An Inconvenient Reality: The Relationship between Personality, Advertising, Pro-Environmental Attitudes, and Pro-Environmental Behaviour

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Abstract

Despite the severity of earth's ecological crisis and the important role psychology plays in preventing further damage, little research has been conducted into the psychology of environmental conservation. Furthermore, the few studies that have been conducted pay little attention to personality, which has been shown to have a significant relationship with environmental conservation. The aim of this thesis was to conduct research into this field, in particular how personality is related to pro-environmental attitudes and behaviour. The aim of the Study 1 was to examine which personality traits are related to pro-environmental attitudes and behaviour. It was found that the personality traits of locus of control, altruism, and Openness were positively related to pro-environmental attitudes. Agreeableness and psychopathy were negatively related to pro-environmental behaviour. Furthermore, pro-environmental attitudes were positively related to pro-environmental behaviour. Study 2 aimed to examine the effects of advertising on pro-environmental attitudes and behaviour. It was found that positive imagery increased pro-environmental attitudes, and that Openness was positively related to pro-environmental attitudes. In contrast imagery did not affect pro-environmental behaviour, but Neuroticism was negatively related to pro-environmental behaviour. The strengths and limitations of these studies were discussed, as well as how their findings contributed to the field of conservation psychology.

Declaration of Originality

The work found within this thesis has not been submitted for a higher degree to any other university or institution. All intellectual property and work conducted by persons other than the author have been cited appropriately throughout this thesis. All empirical research contained within was approved by the Human Research Ethics Committee at Macquarie University (reference number: HREC 5201500040).

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1.1 Ecological Crisis

As we enter the 21st century, environmental deterioration is one of the most troubling problems for humanity (Saunders, 2003). Since the beginning of the past century the human population has more than quadrupled in size (McNeill, 2000). Water and energy usage has increased 6-9 and 16 times respectively (McNeill, 2000; World Water Council, 2015). Carbon dioxide emissions have increased a dramatic 17 times, expanding levels of toxins in various environments (Rees, 2008). According to the global Living Planet Index, there has been an overall decline of 52% in vertebrates between 1970 and 2010 (WWF, 2014). In fact, many scientists argue that we are entering a sixth mass extinction, in part due to human caused climate change, with as many as 15-37% of species to be extinct by 2050 (Baronsky et al., 2011; Ceballos et al., 2015; Wake & Vredenburg, 2008). Consequently, there appears to be a clear and dire ecological crisis, and one that needs to be dealt with quickly.

In the face of such a daunting ecological crisis, the international community has made a call to action time and time again (United Nations, 2012). As a result attention towards these problems has increased dramatically, especially in regards to biodiversity (Chape, Harrison, Spalding, & Lysenko, 2005). Biodiversity is defined as all hereditary-based variation across all levels of organisation, ranging from the genes of a single species, to the species composing a broader community, to the largest level of all communities as a global ecosystem (Wilson, 1997). Biodiversity is lost with each successive generation at an alarming rate (Kahn 1999; Miller 2005). In the face of this global threat to biodiversity, much attention has been raised towards the conservation of biodiversity, with 193 nations signing the UN's convention on biodiversity (St. John, Edwards-Jones, & Jones, 2010). Despite this increased attention and continued warnings, the message of change has gone mostly unheeded by the international community (Matsuba & Pratt, 2013) and there has been little improvement in the health of our

planet (Scientific American, 2010). Furthermore, there are still issues of, habitat loss (Brooks et al., 2002), species extinction (Schipper et al., 2008), funding for maintaining biodiversity (James, Gaston, & Balmford, 1999), and climate change (Parmesan, 2006).

Since biodiversity is lost with each successive generation at an alarming rate, each generation has fewer experiences of nature (Kahn 1999; Miller 2005). This combined with increasingly urbanised populations, leads to what has been described as an environmental generational amnesia, in which each new generation views the degraded version of the environment as the normal experience (Kahn, 1997). This is a problem not only because of this shifting of norms, but also because researchers have found that early experiences with nature are cited as the most common inspiration for later pro-environmental attitudes and behaviours by environmental conservationists (Matsuba & Pratt, 2013). Thus, with potentially fewer chances to experience nature, pro-environmental attitudes and behaviour might weaken, resulting in more environmental degradation and subsequently a downward spiral.

So far environmental conservation work has been dominated by the field of biological sciences (Adams 2007; Saunders, 2003). However, it is becoming increasingly evident that in order to face these challenges we need to understand the one species that is not only the primary cause of this ecological crisis, but also the only species capable of dramatically affecting the entire ecosystem, humans (Saunders, Brook, & Myers, 2006). Due to the importance of understanding humans' role in environmental conservation, the aim of this study was to examine how individual differences are related to environmental conservation, both in one's attitudes and behaviour. Lastly, this study aimed to examine how advertising influences these attitudes and behaviour. In particular how the imagery used in advertising affects pro-environmental attitudes and behaviours, in regards to the use of positive and negative visual images.

1.2 Conservation and Environmental Psychology

It is vitally important that human attitudes and behaviour towards nature is better understood to combat earth's ecological crisis (Kansky & Knight, 2014; Markowitz, Goldberg, Ashton, & Lee, 2012). Although psychology has been interested in attitudes *ad nauseam*, and that there has been considerable research into environmental attitudes, research on environmental attitudes is still limited (Milfont, 2007; Saunders, 2003). Despite this, there has been some work in this area and over the past few decades some studies have attempted to describe and understand pro-environmental individuals (Markowitz, Goldberg, Ashton, & Lee, 2012). Such studies are being organised under the banner of conservation psychology (Saunders, 2003). Conservation psychology is a relatively new field, and has the dual aim of attempting to understand why people act pro- or anti-environmentally, as well as identifying ways to promote pro-environmental behaviours and decrease anti-environmental ones (Clayton & Brook, 2005). It is an applied field that incorporates theories, principles, and methods from various psychological fields to help solve problems of environmental conservation.

There is some confusion in the literature about the differences between conservation psychology and environmental psychology (Clayton & Brook, 2005). Environmental psychology emphasises the importance of needing to understand behaviour in context, and the reciprocal relationship between people and their environments (Clayton, 2012). It thus examines the interactions between humans and the environment, regardless of whether this is human-made or natural (Clayton & Brook, 2005; Saunders, 2002). In contrast, conservation psychology solely looks at environmental conservation attitudes and behaviours (Clayton & Brook, 2005). It draws upon various sub-disciplines of psychology towards understanding and promoting environmentally sustainable relationships with nature (Clayton, 2012). Despite this difference, environmental psychology has contributed greatly to our understanding of why conservation psychology is important. For example, this field of research has shown that

environmental teratogens impact negatively on cognitive and social prenatal development, and also impair cognitive functioning and increase stress levels later in life (Clayton & Brook, 2005), and that global warming has been suggested to increase intergroup conflict (Doherty & Clayton, 2011). Furthermore, interaction with the environment, which is dwindling due to environmental problems like global warming, improves emotional and physical well-being (Frumkin, 2001). Thus, it is clear that without conservation psychology we are facing a number of physical and psychological problems as a result of earth's ecological crisis (Clayton & Brook, 2005). In fact, research is only now finding out the psychological issues associated with the decrease in biodiversity (Saunders et al. 2006). Although conservation psychology is greatly shaped by environmental psychology, other fields such as developmental and social psychology have also shaped it.

1.2.1 Contributions to Conservation Psychology

Developmental research has shown that attitudes that are formed early in life tend to be persistent through the later years of life (Bjerke, Ødegårdstuen, & Kaltenborn, 1998). Research examining environmental activists supports this, with these individuals often recalling environmental experiences in their youth (Horwitz, 1996). Furthermore, these individuals claimed these experiences founded their pro-environmental beliefs. A positive correlation has also been found between childhood participation in nature and later adult pro-environmental attitudes and behaviours (Wells & Lekies, 2006). In fact, positive experiences of the environment are reported more by activists than non-activists (Bisson, Alisat, Norris, & Pratt, 2012). Negative experiences also play a significant role (Matsuba & Pratt, 2013), with negative experiences of nature (e.g., deforestation) developing pro-environmental attitudes for not only activists but also non-activists (Bisson et al., 2012). These studies point out the importance of early childhood experiences in shaping pro-environmental attitudes. This contact with nature, especially early experiences, can nurture an emotional bond with the

environment (Zhang, Goodale, & Chen, 2014), which seems to be a critical driver of pro-environmental attitudes (Cheng & Monroe, 2012; Collado & Corraliza, 2015).

While the findings above are based on retrospective reports (and thus potentially less reliable), socio-cognitive therapists nevertheless argue that early experience in nature are foundational for later pro-environmental attitudes and behaviours as they facilitate early cognitive schemes and scripts (Matsuba & Pratt, 2013). One non-retrospective study found that increased contact with nature increased children's affiliation for nature, and reduced their fear and aversion to nature (Zhang et al., 2014). This body of research has demonstrated the importance of early experiences of nature in influencing pro-environmental attitudes and behaviours.

Another major field that has contributed towards conservation psychology's knowledge of pro-environmental attitudes and behaviours is that of social psychology. Social psychologists generally attribute decision making to be influenced by the characteristics of the decision maker and the pressure they perceive to behave in a certain way (i.e., social norms; St. John et al., 2010). Attitudes can be defined as a tendency to respond with a degree of favour or disfavour to a psychological object, which is any aspect of an individual's world, including objects, people, issues, or behaviours (Fishbein & Ajzen, 2010), whereas, behaviours are observable actions or inactions. There are three main explanatory models for the link between attitudes and behaviour: the theory of planned behaviour (TPB), value-belief-norm (VBN), and resource-based explanations (Marquart-Pyatt, 2012). According to TPB, beliefs, attitudes, and intentions directly influence behaviours. Alternatively, VBN theory has a causal sequencing of values, beliefs, and personal norms (norms that an individual not only agrees with but follows; Wiidegren, 1998) as key factors in behaviours. Lastly, resource-based explanations highlight the role of resources, like education and income, in influencing behaviours (Marquart-Pyatt, 2012). Conservation psychologists aim to use these models to better understand the underlying predictors of behaviour, and thus make it

possible to create interventions aimed at targeting and changing anti-environmental behaviours (Parker, 2002). However, a number of other variables are implicated in attitudes and behaviour.

A meta-analysis of 128 studies (Hines, Hungerford, & Tomera, 1986/1987), a follow up meta-analysis of 46 studies (Bamberg & Möser, 2007), and a subsequent theoretical synthesis (Kollmuss & Agyeman, 2002) found that a number of variables are consistently related with pro-environmental behaviour. These include verbal commitment, locus of control, attitude, personal responsibility, social norms, moral norms, and knowledge (Bamberg & Möser, 2007; Barney, Mintzes, & Yen, 2005). Of these, environmental knowledge is one of the stronger factors related to pro-environmental behaviour (Barney et al., 2005). However, knowledge appears only slightly related to pro-environmental *attitudes* (Tarrant, Bright, & Cordell, 1997). On the other hand, years of education has been found to influence pro-environmental attitudes but not necessarily pro-environmental behaviour (Kollmuss & Agyeman, 2002). Horwitz (1996) found that environmental conservationists listed formal education as being influential in shaping their pro-environmental attitudes, but that it merely formalized and developed their attitudes rather than founded them.

Gender and age have been shown to be related to the type of pro-environmental attitudes individuals have (Kellert, 1984; Kellert & Berry, 1987). Age has been shown to have a mixed relationship with pro-environmental attitudes, with some finding a positive relationship between the two (Kellert, 1984) and others a negative relationship (Dunlap, Van Liere, Mertig, & Jones, 2000). One possibility for this is that these studies use different measures of pro-environmental attitude. Gender has been found to be more consistent, with females having stronger pro-environmental attitudes and pro-environmental behaviour than men (Zelezny, Chua, & Aldrich, 2000). Gender has further been shown to have an interesting mediating effect with knowledge, in that females have weaker environmental knowledge but are more emotionally engaged with the environment, whereas males have greater

environmental knowledge but are less emotionally engaged (Kollmuss & Agyeman, 2002). However, a recent study demonstrated that unlike general environmental knowledge, females are more knowledgeable on climate change than males (McCright, 2010).

There are other demographic factors that are related to pro-environmental attitudes and behaviours. Firstly, social desirability has been claimed to affect environmental attitudes and behaviour (Milfont, 2009). However, recent research has suggested that there is only a weak direct effect of social desirability on pro-environmental attitudes, and none on pro-environmental behaviour (Milfont, 2009). Another demographic factor, location, has been shown to be related to pro-environmental attitudes, with individual living in urban areas having higher pro-environmental attitudes than those who live in rural areas (Berenguer, Corraliza, & Martin, 2005). Furthermore, some animals, in particular large ones, such as tigers and elephants, are capable of destroying property and injuring humans (Liu et al., 2011). These destructive actions influence individuals to hold negative attitudes towards these particular species (Liu et al., 2011). However, attitudes towards these animals is sometimes complex, such as with elephants, who are favoured very positively by other populations, and at times used as charismatic megafauna for environmental campaigns (Woods, 2000). Despite the sometimes complex nature it is clear that a number of demographic variables and fields have contributed to our understanding of pro-environmental attitudes and behaviours. However, there is one field that has had little attention in conservation psychology, personality.

1.3 Personality and Conservation Psychology

One limitation with past research on conservation psychology is that is has mostly ignored personality traits, despite the limited studies in the area suggesting a link between personality and environmental conservation (Markowitz et al., 2012; Milfont & Sibley, 2012). Personality is the individual differences in characteristic patterns of thinking, feeling, and behaving (American Psychological Association, 2015) and has been consistently linked to

what motivates one's beliefs, attitudes, and values (Milfont & Sibley, 2012). As individuals are only able to make measurable impacts on the environment by performing different behaviours across various situations, one's characteristic patterns of behaviour might be more important than situational factors in understanding these various behaviours (Markowitz et al., 2012).

One personality variable that has received attention is one's locus of control (LOC), which represents an individual's perception of whether they can affect change as a result of their own behaviours (Newhouse, 1991). An internal LOC means an individual believes that their actions can bring change, while those with an external LOC believe that change is out of their control (i.e., their actions cannot bring change; Kollmuss & Agyeman, 2002). As a result it is believed that those with an external LOC are unlikely to act ecologically (Kollmuss & Agyeman, 2002). A study of attitudes towards protecting sea turtles, found that an increased concern for their protection was related to a more internal LOC (Dimopoulos & Pantis, 2003). However, there has been little research into personality outside of LOC.

The little personality research that has been conducted in environmental conservation has looked at narrow personality traits (e.g., social dominance orientation; Milfont, Richter, Sibley, Wilson, & Fischer, 2013), instead of broader ones (e.g., the Big Five; Markowitz et al., 2012). However, some research has demonstrated a relationship between pro-environmental behaviour and the Big Five (Hirsh & Dolderman, 2007; Markowitz et al., 2012; Milfont & Sibley, 2012; Nisbet, Zelenski, & Murphy, 2009; Soliño & Farizo, 2014). The Big Five consists, of Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Openness to experience is measure of one's level of imagination, creativity, and openness to ideas. Conscientiousness reflects an individual's tendency to show self-discipline and control and includes traits such as responsibility and orderliness. Extraversion measures one's outgoing, talkative, energetic, and social interaction. Agreeableness on the other hand measures traits related to compassion, empathy, and concern

for others. Lastly, Neuroticism reflects an individual's proneness to being anxious, irritable, and emotionally unstable (Hirsh & Dolderman, 2007).

Research examining the Big Five together is inconsistent, with some research showing no relationship between the Big Five and environmentalism (Hirsh, 2010; Hirsh & Dolderman, 2007), while others show a small but significant one (Milfont & Sibley, 2012). Openness has been consistently shown to be positively related to environmental conservation (Hirsh & Dolderman, 2007; Nisbet et al., 2009; Soliño & Farizo, 2014). Conscientiousness has been found to be positively related to environmental values and electrical consumption in a college sample (Milfont & Sibley, 2012). Agreeableness tends to be positively related to environmental conservation (Hirsh & Dolderman, 2007; Nisbet et al., 2009). However, research has also found a negative relationship between Agreeableness and pro-environmental behaviour (Soliño & Farizo, 2014). Despite this, the majority of research suggests a positive relationship between the two. However, it appears that this difference in findings depends on how pro-environmental behaviour is measured, with studies that include realistic alternatives to helping the environment (e.g., helping people) finding a negative relationship between Agreeableness and pro-environmental behaviour. Neuroticism's relationship is inconsistent, with research showing positive and negative relations to environmental engagement (Milfont & Sibley, 2012). These differences in findings might be that in some instances higher Neuroticism might make individuals worry more about the environment, and subsequently act more environmentally, whereas in other situations too much anxiety towards a problem might cause inaction. Lastly, Extraversion has been found to be positively linked with choosing pro-environmental programs (Soliño & Farizo, 2014). Overall, research suggests that Agreeableness and Openness are the most consistently related factors to environmental conservation (Hirsh, 2014).

There have been some attempts to explain the relationship between the Big Five and environmental conservation through various mechanisms. Attempts to explain these apparent

connections propose that Openness and Agreeableness are related to environmental engagement due to their relationship with empathy and altruism, which is believed to be related to pro-environmental behaviour (Markowitz et al., 2012; Milfont & Sibley, 2012). In regards to Conscientiousness certain aspects (e.g., repetition of behaviour) might work in favour of pro-environmental behaviours, while others (e.g., traditionalism) would work against them (Markowitz et al., 2012).

Models which include altruism, empathy, and prosocial behaviour provide another framework in understanding pro-environmental behaviour (Kollmuss & Agyeman, 2002). Many findings on environmental conservation have been interpreted as supporting an empathy-altruism model of pro-environmental behaviours (Cialdini, 2003; Schultz, 2001). For example, Allen and Ferrand (1990) found that personal control and sympathy were related to pro-environmental behaviour, providing partial support for Geller's hypothesis that in order to act environmentally one needs to move focus beyond one's self (Kollmuss & Agyeman, 2002). Similarly, individuals who are selfish and highly competitive are less likely to act environmentally (Borden & Francis, 1978; Hirsh & Peterson, 2009). Furthermore, traits that reflect self-interested tendencies and limited investment in social relations, have been shown to be linked to a lack of environmental concern (Milfont & Sibley, 2012). The reverse has also been shown in that individuals who are more prosocial show greater environmental consciousness (Cameron, Brown, & Chapman, 1998; Schultz, 2001) and that those who are selfless and sympathetic are more environmentally engaged (Milfont & Sibley, 2012). Therefore, it is clear that altruism, empathy, and prosocial behaviour are positively related to environmental conservation. The findings linking empathy, altruism and prosocial behaviour with environmental concern has also been used to explain the relationship between the Big Five and environmental constructs. For instance, Openness and Agreeableness' relationship with environmental conservation is argued to be because of their relation to empathy, altruism and prosocial behaviour (Markowitz et al., 2012; Milfont & Sibley, 2012). However, to this

researcher's knowledge none of these studies examining the Big Five have controlled for empathy and altruism.

As mentioned previously, individuals who have a lack of empathy, are selfish, and exploitive might be less likely to act pro-environmentally. Research has consistently shown that the Dark Triad traits of psychopathy, narcissism, and Machiavellianism are bounded by these traits (Jonason, Li, & Teicher, 2010; Paulhus & Williams, 2002). Yet there appears to be no research into how individuals who score highly on measures of the Dark Triad are related to pro-environmental attitudes or behaviour.

1.4 Attitudes and Behaviour

So far this thesis has talked about attitudes and behaviours almost interchangeably. However, they are distinctly different factors. Attitudes can be defined as a tendency to respond with a degree of favour or disfavour to a psychological object, which is any aspect of an individual's world, including objects, people, issues, or behaviours (Fishbein & Ajzen, 2010), whereas, behaviours are observable actions or inactions. Within conservation research there is a general perception that pro-environmental attitudes are likely to be linked to pro-environmental behaviours (St. John et al., 2010). However, attitudes or knowledge alone reveal a very limited picture of the predictors of pro-environmental behaviour (St. John et al., 2010) and research shows a discrepancy between pro-environmental attitudes and behaviour (Kollmuss & Agyeman, 2002). St. John et al. (2010) argue that this disconnection is mainly due to researchers collecting information on pro-environmental attitudes that are different to the pro-environmental behaviour examined (e.g., attitudes towards animals and then measuring recycling).

Despite this disconnection, research shows a consistent but small impact of pro-environmental attitudes on pro-environmental behaviours (Kollmuss & Agyeman, 2002). In conservation psychology there are two main measures of pro-environmental attitudes. These

are the New Environmental Paradigm (NEP) and Kellert's typologies (Rauwald & Moore, 2002).

1.4.1 Measures of Pro-Environmental Attitudes

Within conservation psychology there are two major measures of pro-environmental attitudes, the NEP and Kellert's typologies (Rauwald & Moore, 2002). The NEP has been extensively validated as a tool for studying pro-environmental attitudes (Hawcroft & Milfont, 2010). This revised version improves upon the old version by tapping into a wider range of pro-environmental attitudes and updates the terminology used (Dunlap et al., 2000). The NEP was designed to measure general environmental concern (Stern, Dietz, & Guagnano, 1995) by measuring the concern individuals feel towards environmental issues (Dunlap et al., 2000). A strength of this scale is that that it examines global environmental issues rather than community specific ones (Dunlap et al., 2000). This enables this scale to better capture attitudes towards the global ecological crisis, which allows this scale to be applied more broadly. The NEP does have its limitations; firstly, it is a more cognitive measure and ignores the emotional side of conservation attitudes (Hirsh & Dolderman, 2007). Although a strength, the general nature of this measure is an issue when examining attitudes towards a community specific issue (e.g., damage by elephants to communities; Rauwald & Moore, 2002).

Kellert's typologies were developed to reflect the relationship between humans and nature, in particular animals (Rauwald & Moore, 2002). Unlike the NEP, Kellert's scale is often adapted to suit a specific culture (Rauwald & Moore, 2002). Kellert's typologies vary but often include Naturalistic, Ecologistic, Humanistic, Moralistic, Scientistic, Aesthetic, Utilitarian, Dominionistic, and Negativistic attitudes towards nature (Kellert, 1984). A brief description of these can be seen in Table 1. A strength of these typologies is that they allow attitudes towards specific environmental issues (e.g., wolves) to be assessed, rather than getting a more general pro-environmental attitude (Rauwald & Moore, 2002). However, this

is also a limitation as it does not necessarily look at global environmental issues like global warming, or biodiversity loss (Rauwald & Moore, 2002).

Table 1

Kellert's typologies

Naturalistic	Primary interest and affection for nature
Ecologistic	Primary concern of the environment as a system, and its interrelationships between species and environments
Humanistic	Primary interest and affection for specific animals, in particular pets
Moralistic	Primary concern is proper treatment of animals, opposing exploitation and cruelty
Scientistic	Primary interest is in physical and biological attributes of animals
Aesthetic	Primary interest is aesthetic qualities of animals
Utilitarian	Primary concern is for the usefulness and value of animal and environment
Dominionistic	Primary interest is in mastery and control of animals
Negativistic	An active avoidance of animals

Based on Kellert (1984).

It is clear that these scales have their strengths and limitations in examining pro-environmental attitudes. It has been demonstrated that combining these scales provides a stronger predictor for supporting environmental protection policies by the community (Rauwald & Moore, 2002). This is possibly because while the NEP is general and provides better knowledge on general attitudes towards the environment, Kellert's scales are often adapted to local issues and thus better at picking up cultural differences (Rauwald & Moore, 2002). Thus, as mentioned previously, these scales strengths counter the limitations of the other. It is for this reason that both these measures were used in this thesis.

So far this thesis has focused on the first aim of conservation psychology, which is to examine what factors are related to pro-environmental attitudes and behaviour. It has shown the relationship of certain factors to these attitudes and behaviours, and the importance of studying other factors, mainly personality. Although this thesis will examine these personality

factors, thus contributing to the first aim of conservation psychology, it will also examine the second aim of conservation psychology, which is to examine how behaviours and attitudes can be changed to be more pro-environmental.

1.5 Advertising

As mentioned previously conservation psychology is concerned with not only understanding why people act environmentally, but also ways to promote environmentally friendly behaviours (Clayton & Brook, 2005). One way individuals can be targeted to change their behaviours is through the use of advertising and other campaigns that promote pro-environmental behaviours or reduce anti-environmental behaviours. However, there appears to be a dearth of research into this particular area within conservation psychology. Nevertheless, work done in health psychology (e.g., fear appeals in health campaigns) is relevant because environmental campaigns similarly focus on fear appeals to encourage people to donate or change their behaviour. A fear appeal is a message or other form of communication that is designed to influence or persuade an individual to perform or not perform a certain action through the use of fear (Maddux & Rogers, 1983).

A considerable amount of research has shown that fear appeals successfully motivate behaviour change across various behaviours (Witte & Allen, 2000). Despite this, there is some controversy over the effectiveness of fear appeal campaigns (Block & Keller, 1995). Even today fear appeals remain a paradox in health promotion, in that the most effective model for behaviour change (fear appeals) can also be the least effective (Peters, Ruiter, & Kok, 2014). For example, Earl and Albarracín (2007) found that the use of fear appeals was ineffective in HIV cases, and actually led to decreases in condom use. On the other hand, fear appeals are used widely in health campaigns (Cohen, Shumate, & Gold, 2007) and many effective cases can be seen. For instance, fear appeals towards smoking are more effective than non-fear appeal messages (Biener, 2002). Despite these contradictory findings, a meta-

analysis found a weak but reliable influence of fear appeals on changing attitudes, behaviours, and intentions (Witte & Allen, 2000)

Over half a century of research has found three key variables of fear appeals: fear, perceived threat, and perceived efficacy (Witte & Allen, 2000). Fear appeals are either positively or negatively framed, which are different ways of presenting similar information (Maheswaran & Meyers-Levy, 1990). For example, a positively framed message would be "quitting smoking reduces risk of lung-cancer", while a negatively framed message would be "not quitting smoking increases your chances of lung-cancer" (Block & Keller, 1995). Maheswaran and Meyers-Levy (1990) found that positive frames are more effective than negative frames when the recipient was less motivated to process the message, and that negative frames are more effective than positive frames when the recipient was more motivated to process the message. Another factor that influences message effectiveness is the efficacy of the message, in that when the message is perceived to be less effective, negative frames are more effective than positive frames (Meyerowitz & Chaiken, 1987). Block and Keller (1995) suggest that this occurs because when perceived efficacy is lower, greater message processing occurs, which leads to negative frames being more effective, which was supported in their study. Furthermore, Block and Keller showed that when efficacy was higher, less in-depth processing was required for the message and thus positive frames were more effective. Therefore, the effect of a message's framing depends on depth of processing and the efficacy of the message.

This research into health campaigns has found that efficacy and depth of processing are intertwined and are important variables for fear appeals. However, one must keep in mind that this research has been focussed on health behaviours that directly impact the individual; this is in contrast to environmental campaigns which aim to create more sustainable behaviour that does not directly impact an individual's health, but indirectly through the environment.

Despite this, these results can be related to conservation messages, as many of these variables also impact and are involved in environmental campaigns (Saunders et al., 2006).

Although there is little research on advertising campaigns in a conservation setting, a study by Grankvist, Dahlstrand, and Biel (2004) did examine advertising in an environmental setting. They hypothesised that individuals who had a strong environmental concern would have a promotion focus (a focus on gains) in regards to pro-environmental behaviour, whereas individuals with a weak environmental concern would have a prevention focus (a focus on non-losses). Grankvist et al.'s study examined whether a green label (indicating environmentally friendly) compared to an orange label (environmentally average) was more effective than showing red labels (bad for the environment) compared to the orange label. It was shown that those with high environmental concern were more influenced by the positive comparison (i.e. green vs orange) to act environmentally, whereas those who had a weaker environmental concern were more motivated by the negative comparison (i.e., red vs orange). This study showed that those who hold pro-environmental attitudes were more likely to choose the more environmental option when given a positive comparison than when shown a negative comparison. This demonstrates the interaction pro-environmental attitudes have with the way products are compared, in regards to their environmental impact.

Greater research needs to be conducted on this second aim of conservation psychology, on how to change environmental behaviours. The second study of this thesis addressed this second aim by examining the influence of advertising on attitudes and behaviours in an environmental context.

1.6 Present Research

Considering the fact that individuals need to be environmentally conscious across a wide range of behaviours and situations to make a positive impact on the environment, it makes sense to study stable traits rather than only situational ones (Markowitz et al., 2012). However, as previously mentioned, little research has gone into this area (Markowitz et al.,

2012; Milfont & Sibley, 2012). Furthermore, a problem with previous research is that it tends to assume that pro-environmental attitudes and behaviours are strongly linked, which has been shown to be over-simplistic (St. John et al., 2010). Lastly, the lack of research into empathy and altruism and related traits is surprising, as research claims it is through these traits that the Big Five is related to pro-environmental attitude and behaviours (Hirsh & Dolderman, 2007). Despite this, no study to this researcher's knowledge has attempted to control for empathy or other personality constructs when examining the Big Five and environmental conservation. It is because of this that the first study attempts to create a better picture of personality's relation to both pro-environmental attitudes and behaviour. To achieve this aim, the empathy scale (IPIP, 2015), altruism scale (IPIP, 2015), Locus of Control Behaviour scale (LCB; Craig, Franklin, & Andrews, 1984), Marlowe-Crowne social desirability scale (Crowne & Marlowe, 1960; Reynolds, 1982), M5-50 Questionnaire (McCord, 2002), Dirty Dozen scale (Jonason & Webster, 2010), NEP (Dunlap et al., 2000). Biophilic Attitudes Inventory (BIA; Letourneau, 2013), and the created animal education test and donation scale were used. By doing so, a more complete picture of why individuals hold pro-environmental attitudes, and act or don't act environmentally may be developed. As humans are the one species capable of preventing or reversing earth's ecological crisis, a greater understanding of why or how individuals interact with the environment is vital to creating campaigns and policies regarding environmental conservation. Through a more complete understanding of what types of individuals are more or less likely to act or think environmentally, programs and policies can be developed to target at risk individuals, with the hope of changing their actions to ones that are more environmentally sustainable.

As stated earlier, conservation psychology is not only aimed at simply understanding why individuals act or do not act environmentally, but is also aimed at knowing how to change individuals' behaviour to be more environmental (Clayton & Brook, 2005). Research has primarily focussed on the first aim, and little has gone into this second aim of conservation

psychology. Due to this, the second study aimed to examine how differently imaged adverts influenced pro-environmental attitudes and behaviours. To achieve this aim this study used the same empathy, altruism, LCB, M5-50, NEP, and donation scale as Study 1, as well as the created efficacy scales. In doing so, this researcher aims to create a better understanding of how imagery in adverts works in the environmental domain. This greater understanding might allow agencies, governments, or other organisations to create more effective adverts and campaigns. As a result these campaigns and adverts might be more effective at enhancing or promoting pro-environmental attitudes and behaviours, which is needed to combat earth's ecological crisis.

1.7 Aims and Hypotheses

1.7.1 Study 1. The aim of this first study was to examine the links between personality factors and pro-environmental attitudes and behaviour.

Hypothesis One: Increased empathy, altruism, Extraversion, Agreeableness, and Openness (as measured by the empathy, altruism, and M5-50 Questionnaire) would have a positive relationship with pro-environmental attitudes, as measured by the NEP and BIA. The Dark Triad, external LOC, and Neuroticism (as measured by the Dirty Dozen, LCB, and M5-50) would be negatively related to pro-environmental attitudes, as measured by the NEP and BIA.

Hypothesis Two: Pro-environmental attitudes, increased empathy, altruism, Extraversion, Agreeableness, and Openness (as measured by the NEP, BIA, empathy, altruism, and M5-50 Questionnaire) would have a positive relationship with pro-environmental behaviour, as measured by the donation scale. The Dark Triad, external LOC, and Neuroticism (as measured by the Dirty Dozen, LCB, and M5-50) would be negatively related to pro-environmental behaviour, as measured by the donation scale.

1.7.2 Study 2. The aim of Study 2 was to examine the effectiveness of positively vs. negatively imaged advertising campaigns on pro-environmental attitudes and behaviour.

Hypothesis Three: Negatively imaged advertising would have a stronger effect on pro-environmental attitudes, as measured by the NEP, than positively imaged advertising when there was lower efficacy in the message.

Hypothesis Four: Negatively imaged advertising would have a stronger effect on pro-environmental behaviour, as measured by the donation scale, than positively imaged advertising when there was lower efficacy in the message.

Hypothesis Five: Negatively imaged advertising would have a stronger effect on pro-environmental behaviour, as measured by the donation scale, than positively imaged advertising when individuals had lower levels of pro-environmental attitude, as measured by the NEP.

Study 1

2. Method

2.1 Participants

This study initially consisted of 369 participants; however, 132 participants were removed from this study for not providing enough information, attempting the test again (first attempt was taken) or failing to follow instructions properly. Of these, 160 participants were drawn from the first year psychology pool; with 53 being excluded for the aforementioned reasons. The remaining 209 participants were drawn from online sources (social media, forums, research sites); with 79 participants being excluded for the above reasons. Thus, after removal there were 237 participants.

The gender breakdown of the first year psychology sample was 15.0% male, 84.1% female, and 0.9% other. Ages ranged from 17 to 59, with a mean age of 20.24 (*SD* = 6.77). All 107 (100%) participants lived in Australia.

The gender breakdown of the online sample was 30.8% male, 67.6% female, and 1.5% other. Ages ranged from 15 to 73, with a mean age of 30.12 (*SD* = 12.87). The country breakdown of this sample consisted of 42 (32.3%) Australian, 43 (33.1%) USA, 11 (8.4%) UK, 7 (5.3%) Canadian, and 27 (20.6%) other.

Thus the combined sample's gender breakdown was 23.6% male, 75.1% female, and 1.3% other. Ages ranged from 15 to 73, with a mean age of 25.70 (*SD* = 11.65). The country breakdown of this sample was thus 149 (62.9%) Australian, 43 (18.1%) USA, 11 (4.6%) UK, and 34 (14.2%) other. A full list of the nationality breakdown of all participants can be seen in Appendix A.

2.2 Measures

This study consisted of 10 scales which assessed the various constructs of interest, as well as a number of demographic questions. For a complete set of questions please see Appendix B.

2.2.1 Animal Education Test. The animal education test was developed for this study to provide a brief test of animal knowledge. This measure was based on a similar test with items based around and including some of the sample questions found in Kellert and Berry's study (1987). This scale consists of 15 statements (e.g., Spiders have 10 legs), that participants were to select whether they were true or false. Scores were calculated by adding a mark for every correct answer, and no mark for every wrong or unanswered statement. This gave a possible range of scores from 0-15. In the present study KR-20s were, $\alpha = 0.393$ for the psychology pool sample, $\alpha = 0.571$ for the online sample, and $\alpha = 0.526$ for the overall sample. Since these values indicated poor internal consistency, they suggest that this measure is not a reliable measure of animal education; as such it was not used in further analyses.

2.2.2 Empathy. Empathy was assessed using the empathy scale developed by the International Personality Item Pool and based on the Jackson Personality Inventory (IPIP, 2015).This scale consists of 10 items (e.g., Cry easily), which participants rated on a 5-point

Likert scale, 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), how much they agreed that the statement was true of themselves. A total score was calculated by adding scores on each item, giving a possibly empathy score ranging from 10 to 50, with a higher score indicating greater empathy. Past Cronbach's alpha for this scale have been good, $\alpha = 0.800$ (IPIP, 2015). In the present study $\alpha = 0.797$ for the psychology pool sample, $\alpha = 0.868$ for the online sample, and $\alpha = 0.845$ for the overall sample, these values indicate good internal consistency.

2.2.3 Altruism. Altruism was assessed using the altruism scale developed by the International Personality Item Pool (IPIP, 2015).This scale consisted of 10 items (e.g., Love to help others), which participants rated on a 5-point Likert scale, 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), how true each statement was of them now, not as they wished to be. A total score was calculated by adding scores on each item, with 5 reverse scored items, giving a total score ranging from 10 to 50, with a higher score indicating higher levels of altruism. Past Cronbach's alpha for this scale have been good, $\alpha = 0.77$ (IPIP, 2015). In the present study $\alpha = 0.795$ for the psychology pool sample, $\alpha = 0.873$ for the online sample, and $\alpha = 0.849$ for the overall sample, indicating good internal consistency.

2.2.4 Locus of Control (LOC). The commonly used Locus of Control Behaviour scale (LCB; Craig et al., 1984) was used to assess participants' LOC beliefs. This scale consisted of 14 statements (e.g., I can anticipate difficulties and take action to avoid them), in which participants were asked on a 6-point Likert scale, 1 (*Strongly Disagree*) to 6 (*Strongly Agree*), how much they agreed with each statement. An external LOC score was calculated by summing its corresponding 8 items and an internal LOC score was calculated by summing its corresponding 6 items. A total LOC score was thus calculated by subtracting the internal LOC score from the external LOC score. This gives a possible range -28 to 42 for the total LOC, with higher scores indicating greater external LOC. For this study a KR-20 of 0.737 (first year sample), 0.808 (online sample), and 0.778 (overall sample) was found, indicating acceptable to good internal consistency.

2.2.5 Social Desirability. A shortened 13-item form of the Marlowe-Crowne Social Desirability scale (Crowne & Marlowe, 1960; Reynolds, 1982) was used to assess the social desirability of participants. This scale consisted of 13 true or false statements (e.g., I am sometimes irritated by people who ask favours of me). A total score was calculated by scoring true responses as 0 and false responses as 1, with 5 items reverse scored. This gave a possible social desirability score of 0-15, with a higher score indicating higher levels of social desirability. Past studies have had a KR-20 of 0.62, which is acceptable (Loo & Thorpe, 2000). For this study a KR-20 of 0.740 for the psychology pool sample, 0.764 for the online sample, and 0.752 for the overall sample was found, these values indicated acceptable internal consistency.

2.2.6 Personality Scale. The M5-50 Questionnaire (McCord, 2002) was used to assess participants' personality on the Big Five. This scale consisted of 50 statements in which participants were asked to rate on a 5-point Likert scale, ranging from 1 (*inaccurate*) to 5 (*accurate*), how true the statements were of them. This measure consisted of the five subscales: Openness to Experience (e.g., Have a vivid imagination), Conscientiousness (e.g., Get chores done right away), Extraversion (e.g., Make friends easily), Agreeableness (e.g., Accept people as they are), and Neuroticism (e.g., Panic easily). Of these 50 statements 26 were reverse scored. A total score was given for each subscale, by getting the mean of the 10 statements that tapped that construct. This gave each subscale a possible range of 1-5, with higher scores indicating higher levels of that construct. This scale has been used in a number of published studies and has been found to have good internal consistency, with Cronbach's alphas ranging from 0.759-0.864 for its subscales (McCord, 2002). In the present study α = 0.741-0.878 for the psychology pool sample, α = 0.797-0.908 for the online sample, and α = 0.781-0.893 for the overall sample indicating acceptable to excellent internal consistency. This scale was slightly modified so that participants were asked if they voted for conservative candidates before a similar question in regards to liberal ones (i.e., the order of these

questions were swapped from their original position in the scale). This was done as this author found in a previous study (Soutter & Hitchens, 2016) reliability was negatively influenced in Australian samples when left in its original form, as the conservative party is called the Liberal party in Australia.

2.2.7 Dirty Dozen. The Dirty Dozen scale (Jonason & Webster, 2010) was used to measure psychopathy, narcissism, and Machiavellianism. This measure consisted of 12 items, measuring psychopathy (e.g., I tend to lack remorse), narcissism (e.g., I tend to want others to admire me), and Machiavellianism (e.g., I have used deceit or lied to get my way). Participants were asked to rate themselves truthfully on a 9-point Likert scale, ranging from 1 (*Disagree Strongly*) to 9 (*Agree Strongly*). A score for each of these personality traits was calculated by taking the average of all 4 scores on their corresponding items, giving each trait a possible range of 1 to 9; with higher scores indicating higher levels of these traits. Past Cronbach's alphas have been reported as $\alpha = 0.73$ for psychopathy, $\alpha = 0.83$ for narcissism, and $\alpha = 0.81$ for Machiavellianism (Jonason & Webster, 2010). These past Cronbach's alphas suggest these scales have acceptable to good internal consistency. For this study $\alpha = 0.785$, 0.890, and 0.878 for the psychology pool sample, $\alpha = 0.798$, 0.855, and 0.817 for the online sample, and $\alpha = 0.792$, 0.871, and 0.846 for the overall sample, for psychopathy, narcissism, and Machiavellianism respectively. These values indicated good internal consistency.

2.2.8 NEP-15 Item Scale. The New Environmental Paradigm, otherwise known as the revised NEP (Dunlap et al., 2000), was used to assess pro-environmental attitudes. This 15 item measure (e.g., Humans are severely abusing the environment) requires participants to rate each statement on a 7-point scale, ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). A total score was calculated by summing all 15 items together, with 8 of the items being reverse scored. This gave a possible range of scores from 15 to 105, with higher scores indicating more pro-environmental attitudes. Past Cronbach's alpha has been reported as $\alpha = 0.75$ (Tarrant, Bright, & Cordell, 2008). For this study the psychology pool sample had an α

= 0.660, the online sample α = 0.863, and the overall sample α = 0.813. These values indicate acceptable to good internal consistency.

2.2.9 Biophilic Attitudes Inventory. A second scale, the Biophilic Attitudes Inventory (BIA; Letourneau, 2013), was used to measure pro-environmental attitudes. This scale consisted of 48 items (e.g., It is ok for animals to eat each other to survive), in which participants rated on a 5-point Likert scale, ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), how much they agreed with each statement. This scale consisted of 7 sub-scales consisting of Dominionistic, Ecological/Scientism, Humanism, Moralism, Naturalism, Negativism, and Utilitarianism. Scores on the respective items for each sub-scale were added to calculate a score for each typology, with higher scores indicating higher levels of that typology. For the first year sample Ecological/Scientism, Humanism, Naturalism, and Negativism had acceptable to good reliability (α = 0.668-0.848), Utilitarianism had unacceptable reliability (α = 0.618), whereas Dominionistic and Moralism had questionable reliability (α = 0.564, 0.211).The online sample had acceptable reliability (α = 0.661-0.808) for Dominionistic, Ecological/Scientism, Moralism, Naturalism, and Negativism, while Humanism was poor (α = 0.532), whereas Utilitarianism had unacceptable reliability (α = 0.365). Lastly, when combined Ecological/Scientism, Naturalism, and Negativism had acceptable to good reliability (α = 0.689-0.841), while Dominionistic, Moralism, and Humanism had questionable reliability (α = 0.596-0.649), whereas Utilitarianism had unacceptable reliability (α = 0.292).

2.2.10 Donation Scale. A behavioural measure of pro-environmental behaviour was created as there does not appear to be a consistent measure of pro-environmental behaviour in the literature. This scale was roughly modelled after the dictator game (Khaneman, Knetsch, & Thaler, 1986) and the dependent measure used in Soliño and Farizo's study (2014). This was done to create a more ecologically valid measure of pro-environmental behaviour, focussing on a real life situation (donating to charities).This measure consisted of brief

descriptions of three different charities [WWF (environment), BasicNeeds (mental health), and OXFAM (poverty)] taken from their websites (BasicNeeds, 2015; OXFAM, 2015a; OXFAM, 2015b; WWF, 2015). A full description can be found in Appendix C. After participants read these descriptions they were told they had $100 spare cash and were asked how they would spend the money between these three charities, and an option to keep the money. Participants could allocate any amount to each group, as long as the total across all was $100. A score was calculated for each option by dividing a participant's contribution to that option by 100. Participants were also given the option of explaining why they had split the money the way they did.

2.3. Procedure

This study was approved by the Macquarie University Human Research Ethics Committee (Reference number: 5201500040). Participants were recruited either through the Macquarie University participant pool website (SONA; refer to Appendix D) or online websites and social media (refer to Appendix E). Furthermore, at the end of the survey participants were given a link they could refer friends or others to. Participants were split into two groups: first year psychology students (drawn from SONA) and online community (drawn from online sources). These groups were directed to separate links, containing identical surveys, except SONA participants were given the option 'do not wish to respond' for every question. Each link first asked participants to read an Information and Consent form (refer to Appendix F), which was accepted before continuing onto the survey.

Participants initially completed a set of demographic questions, as well as the animal education test. Thereafter they completed in a randomised order the personality questions (empathy, altruism, LOC, social desirability, Big Five, and the Dirty Dozen). Lastly, participants completed in a random order the two pro-environmental attitude scales (NEP and BIA) as well as the donation scale.

3. Results

3.1 Preliminary Analysis

Due to the poor reliability of the majority of the BIA scales, Kellert's typologies were dropped from hypothesis one, and subsequently only those subscales found to have good reliability were included in hypothesis two. Kellert's typologies were not included in the analysis of hypothesis one, due to the fact that the majority of scales were unreliable. As a result Kellert's typologies could not be properly examined in their entirety, and thus made them unsuitable as a dependent variable. However, those that were reliable were included in the analysis for hypothesis two to maximise the regression's predictive power and to increase control of extraneous variables.

Before analyses were performed, a preliminary analysis was conducted to ensure that there was no difference between the online sample and the first year psychology student sample on any of the dependent variable measures (i.e., NEP, donation to WWF). Independent samples t-tests were conducted to examine whether sample group was related to these scales. This analysis found there was no significant difference between the groups on donation to WWF ($p>0.05$). However, there was a significant difference between groups on the NEP ($t = 3.498$, $p = 0.001$; equal variance not assumed) indicating that the online sample scored higher on the NEP than the psychology sample ($MD = 5.16$). Due to these findings, group membership was added as a covariate for the first hypothesis.

As the gender category of 'other' was not well represented, it was not possible to make comparisons between this category and the categories of male and female. Due to this these three participants who identified as other were removed from all subsequent analyses.

3.2 Assumptions and Error Rate

All analyses were conducted using SPSS (version 22). The assumptions of multiple linear regression (linearity, independence, homoscedacity, normality, and multicollinearity) were met only for hypothesis 1. For hypothesis 2 the assumptions of normality and

homoscedacity were violated for the combined sample as can be seen in Appendix G. However, as normality is only an issue for small samples (Field, 2013), and due to the relatively large sample size of the study, the violations were not expected to influence the outcomes of the analyses. Furthermore, multiple linear regression is fairly robust to slight violations of normality (Field, 2013). For these reasons, it was decided that violations of normality were not significant enough to warrant any changes. In regards to violations of homoscedacity, multiple linear regression is also robust to slight violations (Statistics Solutions, 2013). For all hypotheses a series of multiple linear regressions with model reduction were performed with significance set at $p<0.05$.

3.3 Descriptive Statistics

Descriptive statistics for all scales are reported in Table 2. A correlation matrix of variables can be found in Appendix H.

Table 2

Descriptive Statistics for Study 1.

Variable	*n*	*M*	*SD*	Possible Range		Actual Range	
				Minimum	Maximum	Minimum	Maximum
Animal Education	234	12.03	2.03	0	15	6	15
Empathy	234	36.00	7.00	10	50	15	50
Altruism	234	39.88	5.55	10	50	16	50
Locus of Control	234	-4.00	8.65	-28	42	-22	24
Social Desirability	234	5.81	3.11	0	15	0	13
NEP	234	76.55	11.95	15	105	21	104
Personality Scale							
Openness	234	3.82	0.65	1.00	5.00	1.70	5.00
Conscientiousness	234	3.46	0.76	1.00	5.00	1.20	5.00
Extraversion	234	3.17	0.85	1.00	5.00	1.00	4.90

Agreeableness	234	3.77	0.59	1.00	5.00	1.80	4.90
Neuroticism	234	2.90	0.86	1.00	5.00	1.00	5.00
Dirty Dozen							
Psychopathy	234	2.79	1.65	1.00	9.00	1.00	8.25
Narcissism	234	4.70	1.95	1.00	9.00	1.00	9.00
Machiavellianism	234	3.82	1.89	1.00	9.00	1.00	8.50
Biophilic Attitudes Inventory							
Dominionistic	234	15.80	3.90	6	30	6	26
Ecological/Scientism	234	35.92	6.22	9	45	15	45
Humanism	234	26.78	3.81	7	35	16	35
Moralism	234	25.85	3.37	6	30	10	30
Naturalism	234	32.93	4.73	8	40	17	40
Negativism	234	17.38	4.93	7	35	8	35
Utilitarianism	234	16.29	2.70	5	25	10	23
Donation Scale							
Oxfam	234	0.29	0.20	0.00	1.00	0.00	1.00
WWF	234	0.25	0.20	0.00	1.00	0.00	1.00
BasicNeeds	234	0.26	0.18	0.00	1.00	0.00	1.00
Kept for Self	234	0.21	0.30	0.00	1.00	0.00	1.00

3.4 Hypothesis One

It was hypothesised that pro-environmental attitudes would be positively related to empathy, altruism, Extraversion, Agreeableness, and Openness. While the Dark Triad, external LOC, and Neuroticism would be negatively related to pro-environmental attitudes.

A multiple linear regression with model reduction was conducted, with NEP score as the dependent variable. The original model before reduction included the predictors of the Big Five (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism), empathy, altruism, LOC, the Dark Triad (psychopathy, narcissism, and Machiavellianism). It also

included the demographic variables of age, gender, pet ownership, number of pets, property damage, personal injury, and area (rural or urban). Social desirability and group membership were included as covariates. The analysis revealed that the model with all predictors included was significant, $F(20,211) = 3.769$, $p<0.0005$, $R^2 = 0.263$, $R^2_{Adjusted} = 0.193$.

Model reduction was then performed, removing variables based on an alpha of 0.05. After model reduction was conducted only the variables of social desirability, LOC, narcissism, altruism, Openness, group membership, area (rural or urban), property damage, and pet ownership remained. This new model was significant, $F(9,222) = 7.727$, $p<0.0005$, $R^2 = 0.239$, $R^2_{Adjusted} = 0.208$. Through model reduction 11 variables were removed with only a reduction in R^2 of 0.024, and an improvement of $R^2_{Adjusted}$ of 0.015. See Table 3 for a summary of regression results.

Social desirability and group membership were not investigated as they were simply added to control for these factors. Holding all other variables constant, those with a higher level of altruism also had a higher level of pro-environmental attitude ($b = 0.499$, 95% CI [0.197, 0.801], $p = 0.001$). Holding all other variables constant, those who scored higher in Openness were also found to have higher levels of pro-environmental attitude ($b = 4.374$, 95% CI [2.075, 6.672], $p<0.0005$). It was found after holding all other variables constant that a greater external LOC was related to an increased pro-environmental attitude ($b = 0.193$, 95% CI [0.021, 0.366], $p = 0.028$). It was further found that ownership of pet(s), holding all other variables constant, was related to an increased pro-environmental attitude ($b = 3.272$, 95% CI [0.340, 6.203], $p = 0.029$). It was also found that those in urban compared to rural areas, holding all other variables constant, was also related to an increased pro-environmental attitude ($b = 5.440$, 95% CI [1.125, 9.754], $p = 0.014$). Openness ($\beta = 0.237$) and altruism ($\beta = 0.231$) appear to be the two strongest predictors when compared with the significant variables of LOC ($\beta = 0.140$), area ($\beta = 0.151$), and pet ownership ($\beta = 0.131$).

Table 3

Summary of Model Reduction for Hypothesis One

Variable	*B*	*SE B*	*β*
	Model 1		
Age	0.087	0.073	0.086
Number of Pets	0.046	0.290	0.011
Social Desirability	-0.789	0.311	-0.206*
Locus of Control	0.199	0.107	0.144
Narcissism	-0.647	0.464	-0.106
Psychopathy	-5.65	0.724	-0.078
Machiavellianism	-3.82	0.583	-0.060
Empathy	-0.030	0.152	-0.017
Altruism	0.411	0.212	0.191
Extraversion	0.636	1.138	0.045
Agreeableness	-1.330	1.897	-0.065
Conscientiousness	0.801	1.263	0.051
Neuroticism	1.472	1.307	0.106
Openness	4.256	1.252	0.231**
Gender	0.794	1.994	0.028
Group	-4.254	1.804	-0.178*
Area(Rural or Urban)	4.943	2.269	0.137*
Property Damage	3.814	2.467	0.096
Injury	-1.439	1.984	-0.046
Pet Ownership	-2.506	1.731	-0.100
R^2	0.263	$R^2_{Adjusted}$	0.193
F	3.769***		
	Model 2		

Social Desirability	-0.803	0.263	-0.209**
Locus of Control	0.193	0.088	0.140*
Narcissism	-0.776	0.397	-0.127
Altruism	0.499	0.153	0.231**
Openness	4.374	1.167	0.237***
Group	-4.811	1.534	-0.201**
Area(Rural or Urban)	5.440	2.189	0.151*
Property damage	4.225	2.370	0.106
Pet Ownership	-3.272	1.488	-0.131*
R^2	0.239	$R^2_{Adjusted}$	0.208
F	7.727***		

Note: N= 235, *$p \leq 0.05$, **$p \leq 0.005$, ***$p \leq 0.0005$

3.5 Hypothesis Two

It was hypothesised that pro-environmental attitudes, increased empathy, altruism, Extraversion, Agreeableness, and Openness would have a positive relationship with pro-environmental behaviour and that the Dark Triad, external LOC, and Neuroticism would be negatively related to pro-environmental behaviour.

A multiple linear regression with model reduction was conducted, with donation to WWF as the dependent variable. The predictors of the Big Five (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism), empathy, altruism, LOC, the Dark Triad (psychopathy, narcissism, and Machiavellianism), NEP, Ecological/Scientism, Naturalism, and Negativism were included in the model. It also included the demographic variables of age, gender, pet ownership, number of pets, property damage, personal injury, and area (rural or urban). Social desirability was added as a covariate in the model. The analysis revealed that this original model was significant, $F(23,208) = 2.933$, $p<0.0005$, $R^2 = 0.245$, $R^2_{Adjusted} = 0.161$.

Model reduction was then conducted which removed variables, based on an alpha of 0.05. After model reduction was conducted only NEP, Ecological/Scientism typology, psychopathy, Agreeableness, and social desirability remained. This new model was significant, $F(5,226) = 11.081$, $p<0.0005$, $R^2 = 0.197$, $R^2_{Adjusted} = 0.179$. Through model reduction 18 variables were removed with only a reduction in R^2 of 0.048, and an increase of $R^2_{Adjusted}$ of 0.018. See Table 4 for a summary of regression results.

Holding all variables constant, those who scored higher on the NEP also donated more to WWF ($b = 0.006$, 95% CI [0.003, 0.008], $p<0.0005$). Holding all other variables constant, higher scores on psychopathy were related to lower amounts donated to WWF ($b= -0.020$, 95% CI [-0.038, -0.001], $p = 0.034$). Lastly, holding all other variables constant, those who scored higher on Agreeableness donated less to WWF ($b = -0.058$, 95% CI [-0.114, -0.002], $p = 0.041$). Pro-environmental attitudes measured by the NEP appear to be the strongest predictor ($\beta = 0.334$) compared to the variables of, psychopathy ($\beta = -0.165$), and Agreeableness ($\beta = -0.172$).

Table 4

Summary of Model Reduction for Hypothesis Two

Variable	*B*	*SE B*	*β*
	Model 1		
Age	-0.001	0.001	-0.043
Number of Pets	-0.001	0.005	-0.031
Social Desirability	0.010	0.005	0.158
NEP	0.005	0.001	0.321***
Ecological/Scientism	0.005	0.003	0.158
Naturalism	-0.003	0.004	-0.064
Negativism	-0.001	0.003	-0.028
Locus of Control	0.001	0.002	0.025

Narcissism	-0.004	0.008	-0.038
Psychopathy	-0.021	0.012	-0.180
Machiavellianism	-0.008	0.010	-0.075
Empathy	-0.002	0.003	-0.083
Altruism	-0.000	0.004	-0.012
Extraversion	0.010	0.020	0.043
Agreeableness	-0.051	0.032	-0.149
Conscientiousness	0.029	0.021	0.113
Neuroticism	0.046	0.022	0.197*
Openness	-0.004	0.022	-0.013
Gender	-0.017	0.034	-0.036
Area(Rural or Urban)	0.047	0.038	0.079
Property Damage	-0.042	0.042	-0.063
Injury	0.034	0.034	0.065
Pet Ownership	-0.037	0.030	-0.089
R^2	0.245	$R^2_{Adjusted}$	0.161
F	2.933***		
	Model 2		
Social Desirability	0.011	0.004	0.179*
NEP	0.006	0.001	0.334***
Ecological/Scientism	0.004	0.002	0.118
Psychopathy	-0.020	0.009	-0.165*
Agreeableness	-0.058	0.028	-0.172*
R^2	0.197	$R^2_{Adjusted}$	0.179
F	11.081***		

Note: N= 232, *$p \leq 0.05$, **$p \leq 0.005$, ***$p \leq 0.0005$

Study 2

4. Method

4.1 Participants

Study 2 consisted of 125 participants, 96 (76.8%) female, 28 (22.4%) male, and 1 (0.8%) other, who were recruited from a first-year psychology pool at Macquarie University and received course credit as compensation. Ages of participants ranged from 17 to 72, with a mean age of 21.58 (*SD* = 8.24).

Participants were presented one of three brochures (described below), this brochure was either positively imaged (n = 41), negatively imaged (n = 44), or neutrally imaged (n = 40).

4.2 Measures

This study consisted of seven scales, primarily taken from the first study. Building on Study 1, those questionnaires that had poor reliability (Kellert's typologies and Animal education) were removed. Furthermore, a number of demographic questions, the Dark Triad scale, and social desirability scale were also removed to ensure the brevity of the survey. See Appendix J for the full survey.

4.2.1 Efficacy Scales. Efficacy was measured through 4 questions. Three questions asked participants to rate on a 10 point scale, 1 (*Not at all*) to 10 (*Extremely so*), how they would rate the efficacy of three items (Save the Planet [the environmental charity advertised], one's self, and the act of donating to charity) in being able to help the environment. Furthermore, participants were asked on a forced choice scale of 10 points with the anchors consisting of 'Non-profit organisations' and 'Individual efforts', which was more effective at helping the environment.

4.2.2 Empathy Scale. The empathy scale used in Study 1 was used again with no changes. In Study 2 this scale had an acceptable internal consistency ($\alpha = 0.769$).

4.2.3 Altruism Scale. The altruism scale used in Study 1 was used again with no changes. In Study 2 this scale had an acceptable internal consistency ($\alpha = 0.767$).

4.2.4 Locus of Control (LOC). The LOC scale used in Study 1 was used again with no changes. In Study 2 this scale had an acceptable internal consistency ($\alpha = 0.757$).

4.2.5 Personality Scale. The Big Five personality scale used in Study 1 was used again with no changes. In Study 2 the sub-scales had acceptable to good internal consistency ($\alpha = 0.707$-0.855).

4.2.6 NEP-15 Item Scale. The NEP scale used in Study 1 was used again with no changes. In Study 2 this scale had an acceptable internal consistency ($\alpha = 0.754$).

4.2.7 Donation Scale. The donation scale used in Study 1 was used again, except that the name WWF was swapped for Save the Planet in the description and option to donate to. Furthermore, the description was slightly changed (see Appendix K).This was done as the brochures were for this fictional environmental organisation.

4.2.8 Brochures. Participants were randomly assigned to one of three conditions (positive, negative, and neutral brochures—see Appendix L). All participants in a single testing had the same brochure. All three brochures were identical, except for the three images inside. Each image was matched with a similar content one as can be seen in Appendix L (e.g., clean beach in positive vs. dirty beach in negative). Brochures were used as they were an easy form of communicating information about the environment; furthermore they are commonly used with environmental organisations and governments to promote environmental campaigns and policies. Thus, they reflected a real life mode of communicating environmental awareness, while also being easy to develop. Furthermore, the use of a brochure allowed the manipulation of images to be subtly and easily done. By creating brochures instead of using already made ones it was possible to keep consistency across all other areas apart from the images. This allowed the true purpose of this study (examining image valence) to be less obvious than simply presenting images in isolation. The brochures

were designed to replicate brochures that are often found and environmental centres, zoos, and other such places.

4.3 Procedure

This study was approved by the Macquarie University Human Research Ethics Committee (Reference number: 5201500040). Participants were recruited through the Macquarie University psychology participant pool website (SONA; see Appendix M).

Participants were tested in groups of one to three, and during testing were unable to see each other or the head researcher, in order to minimise social pressure on responses. Participants were given an informed consent form (see Appendix N), and after giving consent were given a brief explanation of the study, but were blinded to the hypotheses in regards to different conditions.

Participants were instructed to read through the brochure before beginning the online survey. Demographic information was collected first, and then the various efficacy measures. Participants then completed in a random order the empathy, altruism, LOC, and Big Five measure. Lastly, the NEP and donation scale were completed in a random order. Once participants completed the survey they were given a quick debrief re-explaining what the study was about and asking participants not to tell others about the content of the brochure.

5. Results

5.1 Preliminary Analysis, Assumptions, and Error Rate

Due to the small representation of the gender category ‘other’ (n = 1), comparisons to this group were not possible, and thus this one participant was removed from subsequent analyses. This left the neutral brochure condition with 39 participants.

All analysis was conducted using SPSS (version 22). The assumptions of multiple linear regression (linearity, independence, homoscedacity, normality, and multicollinearity) were all met for hypothesis three. However, the assumption of normality was violated for hypothesis four and five, as can be seen in Appendix O. However, multiple linear regression

is fairly robust to slight violations of normality, as found here (Field, 2013). For all hypotheses a series of multiple linear regressions with model reduction was performed with significance set at $p<0.05$. Furthermore, for all hypotheses that included an interaction term, the continuous variable of efficacy Save the Planet and/or NEP were centred at their mean.

Bonferroni Adjustments were applied when comparisons of groups were involved in the final model, setting $\alpha = 0.017$. However, this was not necessary as significance for comparisons was well above or below this level, so will not be mentioned again.

5.2 Descriptive Statistics

Descriptive statistics for all scales are reported in Table 5. A correlation matrix of variables can be found in Appendix P.

Table 5

Descriptive Statistics for Study 2.

Variable	*n*	*M*	*SD*	Possible range		Actual Range	
				Minimum	Maximum	Minimum	Maximum
Efficacy Save the Planet	124	7.20	1.68	1	10	1	10
Efficacy One's Self	123	5.92	1.92	1	10	1	10
Efficacy Donating to Charity	123	5.50	1.80	1	10	1	10
Efficacy Non-Profit vs. Individual Efforts	124	4.83	2.59	1	10	1	10
Empathy	124	35.74	5.41	10	50	21	49
Altruism	124	40.95	4.28	10	50	31	49
Locus of Control	124	-5.42	7.60	-28	42	-23	21

NEP	124	75.94	10.04	15	105	45	102
Personality Scale							
Openness	124	3.77	0.53	1.00	5.00	2.40	5.00
Conscientiousness	124	3.47	0.66	1.00	5.00	1.40	5.00
Extraversion	124	3.30	0.70	1.00	5.00	1.60	4.60
Agreeableness	124	3.85	0.48	1.00	5.00	2.50	4.80
Neuroticism	124	2.72	0.66	1.00	5.00	1.30	4.10
Donation Scale							
Oxfam	124	0.32	0.16	0.00	1.00	0.00	1.00
Save the Planet	124	0.27	0.16	0.00	1.00	0.00	0.80
BasicNeeds	124	0.25	0.12	0.00	1.00	0.00	0.60
Kept for self	124	0.17	0.21	0.00	1.00	0.00	1.00

5.3 Hypothesis Three

It was hypothesised that negatively imaged advertising would have a stronger effect on pro-environmental attitudes, as measured by the NEP, than positively imaged advertising when there was lower efficacy of the message. A multiple linear regression with model reduction was conducted, with the NEP as the dependent variable. The original model before reduction included the predictors of age, gender, LOC, empathy, altruism, Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism, efficacy of Save the Planet (centred at its mean), and brochure group (dummy coded). It also included the interaction terms of efficacy of Save the Planet with brochure group. The analysis was run with the neutral group coded as the reference group. The analysis revealed that the model with all predictors included was significant, $F(15, 108) = 2.770$, $p = 0.001$, $R^2 = 0.278$, $R^2_{Adjusted} = 0.178$. As the interaction terms were not significant ($p = 0.194$) the model was reduced to an additive model which was significant, $F(13, 110) = 2.905$, $p = 0.007$, $R^2 = 0.256$, $R^2_{Adjusted} = 0.168$.

Model reduction was then conducted by hand which removed variables, based on an alpha of 0.05, until all remaining variables were significant at a 0.05 level. After model reduction only the variables of gender, Openness, and brochure group remained. This new model was significant, $F(4, 119) = 7.448$, $p<0.0005$, $R^2 = 0.200$, $R^2_{Adjusted} = 0.173$. Through model reduction 9 variables were removed with an improvement in the $R^2_{Adjusted}$ of 0.005. See Table 6 for a summary of regression results.

Holding Openness constant and brochure group at neutral, females had higher pro-environmental attitude scores than males ($b = 6.324$, 95% CI [2.394, 10.255], $p = 0.02$). Holding gender constant at male and brochure group at neutral, those with a higher Openness score also had a higher pro-environmental attitude score ($b = 5.373$, 95% CI [2.245, 8.501], $p=0.001$). Holding Openness constant and gender at male, there was no difference between the negative brochure and the neutral brochure ($b = -1.658$, 95% CI [-5.653, 2.337], $p = 0.413$), but there was a significant difference between the positive brochure and the neutral brochure, in that those who received a positive brochure had a stronger pro-environmental attitude than those in the neutral group ($b = 5.162$, 95% CI [1.100, 9.224], $p = 0.013$). The final model was run again to get the last group comparison, which found that those who received a positive brochure had stronger pro-environmental attitudes than those who received a negative brochure ($b = 6.820$, 95% CI [2.879, 10.760], $p = 0.001$).

Table 6

Summary of Model Reduction for Hypothesis Three

Variable	*B*	*SE B*	*β*
		Model 1	
	0.052	0.112	0.043
Gender	6.923	2.193	0.289**
Locus of Control	-0.153	0.137	-0.116
Empathy	-0.027	0.197	-0.014

Altruism	0.479	0.278	0.204
Efficacy of Save the Planet (centred at mean)	0.461	0.508	0.077
Openness	4.160	1.763	0.218*
Conscientiousness	-1.721	1.617	-0.114
Extraversion	0.487	1.346	0.034
Agreeableness	-5.097	2.647	-0.244
Neuroticism	0.399	1.794	0.026
		Brochure group	
Positive (with neutral as reference)	4.665	2.096	0.219*
Negative (with neutral as reference)	-1.871	2.066	-0.090
Positive (with negative as reference)	6.537	2.036	0.307**
R^2	0.256	$R^2_{Adjusted}$	0.168
F	2.905**		
		Model 2	
Gender	6.324	1.985	0.264**
Openness	5.373	1.580	0.282**
		Brochure Group	
Positive (with	5.162	2.051	0.243*

neutral as reference)			
Negative (with neutral as reference)	-1.658	2.018	-0.079
Positive (with negative as reference)	6.820	1.990	0.321**
R^2	0.200	$R^2_{Adjusted}$	0.173
F	7.448***		

Note: N=124, *$p \leq 0.05$, ** $p \leq 0.005$, *** $p \leq 0.0005$

5.4 Hypothesis Four and Five

Hypothesis four and five were combined as they included the same variables. It was hypothesised that negatively imaged advertising would have a stronger effect on pro-environmental behaviour than positively imaged advertising when there was lower efficacy of the message. It was also hypothesised that negatively imaged advertising would have a stronger effect on pro-environmental behaviour than positively imaged advertising when individuals had lower levels of pro-environmental attitude.

A multiple linear regression with model reduction was conducted, with the donation to Save the Planet as the dependent variable. The original model before reduction included the predictors of age, gender, LOC, empathy, altruism, Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism, efficacy of Save the Planet (centred at its mean), NEP (centred at its mean), and brochure group (dummy coded). It also included the interaction terms of efficacy of Save the Planet with brochure group and NEP with brochure group. The analysis was run with the neutral group coded as the reference group. The analysis revealed that the model with all predictors included was significant, $F(18, 104) = 1.992$, $p =$

0.022, $R^2 = 0.250$, $R^2_{Adjusted} = 0.120$. As the interaction terms were not significant ($p = 0.518$ and $p = 0.384$) the model was reduced to an additive model which was significant, $F(14, 108) = 2.255$, $p = 0.10$, $R^2 = 0.226$, $R^2_{Adjusted} = 0.126$.

Model reduction was then conducted by hand which removed variables, based on an alpha of 0.05, until all remaining variables were significant at a 0.05 level. After model reduction only the variables of efficacy of Save the Planet, NEP, and Neuroticism remained. This new model was significant, $F(3, 119) = 8.603$, $p \leq 0.0005$, $R^2 = 0.178$, $R^2_{Adjusted} = 0.158$. Through model reduction 10 variables were removed with an improvement in the $R^2_{Adjusted}$ of 0.032. See Table 7 for a summary of regression results. When holding NEP and efficacy of Save the Planet constant, those with higher Neuroticism donated less to Save the Planet ($b = -0.061$, 95% CI [-0.101, -0.021], $p = 0.003$). Holding Neuroticism and efficacy towards Save the Planet constant, those with a higher NEP donated more to Save the Planet ($b = 0.005$, 95% CI [0.003,0.008], $p \leq 0.0005$).

Table 7

Summary of Model Reduction for Hypothesis Four and Five

Variable	*B*	*SE B*	*β*
	Model 1		
Age	0.000	0.002	0.009
Gender	0.019	0.037	0.049
Efficacy Save the Planet	0.016	0.008	0.172
NEP	0.006	0.002	0.352***
Locus of Control	-0.001	0.002	-0.071
Empathy	-0.005	0.003	-0.156
Altruism	-0.001	0.005	-0.029
Openness	0.016	0.029	0.053

Conscientiousness	0.006	0.027	0.025
Extraversion	-0.016	0.022	-0.069
Agreeableness	0.028	0.044	0.084
Neuroticism	-0.036	0.030	-0.151
		Brochure Group	
Positive (with neutral as reference)	-0.045	0.035	-0.134
Negative (with neutral as reference)	-0.002	0.034	-0.006
Positive (with negative as reference)	-0.043	0.035	-0.129
R^2	0.226	$R^2_{Adjusted}$	0.126
F	2.255*		
		Model 2	
NEP	0.005	0.001	0.330***
Neuroticism	-0.061	0.020	-0.253**
Efficacy of Save the Planet	0.015	0.008	0.161
R^2	0.178	$R^2_{Adjusted}$	0.158
F	8.603***		

Note: N=124, *$p \leq 0.05$, ** $p \leq 0.005$, *** $p \leq 0.0005$

6. Discussion

6.1 Study 1

This first study aimed to explore the relationship between a number of personality characteristics, pro-environmental attitudes, and pro-environmental behaviour. This aim was achieved by first examining how a number of personality characteristics were related to pro-environmental attitudes, as measured by the New Environmental Paradigm (NEP). This study then examined how these personality and demographic characteristics as well as pro-environmental attitudes, measured by both the NEP and Kellert's typologies, were related to pro-environmental behaviour. In regards to the previously stated hypotheses, this study examined hypothesis one and two. To make the comparison between attitudes and behaviours more apparent, this discussion will talk about hypothesis one and two together.

6.1.1 Fate of Hypotheses

Hypothesis one predicted that empathy, altruism, Extraversion, Agreeableness, and Openness would have a positive relationship with pro-environmental *attitudes,* while the Dark Triad, external LOC, and Neuroticism would be negatively related to pro-environmental attitudes. This hypothesis was only partially supported; insofar that altruism and Openness had a positive relationship with pro-environmental attitudes.

Hypothesis two predicted that pro-environmental attitudes, increased empathy, altruism, Extraversion, Agreeableness, and Openness would have a positive relationship with pro-environmental *behaviour*, while the Dark Triad, external LOC, and Neuroticism would be negatively related to pro-environmental behaviour. This hypothesis was only partially supported. Pro-environmental attitudes, as measured by the NEP, had a positive relationship with pro-environmental behaviour, and psychopathy was found to be negatively related to pro-environmental behaviour as predicted. However, Agreeableness was found to be negatively related to pro-environmental behaviour, which was counter to what was hypothesised.

6.1.2 Significant Predicted Findings

A greater external LOC was predicted to be negatively related to pro-environmental attitudes and behaviour. Study 1 however, found that a greater external LOC was *positively* related to pro-environmental attitudes, but not related to pro-environmental behaviour. These relationships are counter to past research which suggests there should be a negative relationship between external LOC and pro-environmental attitudes and behaviour (Barney et al., 2005; Dimopoulous & Pantis, 2003; Kollmuss & Agyeman, 2002). This is believed to occur because those with an external LOC believe that only the actions of other external forces such as big corporations and God can affect the environment (Dimopoulous & Pantis, 2003; Kollmuss & Agyeman, 2002). Furthermore, it is believed that by believing their actions cannot affect changes, those with an external LOC retreat into apathy, or other similar mindsets towards environmental issues (Kollmuss & Agyeman, 2002). In regards to pro-environmental attitudes, one possible reason of this study's inversed relationship is that an external LOC as a whole might not be positively related to pro-environmental attitudes although certain aspects of it may be. For example, religious beliefs, which are related to an external LOC and at times, teach caring for the environment. This is potentially supported by the finding that LOC was not related to pro-environmental attitudes by itself, but only after controlling for the variables of social desirability, narcissism, altruism, Openness, group membership, area, property damage, and pet ownership. As past research does not tend to control for all these other factors, this might explain why this finding has not been found before. However, replication of this finding is needed, and future research into what aspects of an external LOC might be related to pro-environmental attitudes.

In regards to pro-environmental behaviour not being related to LOC, one possible reason might be that this study's measure of pro-environmental behaviour (donating to charity), might be compatible with both an external and an internal LOC. That is, those with an external LOC might donate to these charities as they are a port of the external forces they

believe can help the environment, whereas those with an internal LOC might simply see donating to environmental charities as a way they can help the environment. Thus both ends of the LOC spectrum might participate in this behaviour equally, potentially explaining why there was no apparent relation between LOC and pro-environmental behaviour. Future studies could examine whether more personal action, unrelated to large organisations, such as car-pooling or recycling are only related to internal LOC, while anything that is related to bigger organisations, such as voting for a pro-environmental government is related to both types of LOC.

This difference in LOC relationship with pro-environmental attitudes and behaviour is interesting as this study suggests that an external LOC is positively related to pro-environmental attitudes but is not related to pro-environmental behaviour. This finding indicates that LOC is related to one's internal attitudes but not related to one's external actions. This suggests some disconnect between pro-environmental attitudes and behaviour, in that individuals who differ in LOC might have differences in pro-environmental attitudes but not behave differently towards the environment. If true, then this points to other internal motives or external forces relating pro-environmental attitudes and behaviour. However, one must keep in mind the potential issues of these relations found in this study as mentioned above.

It was found that Openness was positively related to pro-environmental attitudes, which is in line with past research, but unrelated to donation to environmental charities, this study's measure of pro-environmental behaviour, which is counter to past research (Hirsh, 2010; Hirsh & Dolderman, 2007; Markowitz et al., 2012). In regards to pro-environmental attitudes, Openness was found to be uniquely related to pro-environmental attitudes even after controlling for altruism. This is interesting as past research has suggested that Openness' relation to environmental conservation is due to empathy and altruism (Markowitz et al., 2012). This current research however, suggests that Openness has a positive association with

pro-environmental attitudes outside of simply its relation to altruism and empathy. There are a few potential avenues for Openness' association with pro-environmental attitudes outside of altruism and empathy, when one considers what it means to be high on this personality trait. Those high in Openness are characterised by a willingness to try new things, to be open to new ideas, and to have a general appreciation of adventure, art, aesthetic beauty, and new experiences (Hirsh & Dolderman, 2007; McCrae & Costa, 1987). An aspect of this character that has been linked to environmental attitudes is aesthetic appreciation. Aesthetic appreciation has been shown to shape pro-environmental values (Kellert, 1997). Thus, those who are characterised by a high level of Openness, and subsequently aesthetic appreciation, might push them to participate in and enhance their experience of nature (Hirsh & Dolderman, 2007). This enhanced experience of nature would enhance one's pro-environmental attitudes (Finger, 1994; Hirsh & Dolderman, 2007; Kaplan & Kaplan, 1989).

In regards to pro-environmental behaviour there was no relation with Openness. Since there was no relation between empathy or altruism and pro-environmental behaviour in this study, this might explain why Openness was not related to pro-environmental behaviour. This is because some argue that Openness is only related to environmental engagement because of empathy and altruism (Milfont & Sibley, 2012). Furthermore, one must remember that a broad measure of pro-environmental behaviour was not examined rather donation to an environmental charity was measured. It might be the case that Openness' relation to pro-environmental behaviour might change if other measures of pro-environmental behaviour are used (e.g., recycling, switching off lights).

Openness' difference in relation between pro-environmental attitudes and behaviour is interesting as it suggests that its relationship with pro-environmental attitudes works through a different mechanism, other than empathy and altruism, whereas Openness might only be related to pro-environmental behaviour through these mechanisms of empathy and altruism. Consequently, investigating possible mechanisms for pro-environmental attitudes should be

further examined. It would also be interesting to examine why there are different mechanisms through which Openness is related to pro-environmental attitudes and behaviour. Since, this is the first study, to the researcher's knowledge, that controls for empathy and altruism when examining the Big Five and environmental conservation, replication of these findings is required but these results nevertheless provide novel information on Openness' relation to environmental conservation.

A similar but inversed relationship was found in terms of Agreeableness's relation with pro-environmental attitudes and behaviour. Agreeableness was not related to pro-environmental attitudes, but was negatively related to donating to WWF, this study's measure of pro-environmental behaviour. Neither of these findings are in line with past research that suggests there should be a positive relationship between Agreeableness and pro-environmental attitudes and behaviour (Milfont & Sibley, 2012; Nisbet et al., 2009), although in regards to pro-environmental behaviour, this negative relationship has been reported before (Soliño & Farizo, 2014). One possible explanation for this is that studies reporting a positive relationship tend to examine pro-environmental behaviour independent of other choices, whereas Soliño and Farizo's (2014) measure presented a realistic example that accounted for other choices (e.g., financial costs). Given that the current study's behavioural measure matched more closely to that of Soliño and Farizo, by presenting a range of charities and the option not to donate, this methodological difference might explain why this study's findings are similar to theirs and not others. The negative relationship might be because those high in Agreeableness support human charities over environmental ones, as it is easier to form empathic relationships with humans than the environment. These empathic relationships are what have been suggested as the reason Agreeableness is related to environmental conservation (Milfont & Sibley, 2012). This appears to be supported by a follow up analysis as seen in Appendix I. Thus, this study possibly has greater external validity than past research, as it presents a choice more reflective of real life. The finding that highly agreeable

individuals are more likely to support charities that are related to humans, has implications for environmental charities, in that they should attempt to create an empathic connection with the environment.

In regards to pro-environmental attitudes, it is believed that Agreeableness is related through empathy related elements (Hirsh & Dolderman, 2007; Markowitz et al., 2013). Thus the fact that empathy was not related to pro-environmental attitudes might explain this lack of relationship. Furthermore, the NEP has been criticised as being too cognitive (Hirsh & Dolderman, 2007), which might further explain why Agreeableness was not related, as its emotional factors are said to be what ties it to pro-environmental attitudes (Hirsh & Dolderman, 2007; Markowitz et al., 2013).

Again the difference in Agreeableness' relation to pro-environmental attitudes and behaviour suggests a disconnect between what personality factors are related to one's pro-environmental attitudes and behaviour. It appears that those with different levels of Agreeableness also have differences in donating to environmental organisations, but show no differences in pro-environmental attitudes. This is interesting as it suggests that certain Big Five factors might have an influence on pro-environmental attitudes and not behaviours, whereas others work in the opposite direction. However, this causal relationship cannot be determined due to the correlational nature of this study, although future studies could potentially attempt to examine issues of causality and why certain Big Five traits might influence pro-environmental attitudes and others pro-environmental behaviour.

Past research has suggested that altruism and empathy are positively related to pro-environmental attitudes and behaviour (Kollmuss & Agyeman, 2002; Markowitz et al., 2012; Milfont & Sibley, 2012). However, this past research often looks at empathy and altruism indirectly, through traits such as being pro-social or self-interested (Cameron et al., 1998; Milfont & Sibley, 2012; Schultz, 2001). It has been shown however, that empathy towards nature is significantly related to pro-environmental behaviour (Tam, 2013). This current study

provides a direct examination of these facets, which has been lacking in psychology (Tam, 2013). The current study found that altruism was positively related to pro-environmental attitudes but not related to pro-environmental behaviour (environmental donation), whereas empathy was not found to be related to either pro-environmental attitudes or behaviour. The finding that altruism is positively related to pro-environmental attitudes is in support of past theory. This is not surprising as altruism is benefiting another organism not related to one's self (Trivers, 1971) which could be incorporated within pro-environmental attitudes. The finding in the current study that empathy is not related to pro-environmental attitudes is interesting in light of the fact that altruism was not only significantly related to pro-environmental attitudes but was also the second strongest predictor of it. A possible reason is due to the fact that the NEP is a cognitive measure, which does not look at the emotional side of pro-environmental attitudes (Hirsh & Dolderman, 2007). This lack of focus on emotions could explain why empathy was not related, but altruism was. This is because at times altruism does not require the emotional aspects of empathy, where, for example, evolutionary psychologists suggest that an aspect of altruism involves reciprocal altruism, in which an individual acts altruistically towards others in the hope that others will act altruistically towards them when in need (Trivers, 1971). It is possible that by using a measure that taps into this emotional side of pro-environmental attitudes, one would see a relationship between empathy and pro-environmental attitudes. Unfortunately, due to the problems of reliability with the Kellert measure used in this study (a measure designed to tap into the more emotional side) this aspect could not be examined properly. Due to this and the problems with the NEP, future studies should look at a more reliable measure of Kellert's typologies.

It is interesting however, though that neither altruism nor empathy were related to pro-environmental behaviour as measured in this study. In particular because past research has in fact highlighted the importance of altruism and empathy in the relationship between certain aspects of the Big Five and environmental conservation (Hirsh & Dolderman, 2007;

Markowitz et al., 2012; Milfont & Sibley, 2012). Furthermore, research has shown that individuals who are sympathetic, selfless, and more pro-social tend to show greater pro-environmental behaviour (Allen & Ferrand, 1990; Cameron et al., 1998; Milfont & Sibley, 2012; Schultz, 2001). It is thus unusual that altruism or empathy were not significantly related to pro-environmental behaviour. However, like Agreeableness as mentioned above, these findings usually look at pro-environmental behaviour or engagement in isolation. Like Agreeableness, a potential explanation is that these empathic and altruistic individuals are donating to human charities instead of the wildlife one and/or keeping the money for oneself. This is possible as it would be easier to form an empathic and/or altruistic relationship with a human than with the environment. In fact, further analysis of the data suggests that this was indeed happening for altruism, and although not significant for empathy, was in the expected direction as mentioned above (see Appendix I). However, this study did not examine this further, which future research should. This has potential implications for donation campaigns, in that they need to keep in mind that when there are competing charities, those that are potentially easier to form empathic and/or altruistic bonds with might receive that money.

Lastly, it was predicted that the Dark Triad traits of psychopathy, narcissism, and Machiavellianism would have a negative relationship with pro-environmental attitudes and behaviour. However, the only significant relationship found was that between psychopathy and pro-environmental behaviour.

Higher levels of psychopathy were related to lower levels of money donated to environmental charities, which fits with what one would expect based on the literature (Borden & Francis; Hirsh & Peterson, 2009; Milfont & Sibley, 2012; Paulhus & Williams, 2002). Although not directly tested in other studies, research has demonstrated that individuals who are high on psychopathy tend to show patterns of recklessness, and low levels of empathy and anxiety (Paulhus & Williams, 2002). Research has shown that individuals who are selfish, competitive, and unempathic tend to lack environmental concern

and are less likely to act environmentally (Borden & Francis; Hirsh & Peterson, 2009; Milfont & Sibley, 2012). Inversely, research has also demonstrated that prosocial individuals who are selfless and sympathetic are more environmentally engaged (Cameron et al., 1998; Milfont & Sibley, 2012; Schultz, 2002). Thus this finding is consistent with past research and theory. Although theoretically suggested, no study has tested the Dark Triad's relation to environmental conservation, thus this finding provides some insight into how individuals with psychopathic traits act towards the environment. It suggests that these individuals are of particular risk at behaving anti-environmentally.

On the other hand, neither narcissism nor Machiavellianism were related to pro-environmental behaviour, and psychopathy, narcissism, and Machiavellianism were not related to pro-environmental attitudes in this study. These traits were predicted to be negatively related to pro-environmental attitudes and behaviour due to a lack of empathy. Thus, the finding of this study that empathy was not related to pro-environmental attitudes or behaviour might account for this lack of a relationship between pro-environmental attitudes and behaviours, and these Dark Triad traits. However, why psychopathy and not narcissism or Machiavellianism, was negatively related to pro-environmental behaviour is less clear. One reason might be that only psychopaths engage in animal cruelty (Kavanagh, Signal, & Taylor, 2013). However, animal cruelty is very different to donating to environmental charities. Thus, replication of these findings is needed. Furthermore, it should be examined whether the use of an empathy related measure of pro-environmental attitudes and behaviour does find relationships between the Dark triad and these attitudes and behaviour.

The finding that pro-environmental attitudes, as measured by the NEP, were positively related donation to environmental charities, this study's measure of pro-environmental behaviour, is in line with past literature (Kollmuss & Agyeman, 2002). Many theories of behaviour, such as TPB, VBN, and resource-based explanations, suggest a strong and even at times causal link between attitudes and behaviours (Marquart-Pyatt, 2012). Although research

has shown a disconnect between pro-environmental attitudes and behaviour, the literature has consistently shown a small but positive relationship between the two (Kollmuss & Agyeman, 2002). Furthermore, the disconnect found in some studies has been attributed to a mismatch between attitudes and behaviours studied (St. John et al., 2010). However, this study used a fairly broad measure of pro-environmental attitudes which matches to a wide range of projects performed by pro-environmental charities (measure of pro-environmental behaviour used). Furthermore, the connection between pro-environmental attitudes and behaviour is interesting due to their differences in relation to the personality traits of Openness, Agreeableness, Altruism, LOC, and psychopathy as detailed above. This suggests that the connection between pro-environmental attitudes and behaviour is not through these personality factors as mentioned above. This is interesting as it suggests that the personality traits mentioned above do have a relationship with either pro-environmental attitudes or behaviour, but not both. This thus suggests that pro-environmental attitudes and behaviour have different mechanisms that lie outside of their relation to each other as suggested by past theory (Marquart-Pyatt, 2012).

6.1.3 Non-Significant Predicted Findings

There were a number of other factors that were predicted but not found to be significantly related to pro-environmental attitudes and behaviour. These non-significant findings that were not discussed above will now be discussed.

The finding that none of the Big Five factors other than Openness were related to pro-environmental attitudes, or that none of the Big Five factors other than Agreeableness were related to pro-environmental behaviour is counter to past research (Hirsh, 2010; Hirsh, 2014; Markowitz et al., 2013; Milfont & Sibley, 2012; Soliño & Farizo, 2014). There are a number of possible reasons why these relationships were not found. Firstly, Extraversion, Conscientiousness, and Neuroticism are not consistently found to be related to pro-environmental attitudes or behaviours (Hirsh, 2010; Hirsh, 2014; Hirsh & Dolderman, 2007;

Milfont & Sibley; Soliño & Farizo, 2014). Thus, this study is line with these and potentially demonstrates that there is no relationship between these aspects of the Big Five and environmental conservation. More specifically for Conscientiousness, some argue that certain aspects work in favour of pro-environmental attitudes and behaviours (e.g., repetition of behaviour), while others work against them (e.g., traditionalism; Markowitz et al., 2012). These counter-acting aspects within an individual might explain why Conscientiousness was not found to be related to pro-environmental attitudes or behaviour in this study. However, with regards to pro-environmental behaviour, caution must be applied when attempting to apply these findings to other pro-environmental behaviours. This is because this study looked at only donation to environmental charities as a measure of pro-environmental behaviours. It might be possible that the Big Five is related to other types of pro-environmental behaviour (e.g., supporting sustainable farming).

The lack of a relationship between pro-environmental attitudes, as measured by the BIA, and pro-environmental behaviour goes against past research (Kollmuss & Agyeman, 2002). Interestingly pro-environmental attitudes, as measured by the NEP, were significantly related to pro-environmental behaviour. As Kellert's typologies are a more emotive measure of pro-environmental attitudes (Hirsh & Dolderman, 2007), the fact this study's measure of pro-environmental behaviour was not related to empathy or altruism, might suggest it does not tap the emotive side of environmental conservation. Future research should address this limitation by examining a greater range of pro-environmental behaviours and by using a more reliable measure of Kellert's typologies.

6.1.4 Other Significant Findings

It was found that owning a pet and living in an urban area was related to stronger pro-environmental attitudes. This is in line with past research (Berenguer et al., 2005; Paul & Serpell, 1993). However, neither of these variables were related to donating to an environmental charity, this study's measure of pro-environmental behaviour. This suggests

that these factors are only related to how one views the environment and not to whether one donates to environmental charities, this study's measure of pro-environmental behaviour. It might be that these variables are related to other measures of pro-environmental behaviour, which should be explored in future studies.

Social desirability was found to be related to pro-environmental attitudes and behaviour, but in opposite directions. The positive relationship between pro-environmental behaviour and social desirability is line with past research (Milfont, 2009). The negative relationship between pro-environmental attitudes and social desirability however, is counter to Milfont's study. A possible reason for this difference might be the difference in social desirability scales. This current study used a broad and short measure of social desirability, whereas Milfont used a more targeted version with a wider range of responses. Repetition of this study's findings is needed however, as this negative relationship seems counter to past research and theory (Milfont, 2009).

Lastly, group membership was significantly related to pro-environmental attitudes, in that the online sample had more pro-environmental attitudes than the first year psychology sample. It is known that individuals in different countries have different attitudes towards the environment (Luebke, Clayton, Kelly, & Grajal, 2015; Rauwald & Moore, 2002). As the online sample included participants from various countries, this might explain why there was a difference in pro-environmental attitudes between the two samples.

6.1.5 Other Non-Significant Findings

A number of demographic variables were found to not be significantly related to pro-environmental attitudes and behaviour. Neither property damage nor personal injury was related to pro-environmental attitudes or behaviour, which is counter to past research (Liu et al., 2011). However, this past research looked at attitudes and behaviours towards the species responsible for damage, it is possible that these factors only change attitudes and behaviours towards that one species rather than broadly to the environment or the work done by

environmental charities. Lastly, neither age nor gender were related to pro-environmental attitudes and behaviours which is counter to past research (Dunlap et al., 2000; Hirsh & Dolderman, 2007; Kellert, 1984; Kellert & Berry, 1987; Zhang et al., 2014). However, the inability to replicate these past findings might be due to the small sample size of males (23.6%) and the rage restriction in terms of ages, as most participants were between 17 and 25 (73%). Thus this lack of variation in age and gender might account for why these differences in pro-environmental attitudes and behaviour were not present in this study.

6.1.6 Strengths and Weaknesses

The results of this study provide important insights into what factors are related to pro-environmental attitudes and behaviour. This is important as few studies have been conducted in conservation psychology, and even fewer in how personality variables are related to pro-environmental attitudes and behaviour. Thus, a strength of this study is its examination of a wide range of personality traits, some of which have not been examined before. Furthermore, this study examines both pro-environmental attitudes and behaviour. This allows a comparison between what personality variables are related to pro-environmental attitudes and what are related to pro-environmental behaviours. This is important as past research has shown a disconnect between pro-environmental attitudes and behaviours (Kollmuss & Agyeman, 2002). Lastly, the use of a realistic decision (donating to charities) as a measure of pro-environmental behaviour, potentially allows for greater ecological validity of results, as past studies tend to look at pro-environmental behaviour in isolation of alternative actions.

Despite these strengths there are some aspects that could have impacted the results adversely. Firstly, although diverse, the sample was from predominantly white well-developed nations (US, UK, and Australia) which limits the generalisability of these results to other cultures. Research should be expanded into other countries, such as developing ones in order to see if these findings are consistent across different cultures. Another limitation was the dropping of Kellert's typologies due to reliability issues. This is problematic as Kellert's

typologies complement the NEP to create a better measure of pro-environmental attitudes (Rauwald & Moore, 2002). Lastly, the correlational nature of this study prevents causal claims from being made. Although this is a limitation, this study at least provided some insight in to what personality variables are related and not related to pro-environmental attitudes and behaviour.

Despite these issues this study contributed to the emerging field of conservation psychology, in particular how personality is related to both pro-environmental attitudes and behaviour. It was found that the personality factors of LOC, altruism, and Openness as well as pet ownership, and area lived in were related to pro-environmental attitudes. It was also found that the personality factors of psychopathy and Agreeableness as well as pro-environmental attitudes were related to pro-environmental behaviour.

6.2 Study 2

The aim of Study 2 was to examine the effectiveness of positively vs. negatively imaged advertising campaigns on pro-environmental attitudes and behaviour. In regards to hypotheses, this study examined hypothesis three, four, and five. To make the comparison between attitudes and behaviour more apparent, this discussion will talk about hypothesis three, four, and five together.

6.2.1 Fate of Hypotheses

The hypothesis (three and four) that negatively imaged advertising would have a stronger effect on pro-environmental attitude and behaviour, than positively imaged advertising when there was lower efficacy in the message was not supported. The lack of an interaction between efficacy of message and type of brochure contradicts past research which suggests that negatively framed messages are more effective when efficacy in the presented message is low (Block & Keller, 1995; Meyerowitz & Chaiken, 1987).

One possibility for this null finding is that the research that suggests an interaction is based in the health domain. The health domain focuses on behaviour that directly affects an

individual's health, whereas environmental conservation does not affect an individual's health directly. It is a possibility that when the behaviour does not affect the individual directly this interaction does not occur. In regards to pro-environmental behaviour specifically, the finding that the imagery brochures did not affect pro-environmental behaviour might explain why no interaction occur. Replication of these findings is required to determine whether this difference between conservation and health does exist.

The hypothesis that negatively imaged advertising would have a stronger effect on pro-environmental behaviour than positively imaged advertising when individuals had lower levels of pro-environmental attitudes was not supported. This goes against past research which suggests that a positive comparison (i.e., comparing above average environmentally grown produce to neutrally grown environmental produce) would be more effective for individuals with high environmental concern (Grankvist et al., 2004).

One reason for not replicating this interaction is that, this study used a cognitive measure of pro-environmental attitudes, whereas Grankvist et al. (2004) measured environmental concern, which is emotional in nature. It is possible that without the emotional aspect, this interaction does not occur. Another methodological difference was that Granvkist et al. compared products on how environmental they were, whereas this study examined imagery in isolation. Lastly, this study examined environmental donation behaviour, whereas Grankvist et al. examined purchasing of sustainable products. These differences in methodology might account for the interaction between attitudes and imagery not being replicated in this study. This potentially suggests that this interaction is not robust to changes in methodology.

6.2.2 Significant Findings

Although no interactions were found, there were a number of significant findings. Firstly, brochure imagery influenced pro-environmental attitudes, in that reading a positively imaged brochure increased pro-environmental attitudes compared to negatively and neutrally

imaged brochures. This finding is interesting when one considers the research in the health domain, which tends to show that negatively imaged advertising is the most effective (Witte & Allen, 2000). This demonstrates the importance and necessity for research into the effects of advertising in an environmental domain, as research from other areas might not be applicable to this domain. This study suggests adverts with negative images may not influence pro-environmental attitudes. If this finding is replicated in other studies, this would suggest that environmental campaigns might be producing ineffective adverts when using negative images as they do not influence pro-environmental attitudes. Instead these campaigns should be reframed to show the positives of the environment in order to be more effect. This research demonstrates that even slight changes in imagery can have a significant impact on individuals' pro-environmental attitudes. Replication of these findings is needed; however, this research has demonstrated the influence of imagery on pro-environmental attitudes.

In contrast, imagery had no effect on one's donation to environmental charities, this study's measure of pro-environmental behaviour, which is counter to past research (Block & Keller, 1995; Maheswaran & Meyers-Levy, 1990; Meyerowitz & Chaiken, 1987). One possible reason for this difference is that imagery might not have a direct effect on pro-environmental behaviour, but an indirect one through pro-environmental attitudes. Although this indirect relationship was not tested, this study does show that imagery affects pro-environmental attitudes, and that there is positive relationship between pro-environmental attitudes and behaviour. Thus, it is possible that this indirect effect might be occurring. Another possibility is that these previous studies looked at message framing in terms of words not images, whereas this study looked at differences in images not words. This difference in framing might account for why imagery did not affect pro-environmental behaviour, as different images might not be enough to influence behavioural change only changes in attitudes. Future studies should examine whether this indirect relationships is indeed occurring. Furthermore, as previous studies change the framing in regards to words, it would

be interesting to see if differences in wording have a similar impact on pro-environmental behaviour and attitudes as differences in imagery.

In regards to personality, only Openness and Neuroticism were related to pro-environmental attitudes and behaviour. As in Study 1, Openness was found to be significantly related to pro-environmental attitudes and not related to pro-environmental behaviour. Those higher in Openness were found to have more pro-environmental attitudes, which is in line with past research (Hirsh & Dolderman, 2007). This is interesting as neither empathy nor altruism were significantly related to pro-environmental attitudes in this study, which have been suggested as the mechanisms for Openness' relation to pro-environmental attitudes (Milfont & Sibley, 2012). Like Study 1, this suggests that Openness has a relation to pro-environmental attitudes over and above its connection through empathy and altruism. In regards to pro-environmental behaviour, like Study 1, its non-significant relation might be because there was no relation between empathy or altruism and pro-environmental behaviour. This is because some argue that Openness is only related to environmental engagement because of empathy and altruism (Milfont & Sibley, 2012). Furthermore, our measure of pro-environmental behaviour, donating to charities, might not be related to Openness whereas other behaviours, such as supporting 'green' policies might be.

The continued difference in Openness' relation with pro-environmental attitudes and behaviour, suggests a number of things. Firstly, it suggests that this difference is fairly robust at least in regards to these measures of pro-environmental attitudes and behaviour. This consistency provides some evidence that Openness' relationship with pro-environmental attitudes works through mechanisms outside of just empathy and altruism. In contrast, without these empathic and altruistic mechanisms, Openness has no relation to pro-environmental behaviour. As Openness varies by culture (McCrae & Terracciano, 2005), it would be interesting to examine whether this variation in Openness accounts for country differences in pro-environmental attitudes found in some studies (Franzen, 2003; Rauwald & Moore, 2002).

In contrast, Neuroticism was significantly related to donating to environmental charities, this study's measure of pro-environmental behaviour, but not pro-environmental attitudes. Those higher in Neuroticism donated less to the environmental charity, which is in line with past research (Markowitz et al., 2013; Soliño & Farizo, 2014). However, some studies find that Neuroticism is positively linked to environmental engagement (Milfont & Sibley, 2012). Although Milfont and Sibley (2012) note that Neuroticism is inconsistently found to be related to environmental engagement, even within their own study. This inconsistently in Neuroticism's relationship with pro-environmental behaviour possibly suggests a situational influence on highly Neurotic individuals that at times makes these individuals act pro-environmentally and other times anti-environmentally. If this is the case it suggests that pro-environmental behaviour is not merely the case of personality or situationally related, but that there might be an interaction between personality and situation. This has implications for how conservation psychology is conducted, in that research into these factors cannot be conducted in isolation, and that research should take into consideration both situational and personality factors to create a better understanding of what makes an individual act or not act environmentally.

In contrast, Neuroticism was not related to pro-environmental attitudes, like Study 1. It is interesting that what factors of the Big Five are related to pro-environmental attitudes are more consistent than what factors are related to pro-environmental behaviour, at least for these measures. This possibly suggests that this study's measure of pro-environmental attitudes might be more consistent across situations, whereas this study's measure of pro-environmental behaviour is more likely to be influenced by the situation. Further research is needed to determine whether this is indeed the case, and if so why.

Unlike Study 1, gender was found to be significantly related to pro-environmental attitudes, in that females had more pro-environmental attitudes than males, which is in line with past research (Hirsh, 2010; Hirsh & Dolderman, 2007; Zelezny et al., 2000). This is

interesting as the gender split in Study 2 was similar to Study 1. A possible reason for this, is that when there is a very uneven gender split in the sample, as was the case for Study 1 and 2, the difference between the genders in regards to pro-environmental attitudes is harder to find. Another reason might be the fact that Study 1 and Study 2 had different populations, with Study 2 only examining first year undergraduate psychology students. In contrast to past research, but in line with Study 1, gender was not found to be related to pro-environmental behaviour. This suggests that although there might be differences in pro-environmental attitudes between the genders, when it comes to pro-environmental behaviour, in particular donation habits, there are no differences in pro-environmental behaviour. This is counter to past research (Zelezny et al., 2000). This potentially suggests that other factors interacted with gender to result in similar pro-environmental behaviours, despite the difference in pro-environmental attitudes.

Lastly, like Study 1, pro-environmental attitudes were significantly related to pro-environmental behaviour, which is in line with past research (Kollmuss & Agyeman, 2002). Again, this makes sense in light of theories of behaviour, such as TPB, VBN, and resource-based explanations, which suggest a link strong link between attitudes and behaviours (Marquart-Pyatt, 2012). This continued relationship between pro-environmental attitudes and behaviour, adds to the robustness of this relationship. Although this might seem like an obvious relationship, one must keep in mind that within environmental conservation there is normally quite a large disconnect between the two (St. John et al., 2010). Thus, this continued relationship further cements some connection between pro-environmental attitudes and behaviour.

6.2.3 Non-Significant Findings

Many personality traits were not found to be significantly related to pro-environmental attitudes and behaviour, including LOC, empathy, altruism, and most of the Big Five. In regards to LOC, it had no relationship to either pro-environmental attitudes or behaviour

which is counter to past research (Barney et al., 2005; Kollmuss & Agyeman, 2002). This non-existent relationship with pro-environmental behaviour is consistent with Study 1, however, this non-existent relationship with pro-environmental attitudes is counter to Study 1. One potential reason for this discrepancy, in regards to pro-environmental attitude, is that the majority of individuals in this study had an internal LOC (71.8%) and thus an external LOC was not well represented in this sample. This range restriction might also explain why pro-environmental behaviour was not related to an internal LOC, as suggested in past research (Barney et al., 2005; Kollmuss & Agyeman, 200). However, as mentioned previously future studies should examine a wider range of pro-environmental behaviours, and whether different pro-environmental behaviours are related differently to LOC.

Empathy and Altruism were not related to pro-environmental attitudes or behaviours in this second study, which is counter to past research and theory (Kollmuss & Agyeman, 2002; Markowitz et al., 2012; Milfont & Sibley, 2012). This null relationship with pro-environmental attitudes and behaviour is in line with Study 1, except that Study 1 found a positive relationship between altruism and pro-environmental attitudes. A possible reason for the null relationship between empathy, altruism, and pro-environmental attitudes is that the NEP is too cognitive and does not examine the emotional aspects of pro-environmental attitudes (Hirsh & Dolderman, 2007). The consistent lack of a relationship between empathy and pro-environmental attitudes demonstrates the robustness of this null relationship, when using the NEP as a measure of pro-environmental attitudes. The difference in results regarding Altruism between Study 1 and Study 2 suggests that the relationship between altruism and pro-environmental attitudes is not very robust. Replication of these findings, in particular the robustness of empathy and altruism's relationship with pro-environmental attitudes across cognitive (NEP) and emotive (Kellert's typologies) measures is needed.

In regards to neither's relationship with pro-environmental behaviour, this is consistent with Study 1. A potential explanation for this was mentioned in Study 1, in that

past research generally looks at pro-environmental behaviour or engagement in isolation, whereas in the real world there are competing demands. It is possible that individuals who are high in empathy and altruism are donating more to the human focused charities (OXFAM and BasicNeeds), as it would reasonable be easier to form empathic or altruistic connections with humans than with the environment. The consistency of this null relationship adds to the robustness of empathy and altruism's null relationship with this measure of pro-environmental behaviour. Replication of these findings, across various pro-environmental behaviours is required to further the generalisability of results.

Conscientiousness, Extraversion, and Agreeableness were not related to pro-environmental attitudes and behaviour, which is counter to past research (Hirsh, 2010; Hirsh, 2014; Markowitz et al., 2013; Milfont & Sibley, 2012; Soliño & Farizo, 2014). These relationships were consistent with Study 1 in terms of pro-environmental attitude. However, in regards to pro-environmental behaviour the relationship is less consistent as it was found that Agreeableness instead of Neuroticism had a significant relationship with pro-environmental behaviour in Study 1. This inconsistency with pro-environmental behaviour and Agreeableness suggests that Agreeableness might not be robustly related to this study's measure of pro-environmental behaviour and that situational or other factors might influence its relationship with pro-environmental behaviour. This provides support to the notion that when it comes to pro-environmental behaviour, in particular donating to charities, other factors, such as situation, might have some influence on the Big Five's relation to pro-environmental behaviour. In regards to pro-environmental attitudes, it is believed that Agreeableness is related to these attitudes through empathy and altruism (Hirsh & Dolderman, 2007; Markowitz et al., 2013). Thus, the finding in this study that neither empathy nor altruism were related to pro-environmental attitudes, might explain Agreeableness lack of a relationship with pro-environmental attitudes.

In regards to Extraversion and Conscientiousness, these factors are not consistently found to be related to pro-environmental attitudes or behaviour (Hirsh, 2010; Hirsh, 2014; Hirsh & Dolderman, 2007; Milfont & Sibley; Soliño & Farizo, 2014). This might explain why Extraversion and Conscientiousness were not related to both pro-environmental attitudes and behaviour in this study. More specifically for Conscientiousness, some argue that certain aspects work in favour of pro-environmental attitudes and behaviours (e.g., repetition of behaviour), while others work against them (e.g., traditionalism; Markowitz et al., 2012). These counter-acting aspects within an individual might explain why Conscientiousness was not found to be related to pro-environmental attitudes or behaviour in this study. This consistency of there being no relationship between Extraversion and Conscientiousness to both pro-environmental attitudes and behaviour, suggests there is some robustness to these null relations. This is in line with research that tends to show that it is instead Openness and Agreeableness that are the most consistently related Big Five Factors (Hirsh, 2014). However, as some studies do find relations between these Big Five factors and pro-environmental attitudes and behaviour (Hirsh, 2014; Hirsh & Dolderman, 2007; Markowitz et al., 2012; Milfont & Sibley, 2012), it would be interesting to examine a wider range of pro-environmental attitudes and behaviours as it might be that the Big Five traits are related to more emotive aspects of pro-environmental attitudes and behaviours. It would also be interesting to examine how various pro-environmental behaviours such as high effort vs. low effort, or low cost vs. high cost environmental behaviours are related to the Big Five.

As with Study 1, age was not significantly related to pro-environmental attitudes or behaviour, which is counter to past research (Dunlap et al., 2000; Hirsh, 2010; Kellert, 1984). Again, as in Study 1, this null relationship is likely due to the range restriction of ages as most participants were between 17 and 22 (83.1%). Thus, this range restriction might have prevented any real examination of differences in pro-environmental attitudes and behaviour between ages.

Lastly, it was found that the efficacy of Save the Planet was not related to pro-environmental attitudes or behaviour. One possibility for this lack of a relationship with pro-environmental attitudes is that the efficacy of a single charity is not related to general pro-environmental attitudes. In regards to pro-environmental behaviour though, one would expect the efficacy of a charity to influence whether one donated to it or not. The lack of variation in efficacy of Save the Planet might explain why this relationship was not significant. However, even with this lack of variation, this lack of a relationship between Save the Planet's efficacy and pro-environmental behaviours was only borderline non-significant. Thus, future studies should address this lack of variation, and examine whether efficacy of a charity is related to one's willingness to donate to it.

6.2.4 Strengths and Weaknesses

A number of factors could have inversely impacted the findings of Study 2. Firstly, the sample was fairly homogenous, as all participants were first year psychology students. This potentially limits the generalisability of Study 2's findings. Replication of these findings across various samples is needed. As this study required participants to read the brochure, this study was unable to examine what facets of an advert attract individuals to engage with it in the first place. Thus, future research is required to determine what types of imagery draw individuals to attend to the advert in the first place. Lastly, this study was cross-sectional, and subsequently the long-term effects of brochure imagery are uncertain. This could be addressed with the use of a longitudinal design in future research.

Despite these limitations, this study was the first experiment that examined the effects of differently imaged adverts on individuals' pro-environmental attitudes and behaviours. Consequently, the novelty of this study is one of its greatest strengths, as this area is understudied within conservation psychology. Furthermore, this study demonstrated the robustness of certain personality factors' relationships with pro-environmental attitudes and behaviour (e.g., Openness and pro-environmental attitudes). Another strength of this study

was the brochures and donation measure used in this study. As they were contextualised in a real world example (adverts for a charity, and the decision to donate), the findings of this study potentially have greater ecological validity. Lastly, the experimental nature of this study enables causal claims to be made about how imagery used in brochures effects pro-environmental attitudes and behaviour.

7. Conclusion

Study 1 and Study 2 examined personality's relationship to conservation attitudes and behaviour, adding to the relatively new field of conservation psychology. Furthermore, Study 2 examined how the imagery used in environmental adverts affects individuals' pro-environmental attitudes and behaviour. Results suggest that a number of personality traits are related to pro-environmental attitudes and behaviour. Study 1 demonstrated a relationship between pro-environmental attitudes and altruism, Openness, and LOC; while Study 2 continued to show that Openness was positively associated with pro-environmental attitudes. In regards to pro-environmental behaviour, Study 1 demonstrated that pro-environmental attitudes were positively related to pro-environmental behaviours, whereas psychopathy and Agreeableness were negatively related. Study 2 continued to show pro-environmental attitudes positive relationship with pro-environmental behaviour, but also showed Neuroticism's negative relationship with pro-environmental behaviour. Furthermore, Study 2 demonstrated that positive imagery in brochures influenced individuals to have stronger pro-environmental attitudes but did not influence individuals' pro-environmental behaviour. This provides implications for environmental organisations on the type of imagery they should use in their adverts to increase pro-environmental attitudes.

As previously mentioned, further studies are needed to build upon the findings of this thesis, as well as address its potential limitations. In regards to Study 1, this could be done by examining a more varied measure of pro-environmental attitudes that addresses the emotional aspects of pro-environmental attitudes. Furthermore, a wider range of pro-environmental

behaviours should be examined, as this study simply looked at charity donation. In regards to Study 2, future studies should also examine a wider range of pro-environmental behaviours as well as including a measure of pro-environmental attitudes that examine emotive aspects of pro-environmental attitudes. Furthermore, future studies would benefit from the manipulation of other aspects of brochures (e.g., the wording) as well as examining what factors initially attract individuals to the advert. Doing so will further explore the effects of environmental adverts on individuals' pro-environmental attitudes and behaviour.

This thesis has built upon previous research, extending the knowledge of an under researched but vitally important field of research, conservation psychology. Although replication of this thesis' findings is required, this thesis has demonstrated a relationship between personality factors and pro-environmental attitudes and behaviour, as well as the influence of imagery on these pro-environmental attitudes and behaviour.

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Appendix A
Participants' Nationality Breakdown for Study 1

Participant breakdown by nationality is presented in Table A1.

Table A1

Participant Breakdown by Nationality

Country	Number of participants	Percentage of total (%)
Australia	149	62.9
Bahamas	1	0.4
Brazil	1	0.4
Canada	7	3.0
Chile	1	0.4
Denmark	1	0.4
Estonia	1	0.4
France	1	0.4
Germany	2	0.8
India	2	0.8
Ireland	1	0.4
Italy	1	0.4
South Korea	1	0.4
Lithuania	1	0.4
Malaysia	1	0.4
New Zealand	1	0.4
Peru	1	0.4
The Philippines	1	0.4
Romania	1	0.4

Appendix A (cont.)

Russia	1	0.4
South Africa	3	1.3
Spain	1	0.4
Sweden	1	0.4
Thailand	1	0.4
United Arab Emirates	1	0.4
United Kingdom	11	4.6
United States of America	43	18.1

Appendix B
Online Survey for Study 1

Q1 Please create a unique identifier in case we need to find your data

___

Q2 How old are you? (please enter numerically)

___

Q3 What gender do you identify as?
Male, Female, Other

Q4 What country do you currently reside in?
(drop down menu of 196 countries)

Q5 What is your religious affiliation? (e.g., Islam, Christianity, Judaism, Hindu, Agnostic, Atheist/no-religion, etc.)

___

Q6 What would you consider your cultural background to be?

___

Q7 What would you classify the area you are living in?
Rural, Urban

Q8 What is the highest level of education you have achieved; if currently enrolled, highest degree achieved.
Some high school/secondary education, Completed high school/secondary education, Tafe, Trade/technical/vocational training, Diploma, Associate degree, Bachelor's degree, Honours/postgraduate degree, Master's degree, Doctorate degree/PhD

Q9 Have you or anyone close to you ever been seriously injured by an animal?
Yes, no

Q10 Have you or anyone close to you ever suffered serious property damage due to an animal?
Yes, no

Q11 Do you own any pets?
Yes, no

Q11a How many pets do you own? (please enter numerically)

___

Q12 Please answer either True or False to the following questions, please answer these without outside aid.

Appendix B (cont.)

Spiders have 10 legs
Female peacocks are brightly coloured
All spiders are poisonous to humans
Reptiles are cold blooded
Veal comes from lamb
All birds fly south for the winter
Tigers are an endangered animal
Whales can breathe underwater
Koala bears are not really bears
Some mammals lay eggs
Penguins are birds
Baby birds drink milk
When frightened an ostrich will bury its head in the sand
All mammals are warm blooded
Sharks can only live in salt water

Q13 Below are a number of statements, please rate on the scale below how much you agree or disagree with each one in reference to yourself.

1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree

Feel others' emotions
Suffers from others' sorrows
Am deeply moved by others' misfortunes
Don't understand people who get emotional
Am easily moved to tears
Cry easily
Am not interested in other people's problems
Seldom get emotional
Experience my emotions intensely
Feel spiritually connected to other people

Q14 Please answer the following statements about how true they are of you right now, not how you wish to be.

1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree

Make people feel welcome
Look down on others
Anticipate the needs of others
Am indifferent to the feelings of others
Love to help others
Am concerned about others
Make people feel uncomfortable
Turn my back on others
Take no time for others
Have a good work for everyone

Appendix B (cont.)

Q15 Below are a number of statements about how various topics affect your personal beliefs. There are no right or wrong answers. Using the 6-point scale shown below, please indicate how much you agree or disagree with each item.
1= strongly disagree, 2= generally disagree, 3= somewhat disagree, 4= somewhat agree, 5= generally agree, 6= strongly agree

I can anticipate difficulties and take action to avoid them
A great deal of what happens to me is probably just a matter of luck
Everyone knows that luck or chance determines one's future
I can control my problems only if I have outside support
When I make plans, I am almost certain I can make them work
My problem(s) will dominate me all my life
My mistakes and problems are my responsibility to deal with
Becoming a success is a matter of hard work, luck has little or nothing to do with it
My life is controlled by outside actions and events
People are victims of circumstances beyond their control
To continually manage my problems I need professional help
I believe a person can truly be the master of their fate
I am confident of being able to deal successfully with future problems
Maintain control over my problem(s) is due mostly to luck

Q16 Please respond with either True (T) or False (F) to each item. When completing the questions, please be as honest and accurate as you can, bearing in mind that your results are anonymous.

It is sometimes hard for me to go on with my work if I am not encouraged
I sometimes feel resentful when I don't get my way
On a few occasions I have given up doing something because I thought too little of my ability
There have been times when I felt like rebelling against people in authority even though I knew they were right
No matter who I am talking to, I am always a good listener
There have been occasions when I took advantage of someone
I am always willing to admit when I have made a mistake
I sometimes try to get even rather than to forgive and forget
I am always courteous, even to people who are disagreeable
I have never been annoyed when people express ideas very different from my own
There have been times when I was quite jealous of the good fortune of others
I am sometimes irritated by people who ask favours of me
I have never deliberately said something that hurts someone's feeling

Q17 For the below 50 questions please indicate on the scale how true they are of yourself.

1= inaccurate, 2=moderately inaccurate, 3=neither accurate or inaccurate, 4= moderately accurate, 5= accurate

Have a vivid imagination

Believe in the importance of art

Appendix B (cont.)

Seldom feel blue

Have a sharp tongue

Am not interested in abstract ideas

Find it difficult to get down to work

Panic easily

Tend to vote for conservative political candidates

Am not easily bothered by things

Make friends easily

Often feel blue

Get chores done right away

Suspect hidden motives in others

Rarely get irritated

Do not like art

Dislike myself

Keep in the background

Do just enough work to get by

Am always prepared

Tend to vote for liberal political candidates

Feel comfortable with myself

Avoid philosophical discussions

Waste my time

Believe that others have good intentions

Am very pleased with myself

Have little to say

Feel comfortable around other people

Am often down in the dumps

Appendix B (cont.)

Do not enjoy going to art museums

Have frequent mood swings

Don't like to draw attention to myself

Insult people

Have a good word for everyone

Get back at others

Carry out my plans

Would describe my experiences as somewhat dull

Carry the conversation to a higher level

Don't see things through

Am skilled in handling social situations

Respect others

Pay attention to details

Am the life of the party

Enjoy hearing new ideas

Accept people as they are

Don't talk a lot

Cut others to pieces

Make plans and stick to them

Know how to captivate people

Make people feel at ease

Shirk my duties

Q18 Please answer the following statements about yourself truthfully on the following scale.

1= disagree strongly, 2= generally disagree, 3= disagree moderately, 4= disagree slightly, 5= neither agree or disagree, 6= agree slightly, 7= agree moderately, 8= generally agree, 9= agree strongly

I tend to manipulate others to get my way

Appendix B (cont.)

I have used deceit or lied to get my way
I have used flattery to get my way
I tend to exploit others towards my own end
I tend to lack remorse
I tend to not be too concerned with morality or the morality of my actions
I tend to be callous or insensitive
I tend to be cynical
I tend to want others to admire me
I tend to want others to pay attention to me
I tend to seek prestige or status
I tend to expect special favours from others

Q19 Please select the option that indicates how much you agree or disagree with each of the following statements.

1= strongly disagree, 2= moderately disagree, 3= slightly disagree, 4= neither agree nor disagree, 5= slightly agree, 6= moderately agree, 7= strongly agree

Humans are severely abusing the environment
If things continue on their present course, we will soon experience a major ecological catastrophe
The balance of nature is delicate and easily upset
The so-called "ecological crisis" facing humankind has been greatly exaggerated
We are approaching the limit of the number of people that the Earth can support
When humans interfere with nature, it often produces disastrous consequences
Human ingenuity will insure we do not make the Earth unliveable
Humans have the right to modify the natural environment to suit their needs
Humans were meant to rule over nature
Humans will eventually learn enough about how nature works to be able to control it
Despite our special abilities, humans are still subject to the laws of nature
The Earth has plenty of natural resources if we just learn how to develop them
Plants and animals have as much right as humans to exist
The balance of nature is strong enough to cope with the impacts of modern industrial nations
The Earth is like a spaceship with very limited room for resources

Q20 Please select the option that indicate how much you agree or disagree with each of the following statements.

1= strongly disagree, 2=slightly disagree, 3= neutral, 4= slightly agree, 5= strongly agree

I like to watch animals perform or do tricks
Even insects are important to nature
I like animals I can hold and hug
People should not hurt animals
I like to go where animals live in the world
We should get rid of all poisonous animals like snakes and scorpions
I like learning about the parts of plants and animals
I like useful animals, such as horses, police dogs, and seeing-eye dogs
All dogs should be well trained

Appendix B (cont.)

It is okay for animals to eat each other to survive
A good animal is always happy to see its owner
At zoos, you should not see the animals unless they want you to
A good animal has no owner and lives in the wild
I like the sounds of wind and rain
I like learning the names of plants and animals
The best plants and animals are those that people can eat or make into other things
All dogs should be kept on a leash
I like learning about how animals and plants help one another survive
I like to see my pet happy
Plants and animals deserve our protection
I like the sounds animals make
I don't like getting dirty when I go outside
I think insects are fascinating
It's okay to hunt animals for food
A good animal obeys its owners
All plants and animals are important in nature
Pets should be part of the family
I admire people who protect plants and animals
I like the smell of plants and animals in the wild
It's usually too hot or too cold to enjoy being outdoors
I like watching nature shows on television
Plants and animals are around for people to use
Wild animals should be captured and tamed
I like learning about how animals behave in the wild
Animals' feelings are as important as mine
Human land developers ought to do everything possible to avoid removing vegetation and dislocating animals
I like the feel of grass and sand under my bare feet
We should get rid of insects as much as we can
Nature is good because it gives us many things we need
I like to swim in lakes, rivers, and oceans
I admire people like lion tamers and dogcatchers, who know how to catch and control animals
Zoos should show you animals that are cute and friendly
I am really bothered by the sight of weeds in a lawn
Insects that will bite or sting me are everywhere in nature
I like to help sick or hurt animals
I like the sound of rivers, streams, and waves
Animals in the wild are dangerous
I think it is cruel to keep birds, even parakeets and canaries, in cages

Q21 You will be presented three different charities, please read each one and answer the following question in regards to the information presented.

Oxfam

Oxfam understands that many causes of poverty are linked, and uses many tactics to fight poverty and inequality. From local communities to the global stage, they call for fairness and justice so that people in poverty can influence the decisions that affect them. Oxfam believes

Appendix B (cont.)

that all people are entitled to decent work, income security, essential health services, education, gender equality, security from conflict and disaster.

WWF

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature. WWF aims to accomplish this by conserving the world's biodiversity, ensuring that the use of renewable natural resources is sustainable and by promoting the reduction of pollution and wasteful consumption.

BasicNeeds

BasicNeeds believes that mental health is a right, not a privilege. For millions of mentally ill people around the world, this is not the case. For them, mental illness is a world of poverty, stigma, and isolation. BasicNeeds transforms lives by working with mentally ill people so that together, we can build a world where people with mental illness feel proud to live in.

Imagine you had $100 spare cash, consider the four options below, how would you split the money?

Oxfam
WWF
BasicNeeds
To spend on yourself

Q22 If you wish could you justify your donation split (optional)

___

Q23 Where did you hear about this survey from?

___

Q24 Did you have any comments about the survey? (leave blank if none)

___

Thank you for participating in this study, your time and help is greatly appreciated.

If you know someone who might also be interested please forward them this link: https://mqedu.qualtrics.com/SE/?SID=SV_2mbQeJk6qlruaLr

Please do not hesitate contacting me if you have any questions.
Alistair Soutter (Alistair.Soutter@students.mq.edu.au)

Appendix C
Donation Scale Descriptions

Oxfam

Oxfam understands that many causes of poverty are linked, and uses many tactics to fight poverty and inequality. From local communities to the global stage, they call for fairness and justice so that people in poverty can influence the decisions that affect them. Oxfam believes that all people are entitled to decent work, income security, essential health services, education, gender equality, security from conflict and disaster.

WWF

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature. WWF aims to accomplish this by conserving the world's biodiversity, ensuring that the use of renewable natural resources is sustainable and by promoting the reduction of pollution and wasteful consumption.

BasicNeeds

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Appendix D
Online Advertisement (First-Year Psychology Student Pool): Study 1

A study on personality and environmental conservation

This study is examining the relationship between personality factors and environmental conservation. Participation includes an online survey that can be completed at home in your free time, which will take 15-20 minutes to complete. If you have any questions please feel free to email me at Alistair.Soutter@students.mq.edu.au.

Appendix E
Online Advertisement (General Public): Study 1

Online forum advert

Hi everyone, I'm currently undertaking a masters of research (psychology). For my thesis I am studying the relationship between personality and environmental conservation attitudes. It'd be really great if you could help me out by completing my survey, it should only take 15-25 minutes. I really appreciate the help! All you need to be is over the age of 18.

If you know anyone else who would be interested and able to help me, please forward them the link. Thank you very much!

https://mqedu.qualtrics.com/SE/?SID=SV_2mbQeJk6qlruaLr

If you have any questions my email is on the survey, or you can post here and I'll try my best to answer thanks!

Facebook group advert

Researchers from Macquarie University invite you to participate in a short survey on personality and environmental conservation. This survey will take roughly 20-30 minutes, and will greatly help in our research. Participation is open to all those aged 18+ .Please click on the following link to our study

https://mqedu.qualtrics.com/SE/?SID=SV_2mbQeJk6qlruaLr

Appendix F
Information and Consent Form for Study 1

Department of Psychology
Faculty of Human Sciences
MACQUARIE UNIVERSITY NSW 2109
Phone: +61 (0)2 9850 9898
Fax: +61 (0)2 9850 9912
Email: psy_off@ mq.edu.au
Chief Investigator's / Supervisor's Name: Simon Boag
Chief Investigator's / Supervisor's Title: Dr
Co-Investigator: Mr Alistair Soutter
Participant Information and Consent Form

Name of Project: The personality of environmental conservation

You are invited to participate in a study examining how personality factors are related to environmental conservation. The purpose of this study is to examine how various personality constructs are related to environmental conservational attitudes, as well as how they interact with each other.

The study is being conducted by Alistair Soutter and he can be contacted at Alistair.Soutter@students.mq.edu.au. This research is being conducted to meet the requirements of Masters of Research (Psychology) under the supervision of Simong Boag, phone number: +61 (0)2 9850 8024, email: Simon.Boag@mq.edu.au of the Department of Psychology.

If you decide to participate, you will be asked to complete a series of questionnaires online, which should take roughly 15-20 minutes. Responses to the questions will be recorded and analysed, however no data will be collected that will allow identification of participants. There should not be any risks or discomforts involved, if you feel that any questions are difficult to answer, we ask that you do not participate further as we do not wish to cause any harm. For those participating as part of a first year psychology requirement at Macquarie University, course credit will be awarded for 20 minutes participation.

Any information or personal details gathered in the course of the study are confidential, except as required by law. No individual will be identified in any publication of the results. Raw data will be strictly confidential and only available to Mr. Alistair Soutter and Dr. Simon Boag. A summary of the results of the data can be made available to you on request by emailing Alistair Soutter at Alistair.Soutter@students.mq.edu.au.

Participation in this study is entirely voluntary: you are not obliged to participate and if you decide to participate, you are free to withdraw at any time without having to give a reason and without consequence. For Macquarie University first year Psychology students intending to receive course credit withdrawal will not disqualify you from receiving course credit.

This is an online study. You are under no obligation to participate and will not be given the study URL until you have signed up for the study. In order to sign up for the study, you must

Appendix F (cont.)

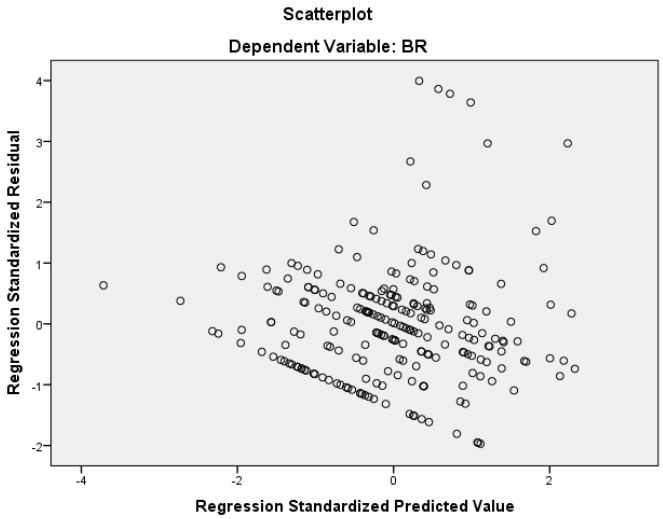
agree to the terms of participation noted in the information and consent form. This includes not receiving credit for participation until the end of the survey. You are free to stop the survey at any stage; but, you will not receive credit for participating unless you complete the entire survey. As a participant, you are obligated to answer all questions accurately and honestly. Answering fictitiously or haphazardly jeopardises the quality of the research.

As a research participant you are responsible for:
- Completely reading information and consent forms
- Carefully weighing the risks and benefits of participation
- Knowing when, where, and for how long participation is required
- Talking to the researcher when concerns arise
- Fulfilling the responsibilities as described in the information and consent forms

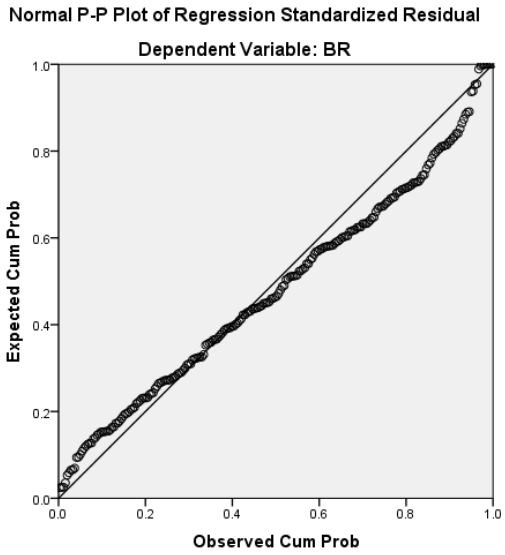
Note: The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (telephone (02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

Appendix G
Violated Assumptions for Study 1

Violation of homoscedacity.



Violation of normality.



Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.091	232	.000	.913	232	.000

a. Lilliefors Significance Correction

Appendix H
Correlation Matrix of Variables from Study 1

Correlations

		AET	Empathy	Altruism	LOC	SDT	NEP	Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism	Psychopathy	Narcissism	Machiavellianism	Dominionism	Ecologocial_Scientism	Humanism	Moralism	Naturalism	Negativism	Utilitarianism	Oxfam	WWF	BasicNeeds	Keep_self
AET	Pearson Correlation	1	-.077	.080	-.067	-.112	.219**	.299**	-.028	-.021	.106	-.014	.029	-.074	-.066	-.143*	.403**	-.057	.152*	.207**	-.205**	.108	-.081	.047	.009	.009
	Sig. (2-tailed)		.240	.219	.304	.086	.001	.000	.664	.752	.103	.828	.657	.254	.313	.028	.000	.379	.019	.001	.002	.093	.216	.476	.891	.889
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Empathy	Pearson Correlation	-.077	1	.533**	-.014	.106	.183**	.197**	.206**	.162*	.343**	.202**	-.477**	.026	-.258**	-.153*	.112	.251**	.228**	.256**	-.078	-.156*	.045	.087	.055	-.135*
	Sig. (2-tailed)	.240		.000	.830	.103	.005	.002	.001	.013	.000	.002	.000	.686	.000	.019	.086	.000	.000	.000	.234	.017	.497	.187	.400	.040
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Altruism	Pearson Correlation	.080	.533**	1	-.343**	.407**	.166*	.242**	.408**	.437**	.666**	-.332**	-.644**	-.214**	-.462**	-.150*	.193**	.184**	.253**	.330**	-.219**	-.021	.169**	.127	.059	-.253**
	Sig. (2-tailed)	.219	.000		.000	.000	.***	.000	.000	.000	.000	.000	.000	.001	.000	.021	.003	.004	.000	.000	.001	.745	.010	.053	.367	.000
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
LOC	Pearson Correlation	-.067	-.014	-.343**	1	-.195**	.047	-.088	-.493**	-.345**	-.295**	.465**	.276**	.141*	.226**	.103	-.221**	-.007	-.123	-.279**	.336**	.012	-.115	-.030	-.001	.071
	Sig. (2-tailed)	.304	.830	.000		.003	.475	.175	.000	.000	.000	.000	.000	.030	.000	.114	.001	.918	.059	.000	.000	.858	.080	.644	.990	.283
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
SDT	Pearson Correlation	-.112	.106	.407**	-.195**	1	-.071	.106	.401**	.249**	.488**	-.404**	-.344**	-.387**	-.514**	-.041	.087	.092	.045	.060	-.155*	-.047	.112	.131*	.088	-.236**
	Sig. (2-tailed)	.086	.103	.000	.003		.277	.103	.000	.000	.000	.000	.000	.000	.000	.533	.184	.159	.487	.356	.017	.476	.088	.045	.179	.000
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
NEP	Pearson Correlation	.219**	.183**	.166*	.047	-.071	1	.327**	.027	.023	.090	.078	-.126	-.097	-.124	-.368**	.399**	.235**	.588**	.401**	-.296**	-.285**	-.111	.376**	-.003	-.178**
	Sig. (2-tailed)	.001	.005	.011	.475	.277		.000	.679	.729	.171	.234	.054	.137	.057	.000	.000	.000	.000	.000	.000	.000	.091	.000	.962	.007
	N	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	233	232	234	231
Openness	Pearson Correlation	.299**	.197**	.242**	-.088	.106	.327**	1	.046	.184**	.215**	-.037	-.028	-.047	-.150*	-.193**	.342**	.119	.326**	.244**	-.189**	-.184**	-.057	.122	-.047	-.012
	Sig. (2-tailed)	.000	.002	.000	.175	.103	.000		.478	.004	.001	.574	.666	.470	.021	.003	.000	.067	.000	.000	.003	.004	.389	.063	.474	.851
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Conscientiousness	Pearson Correlation	-.028	.206**	.408**	-.493**	.401**	.027	.046	1	.416**	.384**	-.439**	-.401**	-.143*	-.290**	-.023	.161*	.136*	.140*	.261**	-.220**	-.115	.161*	.131*	.050	-.238**
	Sig. (2-tailed)	.664	.001	.000	.000	.000	.679	.478		.000	.000	.000	.000	.028	.000	.724	.013	.037	.031	.000	.001	.077	.014	.046	.444	.000
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Extraversion	Pearson Correlation	-.021	.162*	.437**	-.345**	.249**	.023	.184**	.416**	1	.358**	-.469**	-.306**	.099	-.062	-.089	.118	.111	.174**	.332**	-.224**	-.003	.170**	.023	-.013	-.134*
	Sig. (2-tailed)	.752	.013	.000	.000	.000	.729	.004	.000		.000	.000	.000	.129	.342	.173	.070	.088	.007	.000	.001	.966	.009	.723	.838	.041
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Agreeableness	Pearson Correlation	.106	.343**	.666**	-.295**	.488**	.090	.215**	.384**	.358**	1	-.394**	-.634**	-.276**	-.564**	-.088	.226**	.134*	.155*	.269**	-.262**	.006	.144*	.071	.091	-.227**
	Sig. (2-tailed)	.103	.000	.000	.000	.000	.171	.001	.000	.000		.000	.000	.000	.000	.176	.000	.039	.017	.000	.000	.925	.028	.284	.165	.000
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Neuroticism	Pearson Correlation	-.014	.202**	-.332**	.465**	-.404**	.078	-.037	-.439**	-.469**	-.394**	1	.337**	.243**	.306**	-.006	-.178**	.058	-.017	-.149*	.300**	-.072	-.164*	.001	.033	.075
	Sig. (2-tailed)	.828	.002	.000	.000	.000	.234	.574	.000	.000	.000		.000	.000	.000	.931	.006	.373	.792	.022	.000	.273	.012	.990	.620	.256
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Psychopathy	Pearson Correlation	.029	-.477**	-.644**	.276**	-.344**	-.126	-.028	-.401**	-.306**	-.634**	.337**	1	.324**	.580**	.213**	-.157*	-.199**	-.238**	-.279**	.311**	.090	-.207**	-.182**	-.066	.308**
	Sig. (2-tailed)	.657	.000	.000	.000	.000	.054	.666	.000	.000	.000	.000		.000	.000	.001	.015	.002	.000	.000	.000	.165	.001	.005	.317	.000
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Narcissism	Pearson Correlation	-.074	.026	-.214**	.141*	-.387**	-.097	-.047	-.143*	.099	-.276**	.243**	.324**	1	.526**	.188**	-.158*	-.028	-.105	-.028	.202**	.110	-.011	-.181**	-.083	.176**
	Sig. (2-tailed)	.254	.686	.001	.030	.000	.137	.470	.028	.129	.000	.000	.000		.000	.004	.015	.664	.109	.671	.002	.092	.865	.006	.207	.007
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Machiavellianism	Pearson Correlation	-.066	-.258**	-.462**	.226**	-.514**	-.124	-.150*	-.290**	-.062	-.564**	.306**	.580**	.526**	1	.158*	-.256**	-.077	-.166*	-.192**	.218**	.077	-.049	-.209**	-.094	.240**
	Sig. (2-tailed)	.313	.000	.000	.000	.000	.057	.021	.000	.342	.000	.000	.000	.000		.015	.000	.235	.011	.003	.001	.235	.453	.001	.149	.000
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Dominionism	Pearson Correlation	-.143*	-.153*	-.150*	.103	-.041	-.368**	-.193**	-.023	-.089	-.088	-.006	.213**	.188**	.158*	1	-.234**	.024	-.396**	-.272**	.384**	.413**	.019	-.285**	.043	.158*
	Sig. (2-tailed)	.028	.019	.021	.114	.533	.000	.003	.724	.173	.176	.931	.001	.004	.015		.000	.717	.000	.000	.000	.000	.776	.000	.456	.016
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Ecologocial_Scientism	Pearson Correlation	.403**	.112	.193**	-.221**	.087	.399**	.342**	.161*	.118	.226**	-.178**	-.157*	-.158*	-.256**	-.234**	1	.244**	.408**	.570**	-.472**	.054	-.050	.253**	.000	-.140*
	Sig. (2-tailed)	.000	.086	.003	.001	.184	.000	.000	.013	.070	.000	.006	.015	.015	.000	.000		.000	.000	.000	.000	.407	.448	.000	.998	.033
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Humanism	Pearson Correlation	-.057	.251**	.184**	-.007	.092	.235**	.119	.136*	.111	.134*	.058	-.199**	-.028	-.077	.024	.244**	1	.463**	.406**	-.068	-.039	.103	.256**	.067	-.251**
	Sig. (2-tailed)	.379	.000	.004	.918	.159	.000	.067	.037	.088	.039	.373	.002	.664	.235	.717	.000		.000	.000	.298	.548	.116	.000	.308	.000
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Moralism	Pearson Correlation	.152*	.228**	.253**	-.123	.045	.588**	.326**	.140*	.174**	.155*	-.017	-.238**	-.105	-.166*	-.396**	.408**	.463**	1	.490**	-.290**	-.203**	.013	.304**	.064	-.242**
	Sig. (2-tailed)	.019	.000	.000	.059	.487	.000	.000	.031	.007	.017	.792	.000	.109	.011	.000	.000	.000		.000	.000	.002	.841	.000	.332	.000
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Naturalism	Pearson Correlation	.207**	.256**	.330**	-.279**	.060	.401**	.244**	.261**	.332**	.269**	-.149*	-.279**	-.028	-.192**	-.272**	.570**	.406**	.490**	1	-.439**	.009	.016	.194**	.030	-.169**
	Sig. (2-tailed)	.001	.000	.000	.000	.356	.000	.000	.000	.000	.000	.022	.000	.671	.003	.000	.000	.000	.000		.000	.887	.811	.003	.652	.010
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Negativism	Pearson Correlation	-.205**	-.078	-.219**	.336**	-.155*	-.296**	-.189**	-.220**	-.224**	-.262**	.300**	.311**	.202**	.218**	.384**	-.472**	-.068	-.290**	-.439**	1	.166*	-.057	-.196**	.035	.142*
	Sig. (2-tailed)	.002	.234	.001	.000	.017	.000	.003	.001	.001	.000	.000	.000	.002	.001	.000	.000	.298	.000	.000		.010	.382	.003	.598	.030
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Utilitarianism	Pearson Correlation	.108	-.156*	-.021	.012	-.047	-.285**	-.184**	-.115	-.003	.006	-.072	.090	.110	.077	.413**	.054	-.039	-.203**	.009	.166*	1	.045	-.171**	-.033	.097
	Sig. (2-tailed)	.099	.017	.745	.858	.476	.000	.004	.077	.966	.925	.273	.165	.092	.235	.000	.407	.548	.002	.887	.010		.489	.009	.615	.139
	N	237	237	237	237	237	235	237	237	237	237	237	237	237	237	237	237	237	237	237	237	237	234	233	235	232
Oxfam	Pearson Correlation	-.081	.045	.169**	-.115	.112	-.111	-.057	.161*	.170**	.144*	-.164*	-.207**	-.011	-.043	.019	-.050	.103	.013	.016	-.057	.045	1	-.117	-.102	-.539**
	Sig. (2-tailed)	.216	.497	.010	.080	.088	.091	.389	.014	.009	.028	.012	.001	.865	.453	.776	.448	.116	.841	.811	.382	.489		.074	.119	.000
	N	234	234	234	234	234	233	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	234	233	234	230
WWF	Pearson Correlation	.047	.087	.127	-.030	.131*	.376**	.122	.131*	.023	.071	.001	-.182**	-.161*	-.209**	-.285**	.253**	.256**	.304**	.194**	-.196**	-.171**	-.117	1	-.129*	-.503**
	Sig. (2-tailed)	.476	.187	.053	.644	.045	.000	.063	.046	.723	.284	.990	.005	.006	.001	.000	.000	.000	.000	.003	.003	.009	.074		.049	.000
	N	233	233	233	233	233	232	233	233	233	233	233	233	233	233	233	233	233	233	233	233	233	233	233	233	229
BasicNeeds	Pearson Correlation	.009	.055	.059	-.001	.088	-.003	-.047	.050	-.013	.091	.033	-.066	-.083	-.094	.049	.000	.067	.064	.030	.035	-.033	-.102	-.129*	1	-.460**
	Sig. (2-tailed)	.891	.400	.367	.990	.179	.962	.474	.444	.838	.165	.620	.317	.207	.149	.456	.998	.308	.332	.652	.598	.615	.119	.049		.000
	N	235	235	235	235	235	234	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	234	233	235	231
Keep_self	Pearson Correlation	.009	-.135*	-.253**	.071	-.238**	-.178**	-.012	-.238**	-.134*	-.227**	.075	.308**	.176**	.240**	.158*	-.140*	-.251**	-.242**	-.169**	.142*	.097	-.539**	-.503**	-.460**	1
	Sig. (2-tailed)	.889	.040	.000	.283	.000	.007	.851	.000	.041	.000	.256	.000	.007	.000	.016	.033	.000	.000	.010	.030	.139	.000	.000	.000	
	N	232	232	232	232	232	231	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	230	229	231	232

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix I
Additional Analysis on Donation, Empathy, Altruism, and Agreeableness

Agreeableness' relationship to human charities (OXFAM and BasicNeeds) and other charities (WWF and Keep money for self)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.553	.087		40.636	.000
	humancharities	.402	.144	.180	2.785	.006

a. Dependent Variable: Agreeableness

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.945	.077		51.516	.000
	othercharities	-.389	.146	-.174	-2.668	.008

a. Dependent Variable: Agreeableness

Altruism's relationship to human charities (OXFAM and BasicNeeds) and other charities (WWF and Keep money for self)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	37.754	.854		44.224	.000
	humancharities	3.816	1.408	.175	2.710	.007

a. Dependent Variable: Altruism

Appendix I (cont.)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	41.579	.747		55.631	.000
	othercharities	-3.819	1.424	-.175	-2.682	.008

a. Dependent Variable: Altruism

Empathy's relationship to human charities (OXFAM and BasicNeeds) and other charities (WWF and Keep money for self)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	34.801	1.095		31.787	.000
	humancharities	2.001	1.806	.073	1.108	.269

a. Dependent Variable: Empathy

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	36.850	.958		38.481	.000
	othercharities	-2.037	1.825	-.074	-1.116	.265

a. Dependent Variable: Empathy

Appendix J
Survey for Study 2

Q1 Please create a unique identifier in case we need to find your data

___

Q2 How old are you? (please enter numerically)

___

Q3 What gender do you identify as?

Male, Female, Other

Q4 On a scale of 1-10 how would you rate the efficacy of the following in being able to help the environment

1= not at all, 10= extremely so

Save the Planet

Yourself

Donating to Charity

Q5 Which would you consider being more effective at helping the environment

Forced choice with 10 options between:

"Non-Profit Organisation" and "Individual Efforts"

Q6 Below are a number of statements, please rate on the scale below how much you agree or disagree with each one in reference to yourself.

1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree

Feel others' emotions
Suffers from others' sorrows
Am deeply moved by others' misfortunes
Don't understand people who get emotional
Am easily moved to tears
Cry easily
Am not interested in other people's problems
Seldom get emotional
Experience my emotions intensely
Feel spiritually connected to other people

Q7 Please answer the following statements about how true they are of you right now, not how you wish to be.

1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree

Appendix J (cont.)

Make people feel welcome
Look down on others
Anticipate the needs of others
Am indifferent to the feelings of others
Love to help others
Am concerned about others
Make people feel uncomfortable
Turn my back on others
Take no time for others
Have a good work for everyone

Q8 Below are a number of statements about how various topics affect your personal beliefs. There are no right or wrong answers. Using the 6-point scale shown below, please indicate how much you agree or disagree with each item.

1= strongly disagree, 2= generally disagree, 3= somewhat disagree, 4= somewhat agree, 5= generally agree, 6= strongly agree

I can anticipate difficulties and take action to avoid them
A great deal of what happens to me is probably just a matter of luck
Everyone knows that luck or chance determines one's future
I can control my problems only if I have outside support
When I make plans, I am almost certain I can make them work
My problem(s) will dominate me all my life
My mistakes and problems are my responsibility to deal with
Becoming a success is a matter of hard work, luck has little or nothing to do with it
My life is controlled by outside actions and events
People are victims of circumstances beyond their control
To continually manage my problems I need professional help
I believe a person can truly be the master of their fate
I am confident of being able to deal successfully with future problems
Maintain control over my problem(s) is due mostly to luck

Q9 For the below 50 questions please indicate on the scale how true they are of yourself.

1= inaccurate, 2=moderately inaccurate, 3=neither accurate or inaccurate, 4= moderately accurate, 5= accurate

Have a vivid imagination

Believe in the importance of art

Seldom feel blue

Have a sharp tongue

Am not interested in abstract ideas

Find it difficult to get down to work

Appendix J (cont.)

Panic easily

Tend to vote for conservative political candidates

Am not easily bothered by things

Make friends easily

Often feel blue

Get chores done right away

Suspect hidden motives in others

Rarely get irritated

Do not like art

Dislike myself

Keep in the background

Do just enough work to get by

Am always prepared

Tend to vote for liberal political candidates

Feel comfortable with myself

Avoid philosophical discussions

Waste my time

Believe that others have good intentions

Am very pleased with myself

Have little to say

Feel comfortable around other people

Am often down in the dumps

Do not enjoy going to art museums

Have frequent mood swings

Don’t like to draw attention to myself

Appendix J (cont.)

Insult people

Have a good word for everyone

Get back at others

Carry out my plans

Would describe my experiences as somewhat dull

Carry the conversation to a higher level

Don't see things through

Am skilled in handling social situations

Respect others

Pay attention to details

Am the life of the party

Enjoy hearing new ideas

Accept people as they are

Don't talk a lot

Cut others to pieces

Make plans and stick to them

Know how to captivate people

Make people feel at ease

Shirk my duties

Q10 Please select the option that indicates how much you agree or disagree with each of the following statements.

1= strongly disagree, 2= moderately disagree, 3= slightly disagree, 4= neither agree nor disagree, 5= slightly agree, 6= moderately agree, 7= strongly agree

Humans are severely abusing the environment
If things continue on their present course, we will soon experience a major ecological catastrophe
The balance of nature is delicate and easily upset
The so-called "ecological crisis" facing humankind has been greatly exaggerated
We are approaching the limit of the number of people that the Earth can support

Appendix J (cont.)

When humans interfere with nature, it often produces disastrous consequences
Human ingenuity will insure we do not make the Earth unliveable
Humans have the right to modify the natural environment to suit their needs
Humans were meant to rule over nature
Humans will eventually learn enough about how nature works to be able to control it
Despite our special abilities, humans are still subject to the laws of nature
The Earth has plenty of natural resources if we just learn how to develop them
Plants and animals have as much right as humans to exist
The balance of nature is strong enough to cope with the impacts of modern industrial nations
The Earth is like a spaceship with very limited room for resources

Q11 You will be presented three different charities, please read each one and answer the following question in regards to the information presented.

Oxfam

Oxfam understands that many causes of poverty are linked, and uses many tactics to fight poverty and inequality. From local communities to the global stage, they call for fairness and justice so that people in poverty can influence the decisions that affect them. Oxfam believes that all people are entitled to decent work, income security, essential health services, education, gender equality, security from conflict and disaster.

Save the Planet

Save the Planet aims to prevent the destruction of Earth's natural environmental, and to help build a sustainable future for humanity and the earth. Save the Planet attempts to do this by working with big organisations (such as the UN) and countries to create sustainable and environmentally friendly policies, as well as working with local communities to build sustainable growth as well as protecting local habitats and animals.

BasicNeeds

BasicNeeds believes that mental health is a right, not a privilege. For millions of mentally ill people around the world, this is not the case. For them, mental illness is a world of poverty, stigma, and isolation. BasicNeeds transforms lives by working with mentally ill people so that together, we can build a world where people with mental illness feel proud to live in.

Imagine you had $100 spare cash, consider the four options below, how would you split the money?

Oxfam
Save the Planet
BasicNeeds
To spend on yourself

Q12 If you wish could you justify your donation split (optional)

___

Q13 Did you have any comments about the survey? (leave blank if none)

___

Appendix K
Save the Planet Description

Save the Planet

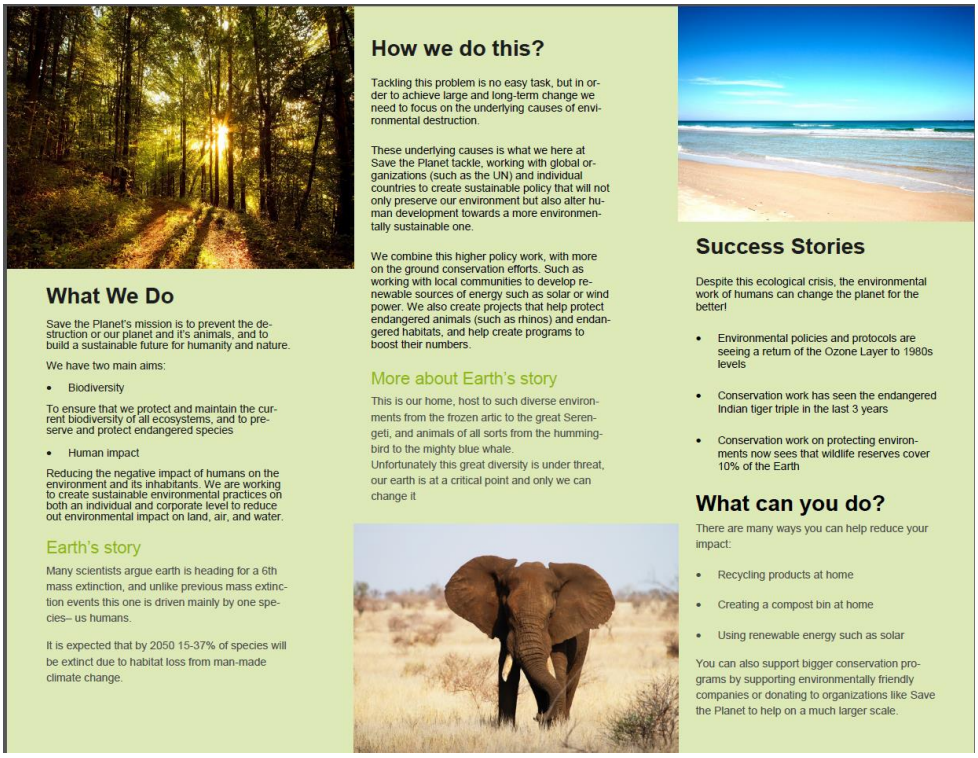
Save the Planet aims to prevent the destruction of Earth's natural environmental, and to help build a sustainable future for humanity and the earth. Save the Planet attempts to do this by working with big organisations (such as the UN) and countries to create sustainable and environmentally friendly policies, as well as working with local communities to build sustainable growth as well as protecting local habitats and animals.

Appendix L
Brochure Stimuli used in Study 2

Brochures were printed on A4 pieces of paper.

Front (for all)

Inside (positive)



Appendix L (cont.)

Inside (neutral)

What We Do

Save the Planet's mission is to prevent the destruction or our planet and it's animals, and to build a sustainable future for humanity and nature.

We have two main aims:

- Biodiversity

To ensure that we protect and maintain the current biodiversity of all ecosystems, and to preserve and protect endangered species

- Human impact

Reducing the negative impact of humans on the environment and its inhabitants. We are working to create sustainable environmental practices on both an individual and corporate level to reduce out environmental impact on land, air, and water.

Earth's story

Many scientists argue earth is heading for a 6th mass extinction, and unlike previous mass extinction events this one is driven mainly by one species– us humans.

It is expected that by 2050 15-37% of species will be extinct due to habitat loss from man-made climate change.

How we do this?

Tackling this problem is no easy task, but in order to achieve large and long-term change we need to focus on the underlying causes of environmental destruction.

These underlying causes is what we here at Save the Planet tackle, working with global organizations (such as the UN) and individual countries to create sustainable policy that will not only preserve our environment but also alter human development towards a more environmentally sustainable one.

We combine this higher policy work, with more on the ground conservation efforts. Such as working with local communities to develop renewable sources of energy such as solar or wind power. We also create projects that help protect endangered animals (such as rhinos) and endangered habitats, and help create programs to boost their numbers.

More about Earth's story

This is our home, host to such diverse environments from the frozen artic to the great Serengeti, and animals of all sorts from the hummingbird to the mighty blue whale.
Unfortunately this great diversity is under threat, our earth is at a critical point and only we can change it

Success Stories

Despite this ecological crisis, the environmental work of humans can change the planet for the better!

- Environmental policies and protocols are seeing a return of the Ozone Layer to 1980s levels
- Conservation work has seen the endangered Indian tiger triple in the last 3 years
- Conservation work on protecting environments now sees that wildlife reserves cover 10% of the Earth

What can you do?

There are many ways you can help reduce your impact:

- Recycling products at home
- Creating a compost bin at home
- Using renewable energy such as solar

You can also support bigger conservation programs by supporting environmentally friendly companies or donating to organizations like Save the Planet to help on a much larger scale.

Inside (negative)

What We Do

Save the Planet's mission is to prevent the destruction or our planet and it's animals, and to build a sustainable future for humanity and nature.

We have two main aims:

- Biodiversity

To ensure that we protect and maintain the current biodiversity of all ecosystems, and to preserve and protect endangered species

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Earth's story

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- Recycling products at home
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You can also support bigger conservation programs by supporting environmentally friendly companies or donating to organizations like Save the Planet to help on a much larger scale.

Appendix M
Online Advertisement (First-Year Psychology Student Pool): Study 2

A study on advertising and environmental conservation

This study is examining the effect of an environmental advertisement on environmental conservation, and the mediating effect of personality. Participants will view the advertisement and then answer a series of questions online in regards to it, personality and environmental conservation. This will take 20 minutes to complete. If you have any questions please feel free to email me at Alistair.Soutter@students.mq.edu.au. Testing will be conducted in c3a604, please meet in the waiting room on level 6 of c3a

Appendix N
Information and Consent Form for Study 2

Department of Psychology
Faculty of Human Sciences
MACQUARIE UNIVERSITY NSW 2109
Phone: +61 (0)2 9850 9898
Fax: +61 (0)2 9850 9912
Email: psy_off@ mq.edu.au
Chief Investigator's / Supervisor's Name: Simon Boag

Chief Investigator's / Supervisor's Title: Dr

Co-Investigator: Mr Alistair Soutter

Participant Information and Consent Form

Name of Project: Advertising and Environmental Conservation

You are invited to participate in a study examining how advertising and personality factors are related to environmental conservation. The purpose of this study is to examine the effectiveness of an advertising campaign on environmental attitudes and behaviours, and how personality factors might influence this.

The study is being conducted by Alistair Soutter and he can be contacted at Alistair.Soutter@students.mq.edu.au. This research is being conducted to meet the requirements of Masters of Research (Psychology) under the supervision of Simon Boag, phone number: +61 (0)2 9850 8024, email: Simon.Boag@mq.edu.au of the Department of Psychology.

If you decide to participate, you will be asked to review an environmental campaign brochure and complete a series of questionnaires online, which should take roughly 15-20 minutes. Responses to the questions will be recorded and analysed, however no data will be collected that will allow identification of participants. Some information contained in the brochures may be upsetting. We ask that if you feel any discomfort that you do not participate further as we do not wish to cause any harm. For those participating as part of a first year psychology requirement at Macquarie University, course credit will be awarded for half hour participation.

Any information or personal details gathered in the course of the study are confidential, except as required by law. No individual will be identified in any publication of the results. Raw data will be strictly confidential and only available to Mr. Alistair Soutter and Dr. Simon Boag. A summary of the results of the data can be made available to you on request by emailing Alistair Soutter at Alistair.Soutter@students.mq.edu.au.

Participation in this study is entirely voluntary: you are not obliged to participate and if you decide to participate, you are free to withdraw at any time without having to give a reason and without consequence. For Macquarie University first year Psychology students intending to receive course credit withdrawal will not disqualify you from receiving course credit.

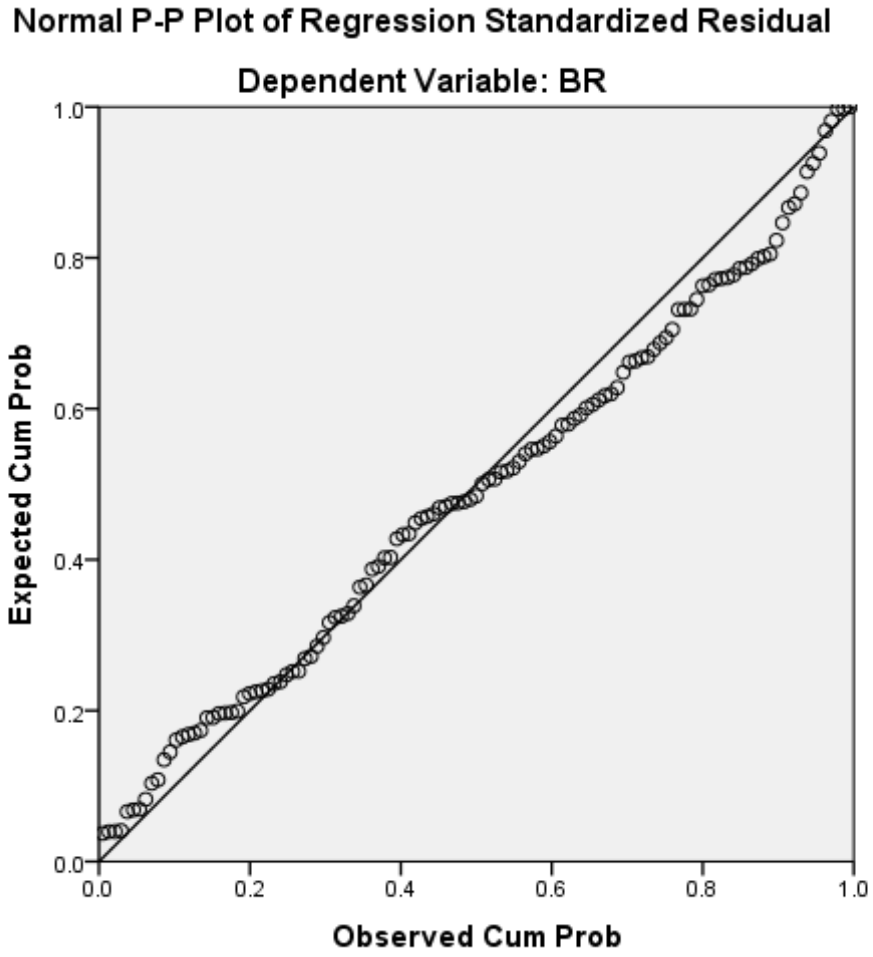
I have read and understood the information above and I agree to participate in this research.

If you agree please select "Next" to continue

Note: The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (telephone (02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

Appendix O
Violated Assumptions for Study 2

Violation of normality.



Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.070	123	.200*	.958	123	.001

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Appendix P
Correlation Matrix of Variables from Study 2

Correlations

		Age	Gender	EF_Save	Save_The_Planet	RNEPS	LOC	Empathy	Altruism	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness	positive	neutral	negative
Age	Pearson Correlation	1	-.120	.104	.083	.065	-.250**	.100	.088	.120	.224*	.242**	-.172	.240**	.111	-.008	-.102
	Sig. (2-tailed)		.186	.252	.360	.472	.005	.270	.329	.184	.013	.007	.056	.007	.221	.934	.262
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
Gender	Pearson Correlation	-.120	1	-.073	.056	.226*	.080	.182*	.207*	-.092	.189*	.063	.192*	-.122	.011	-.091	.078
	Sig. (2-tailed)	.186		.418	.539	.011	.379	.044	.021	.311	.036	.488	.033	.178	.907	.314	.389
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
EF_Save	Pearson Correlation	.104	-.073	1	.181*	.098	-.060	.138	.029	.085	-.018	.027	.048	.147	-.023	-.040	.062
	Sig. (2-tailed)	.252	.418		.045	.278	.506	.126	.753	.346	.839	.762	.594	.102	.798	.658	.495
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
Save_The_Planet	Pearson Correlation	.083	.056	.181*	1	.304**	-.222*	-.118	.059	.033	.110	.123	-.191*	.118	-.048	.040	.008
	Sig. (2-tailed)	.360	.539	.045		.001	.013	.193	.515	.717	.226	.175	.034	.192	.597	.662	.927
	N	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123	123
RNEPS	Pearson Correlation	.065	.226*	.098	.304**	1	-.050	.134	.107	.014	-.091	-.046	.163	.224*	.261**	-.086	-.173
	Sig. (2-tailed)	.472	.011	.278	.001		.581	.138	.235	.873	.316	.612	.071	.012	.003	.340	.055
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
LOC	Pearson Correlation	-.250**	.080	-.060	-.222*	-.050	1	.111	-.275**	-.167	-.390**	-.455**	.425**	-.170	.025	-.082	.054
	Sig. (2-tailed)	.005	.379	.506	.013	.581		.222	.002	.063	.000	.000	.000	.060	.780	.367	.548
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
Empathy	Pearson Correlation	.100	.182*	.138	-.118	.134	.111	1	.358**	.028	.164	-.073	.344**	.228*	-.014	-.038	.051
	Sig. (2-tailed)	.270	.044	.126	.193	.138	.222		.000	.760	.068	.421	.000	.011	.877	.672	.573
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
Altruism	Pearson Correlation	.088	.207*	.029	.059	.107	-.275**	.358**	1	.269**	.599**	.407**	-.173	.020	.004	-.078	.072
	Sig. (2-tailed)	.329	.021	.753	.515	.235	.002	.000		.003	.000	.000	.055	.826	.965	.390	.429
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
Extraversion	Pearson Correlation	.120	-.092	.085	.033	.014	-.167	.028	.269**	1	.177*	.364**	-.294**	.117	-.062	.086	-.022
	Sig. (2-tailed)	.184	.311	.346	.717	.873	.063	.760	.003		.050	.000	.001	.195	.491	.341	.805
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
Agreeableness	Pearson Correlation	.224*	.189*	-.018	.110	-.091	-.390**	.164	.599**	.177*	1	.382**	-.466**	-.082	-.029	.021	.008
	Sig. (2-tailed)	.013	.036	.839	.226	.316	.000	.068	.000	.050		.000	.000	.365	.747	.816	.927
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
Conscientiousness	Pearson Correlation	.242**	.063	.027	.123	-.046	-.455**	-.073	.407**	.364**	.382**	1	-.399**	.025	-.042	-.012	.053
	Sig. (2-tailed)	.007	.488	.762	.175	.612	.000	.421	.000	.000	.000		.000	.783	.646	.894	.561
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
Neuroticism	Pearson Correlation	-.172	.192*	.048	-.191*	.163	.425**	.344**	-.173	-.294**	-.466**	-.399**	1	.067	.043	-.032	-.010
	Sig. (2-tailed)	.056	.033	.594	.034	.071	.000	.000	.055	.001	.000	.000		.461	.639	.721	.908
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
Openness	Pearson Correlation	.240**	-.122	.147	.118	.224*	-.170	.228*	.020	.117	-.082	.025	.067	1	-.092	.047	.044
	Sig. (2-tailed)	.007	.178	.102	.192	.012	.060	.011	.826	.195	.365	.783	.461		.311	.601	.626
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
positive	Pearson Correlation	.111	.011	-.023	-.048	.261**	.025	-.014	.004	-.062	-.029	-.042	.043	-.092	1	-.476**	-.521**
	Sig. (2-tailed)	.221	.907	.798	.597	.003	.780	.877	.965	.491	.747	.646	.639	.311		.000	.000
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
neutral	Pearson Correlation	-.008	-.091	-.040	.040	-.086	-.082	-.038	-.078	.086	.021	-.012	-.032	.047	-.476**	1	-.502**
	Sig. (2-tailed)	.934	.314	.658	.662	.340	.367	.672	.390	.341	.816	.894	.721	.601	.000		.000
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124
negative	Pearson Correlation	-.102	.078	.062	.008	-.173	.054	.051	.072	-.022	.008	.053	-.010	.044	-.521**	-.502**	1
	Sig. (2-tailed)	.262	.389	.495	.927	.055	.548	.573	.429	.805	.927	.561	.908	.626	.000	.000	
	N	124	124	124	123	124	124	124	124	124	124	124	124	124	124	124	124

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix Q

Macquarie University Ethics Approval

Dear Dr Boag,

Re: "The personality of an environmental conservationist"(5201500040)

Thank you very much for your response. Your response has addressed the issues raised by the Faculty of Human Sciences Human Research Ethics Sub-Committee and approval has been granted, effective 19th February 2015. This email constitutes ethical approval only.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel is authorised to conduct this research:

Dr Simon Boag
Mr Alistair Soutter

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).

2. Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 19th February 2016
Progress Report 2 Due: 19th February 2017
Progress Report 3 Due: 19th February 2018
Progress Report 4 Due: 19th February 2019
Final Report Due: 19th February 2020

NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Sub-Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

Appendix Q (cont.)

4. All amendments to the project must be reviewed and approved by the Sub-Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Sub-Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

http://www.mq.edu.au/policy

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

If you need to provide a hard copy letter of approval to an external organisation as evidence that you have approval, please do not hesitate to contact the Ethics Secretariat at the address below.

Please retain a copy of this email as this is your official notification of ethics approval.

Yours sincerely,

Dr Anthony Miller
Chair
Faculty of Human Sciences
Human Research Ethics Sub-Committee

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NSW 2109

Ph: +61 2 9850 4197
Fax: +61 2 9850 4465

Email: fhs.ethics@mq.edu.au
http://www.research.mq.edu.au/

Appendix Q (cont.)

Dear Dr Boag,

RE: 'Advertising and Environmental Conservation' (Ref: 5201500040)

Thank you for your recent correspondence regarding the amendment request. We apologise for the delay in responding to the request.

The amendments have been reviewed and we are pleased to advise you that the amendments have been approved.

This approval applies to the following amendments:

1. Change in Project title - Advertising and Environmental Conservation;
2. Supporting documents noted

a) Qualtrics Survey Questions (including Information and Consent form)
b) Psych pool advert;
c) Environmental brochures - negative, neutral and positive.

3. Changes in questions and scale, as stated in Section 6.

Please accept this email as formal notification that the amendments have been approved. Please do not hesitate to contact us in case of any further queries.

All the best with your research.

Kind regards,

FHS Ethics
****
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