Vining, J. (1992). Environmental emotions and decisions: A comparison of the responses and expectations of forest managers, and environmental group, and the public. *Environment and Behaviour*, 24, 3-34.
- White, K., & Dahl, D. W. (2006). To be or not be? The influence of dissociative reference groups on consumer preferences. *Journal of Consumer Psychology*, 16(4), 404-414.

- White, K. M., Smith, J. R., Terry, D. J., Greenslade, J. H., & McKimmie, B. M. (2009). Social influence in the theory of planned behaviour: The role of descriptive, injunctive, and in-group norms. *British Journal of Social Psychology, 48*, 135-158.
- Wood, M. D., Read, J. P., Palfai, T. P., & Stevenson, J. F. (2001). Social influence processes and college student drinking: The mediational role of alcohol outcome expectancies. *Journal of Studies on Alcohol, 62*, 31-43.
- Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology Monograph, 9*(2; part 2), 1-27.
- Zelezny, L., & Schultz, P. W. (2000). Promoting environmentalism. *Journal of Social Issues, 56*(3), 365-371.

CHAPTER SEVEN: APPENDICES

Appendices

Appendix I: Questionnaire (Study 1)

Social Psychology Survey 2010

PART 1. General questions about the environment

Listed below are statements about the **relationship between humans and the environment**. Please indicate the extent to which you *agree* or *disagree* with each of the statements.

1 Strongly disagree	2 Disagree	3 Unsure	4 Agree	5 Strongly agree
We are approaching the limit of the number of people the earth can support.				1 2 3 4 5
When humans interfere with nature it often produces disastrous consequences.				1 2 3 4 5
Humans are severely abusing the environment.				1 2 3 4 5
The so-called “ecological crisis” facing humankind has been greatly exaggerated.				1 2 3 4 5
Despite our special abilities humans are still subject to the laws of nature.				1 2 3 4 5
The earth is like a spaceship with very limited room and resources.				1 2 3 4 5
The balance of nature is very delicate and easily upset.				1 2 3 4 5

PART 2. Information about household energy use

Please carefully read the following information:

Household energy use is one of the largest contributors to New Zealand’s overall energy use. Each year, New Zealand homes account for 12% of the country’s total energy use. In 2008, \$2.5 billion was spent by households on electricity alone. Choosing to manage the way you use energy means you can have lower power bills, a warmer, healthier home, and less of an impact on the environment.

Considering the information you have just read, please answer the questions in Part 3.

PART 3. Behavioural questions

Considering the information you just read about household energy use, please indicate the extent to which you would be willing to engage in the following behaviours at home:

0 Not at all willing	1 A little willing	2 Moderately willing	3 Very willing	4 Extremely willing	
Switch appliances off at the wall when not in use.	0	1	2	3	4
Turn lights off when not using them.	0	1	2	3	4
Choose to buy energy efficient appliances.	0	1	2	3	4
Reduce the length of showers.	0	1	2	3	4
Replace light bulbs with energy efficient bulbs.	0	1	2	3	4
Keep computers on standby settings when not in use.	0	1	2	3	4
Wash clothes in cold water rather than hot water whenever possible.	0	1	2	3	4
Use the ‘eco’ cycle option in dishwashers.	0	1	2	3	4
Close curtains to keep heat in.	0	1	2	3	4
Check the seals on the fridge.	0	1	2	3	4
Wash full loads of laundry rather than several smaller loads.	0	1	2	3	4
Only use a heated towel rail when needed.	0	1	2	3	4
Regularly defrost the freezer.	0	1	2	3	4
Use a thermostat and timer on heaters.	0	1	2	3	4

PART 4. General questions about the environment

Listed below are some more statements about the **relationship between humans and the environment**. Please indicate the extent to which you *agree* or *disagree* with each of the statements.

statements:

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly agree
Humans have the right to modify the natural environment to suit their needs.				1 2 3 4 5
Plants and animals have as much right as humans to exist.				1 2 3 4 5
The earth has plenty of natural resources if we just learn how to develop them.				1 2 3 4 5
The balance of nature is strong enough to cope with the impacts of modern industrial nations.				1 2 3 4 5
Human ingenuity will ensure that we do not make the earth unlivable.				1 2 3 4 5
Humans were meant to rule over the rest of nature.				1 2 3 4 5
Humans will eventually learn enough about how nature works to be able to control it.				1 2 3 4 5
If things continue on their present course, we will soon experience a major ecological catastrophe.				1 2 3 4 5

PART 5. Specific questions

How would you rate the positive impact of energy efficient behaviours on the environment?						
1	2	3	4	5	6	7
No positive impact						Very high positive
impact						

How would you rate New Zealanders' overall engagement in energy efficient behaviours?						
1	2	3	4	5	6	7
Low engagement						Very high engagement
engagement						

How would you rate Wellingtonians' overall engagement in energy efficient behaviours?						
1	2	3	4	5	6	7
Low engagement						Very high engagement
engagement						

PART 6. Background questions

(Please remember that your responses are confidential)

1. How old are you? _____ years.	2. What is your gender? 1. Female 2. Male	3. Are you a member of any environmental organisation (e.g., Greenpeace)? 1. Yes 2. No
4. Were you born in NZ? 1. Yes 2. No	5a. Have you seen EECA's campaigns about energy efficiency? 1. Yes 2. No.	
	5b. If yes, in which media? 1. Television 3. Brochures / Pamphlets 2. Radio 4. Internet 5. Other (please specify):	
6. Which ethnic group do you belong to? Please indicate the group you most strongly identify with. 1. New Zealand European (Pākehā) 4. Māori 2. Pacific Nations 5. Asian 3. Indian 6. Other (please specify):		

Appendix II: Information sheet (Study 1)



Investigators:

Ben Tilyard

Masters Student
School of Psychology
Victoria University of Wellington
Ben.Tilyard@vuw.ac.nz

Dr. Taciano L. Milfont

Lecturer
School of Psychology
Victoria University of Wellington
Taciano.Milfont@vuw.ac.nz

Purpose of this research:

- This research consists of a questionnaire that asks about opinions, attitudes, and behaviours on a number of social issues that are relevant to our future. The goal is to understand the opinions towards these issues.

Who is conducting the research?

- I am a Masters student in the School of Psychology. This research has been approved by the University ethics committee.

What is involved if you agree to participate?

- If you agree to participate in this study you will be asked to complete a paper survey. The survey asks you about your environmental values, specific behaviours, and some demographic questions. The whole study will not take more than **5** minutes for you to complete.
- During the research you are free to withdraw, without any penalty, at any point before your data have been collected.

Privacy and Confidentiality

- I will keep your data for at least five years after publication.
- You will never be identified in my research project or in any other presentation or publication. The information you provide will be coded by number only.
- In accordance with the requirements of some scientific journals and organisations, your coded data may be shared with other competent researchers.
- Your coded data may be used in other, related studies.
- A copy of the coded data will remain in my custody.

What happens to the information that you provide?

- The data you provide may be used for one or more of the following purposes: The overall findings may be submitted for publication in a scientific journal, or presented at scientific conferences; the overall findings may form part of a PhD, Masters or Honours thesis that will be submitted for assessment.

Consent for Participation:

Please note that by completing and returning the questionnaires you agree that the data will be used and analysed.

If you have any further questions regarding this study, please feel free to contact either of the investigators listed above.

Appendix III: Debriefing sheet (Study 1)



How greatly do you rate the influence of others on your own behaviour? Previous research has shown that individuals give little emphasis to the knowledge of how others behave, often dismissing such information as having little influence on their own behaviour. However, our behaviour is highly influenced by what other people do and by what we perceive as being approved of by other people.

The current research assesses individuals' self-reported pro-environmental behaviour after being informed of the common behaviours of other individuals. Previous research within several environmental settings has used similar information to encourage specific pro-environmental behaviours. When participants are informed that similar others actively engage in a specific behaviour, and believe it is socially desirable to do so, their own tendency to engage in the behaviour increases.

The implications of such research can be beneficial in a range of areas. Pro-environmental organisations can draw on research evidence to employ similar campaigns to promote environmental conservation, organisations can develop new ways to encourage members to save resources (and money), and policy developers can draw on a growing body of literature to elicit desired behaviour change.

Thank you for participating in this research. This research project is being conducted by Ben Tilyard and Dr. Taciano L. Milfont from the School of Psychology. If you have any questions regarding your involvement in this research, or issues regarding the research in general, please do not hesitate to contact me via e-mail at Ben.Tilyard@vuw.ac.nz.

Appendix IV: Research participation request (Study 2)

VICTORIA UNIVERSITY OF WELLINGTON
Te Whare Wananga o te Upoko o te Ika a Maui



I am a Masters student at the School of Psychology at Victoria University of Wellington investigating how businesses can save money through the use of social norm messages.

Two recent studies (Goldstein, Cialdini, & Griskevicius, 2008; Schultz, Khazian, & Zaleski, 2008) have used social norm messages in hotel settings to promote pro-environmental behaviour among hotel guests (through specifically increasing towel reuse rates). Such an increase in towel reuse can be achieved by simple changes in the hotel's standard environmental plea: by making guests aware that others engage in conservation behaviours and approve of them, these guests tend to increase their towel reuse. Although such behavioural change may seem small at an individual level, this change is dramatically increased at an organisational level.

I would like to conduct a similar study using social norm messages to increase towel reuse rates in your hotel. Unlike previous research, the current research will place greater emphasis on the organisational benefits of such intervention by underlining the resource and financial benefits that stand to be made.

While such research will add to an existing body of literature on normative influence and pro-environmental behaviours, the participating organisation also serves to benefit in many ways. Organisations that encourage environmental programmes are seen more favourably by consumers and the wider public (a message that is particularly paramount given New Zealand's clean and green image) while also standing to significantly decrease their water, chemical, and labour costs - leading to significant financial gains.

The implementation of such research in your organisation will have worthwhile financial and moral benefits while also providing me with the opportunity to expand on the existing literature in this important growing field of scientific research. I would appreciate the opportunity to meet with you to discuss this research further in the hope that you may consider being involved.

I look forward to hearing from you.

Ben Tilyard
 Postgraduate Student
 School of Psychology
 Victoria University of Wellington
Ben.Tilyard@vuw.ac.nz

Appendix V: Towel reuse message – side A**Appendix VI:** Towel reuse message – environmental condition

Appendix VII: Towel reuse message – combined descriptive and injunctive normative condition



Appendix VIII: Towel reuse message – combined descriptive and injunctive normative condition paired with reference group information



Appendix IX: Data collection template (8th floor only)

Date _____ **Please put reuse message near sink with writing face-up**

Room number	Number of towels replaced	Number of towels reused (hanging on rack)	Number of occupants	Check out today (yes/no)	New guest check in today (yes/no)	Staff initials
801						
802						
803						
804						
805						
806						
807						
808						
809						
810						
811						
812						
813						
814						
815						
816						
817						
818						
819						