The relative importance of pro-environmental self-efficacy on pro-environmental intention and behaviour and the moderating role of materialism

---

Radboud University

Name	Melanie van Eck
Student number	s1065330
Supervisor	Dr C. Horváth
Second examiner	Dr H.W.M. Joosten

Acknowledgements

This thesis, which you are reading now, is the final part of my Master's degree in Marketing at Radboud University. This thesis investigates the relative importance of pro-environmental self-efficacy on pro-environmental intentions and behaviour and the moderating role of materialism. This thesis has contributed to my sustainability knowledge and challenged my capabilities in writing and conducting analyses. Furthermore, it has taught me a lot about the impact of different efficacies on intentions and behaviour and how to try and change my ways to improve living conditions on earth.

Through writing this thesis, conducting the questionnaire and doing the analysis, I realised that we can change the world and that every little action can help us achieve a better world for ourselves and future generations. Furthermore, this thesis delivers managers and companies insights into how to tackle these issues and improve the behaviour of their employees and customers. I genuinely hope this thesis can give everyone who reads this the extra push to start living a more environmentally-friendly life.

Then it is my turn to thank the people who helped me through this process, as I would not have been able to do all of this on my own. First, I would like to thank my supervisor Dr C. Horváth, who has helped me with all my questions, provided me with great feedback and made time to discuss my progress. Secondly, I would like to thank my second examiner, Dr H. W. M. Joosten, for his supervision, support, feedback and advice while writing my thesis. I would also like to thank the other researcher, Eldin Oric, who has helped me with the data collection and the analysis. Without you, it would have been a lot harder.

Furthermore, I would like to thank my family, friends and boyfriend. Without your support, kind words, questionnaire distribution and critical reflection, I would not have been able to finish my thesis. I would also like to thank Ryan Wrightman and Kirsten van Enk, who both helped me with the English writing aspect; your knowledge and expertise are highly appreciated.

Lastly, from the bottom of my heart, I would like to thank all the respondents who spent a lot of time and effort filling out the questionnaire. Their answers have been beneficial for the data that has been used in this thesis.

Melanie van Eck,

Lunteren, 13 June 2022

Abstract

Global environmental change has become one of humanity's most worrying, crucial, and significant challenges. There is a growing need for PEB that can help reduce these worrying circumstances, which are highly influenced by psychological factors such as self-efficacy. However, previously self-efficacy has only been investigated as a unidimensional construct. In contrast, this thesis has combined the different aspects of self-efficacy into a multidimensional construct that explores the relationship between pro-environmental self-efficacy and PEI and PEB. The relationship between pro-environmental self-efficacy, PEI and PEB was explained more thoroughly by including materialism. Lastly, this thesis also added a different concept in which a beginning was made by investigating whether people that already perform PEB would be willing to put extra effort into behaving environmentally friendly. Quantitative research was analysed with 307 respondents using two multiple regression analyses with a moderation effect to explain the relationship between the dependent, independent, and moderator variables. The results showed that the different types of self-efficacy have a direct positive impact on PEI and PEB. The moderating role of materialism in this thesis, was explicitly measured for the independent variable individual outcome expectancy. Materialism had a significant, negative, small effect on this relationship. This indicates that the more materialistic a person is, the lower the impact of individual outcome expectancy will be on PEI and PEB. When adding all the models to the analysis, the independent variable pro-environmental individual outcome efficacy is the most important predictor for PEI and PEB. Moreover, the educational level of the respondents positively influences pro-environmental intentions and PEB. Additionally, environmental attitudes remained significant throughout the analysis. Lastly, most of the respondents that already performed PEB still intended to do more. With this knowledge, managers must focus mainly on the specific outcomes of PEB and on why it contributes to generating a more sustainable world to live on. Managers should try to educate their employees and customers on the consequences of their actions, increasing their attitudes, which leads to more PEI and PEB. Furthermore, managers might need to educate their employees and customers on the adverse effects of materialism.

Keywords: Pro-environmental self-efficacy – Pro-environmental intentions – Pro-environmental behaviour – Materialism – Extra effort.

Table of contents

1. Introduction

Global environmental change has become one of humanity's most worrying, crucial, and significant challenges. Human activity has emerged as the primary source of this rapid climate change (Swim et al., 2011). Humanity has drastically increased the global average temperature by engaging in environment-impacting activities such as cutting down forests. These environmental-impacting activities have triggered a cascade of related issues, such as air pollution, biodiversity loss, melting continental glaciers, greenhouse gas emissions, water shortages, and more. These changes and their consequences pose a rising risk to the planet's life support system and a multitude of species (Vlek and Steg, 2007; O'Brien, 2013; UNEP, 2012). Many of these issues are caused by materialistic consumption-focused behaviour that ignores environmental responsibility (Vlek and Steg, 2007; Gardner & Stern, 2002).

There is growing recognition that environmentally beneficial behaviours can help to reduce these negative environmental consequences. This type of behaviour is referred to as pro-environmental behaviour (PEB). It is defined as "behaviour that consciously seeks to minimise the negative impact of one's actions on the natural and built world." (Kollmuss & Aygeman, 2002, p. 240). PEB is a form of prosocial behaviour "directed toward and performed to promote the welfare of an individual, group or organisation" (Ramus & Killmer, 2007, p. 556). Thus, the importance of PEB is related to decreasing the negative impact consumers have on the environment.

Therefore, PEB should be initiated to limit this negative environmental impact. Several factors might contribute to this. The main factors influencing PEB include internal and external elements, namely demographic and psychological aspects (Li et al., 2019). Self-efficacy is one of these psychological factors influencing both pro-environmental intentions (PEI) to perform PEB and actual PEB. Self-efficacy influences how people feel, think and act in certain situations (Bandura, 1977). Furthermore, self-efficacy has been defined as a personal assessment of one's ability to mobilise the motivation, cognitive capacities, and behaviour needed to deal with an impending scenario (Bandura, 2002; Wood & Bandura, 1989). Furthermore, self-efficacy has been described as an individual's views about their ability to perform behaviours that will positively affect important parts of their lives (Bandura, 1984). Furthermore, self-efficacy has been proposed as a driving force that may impact PEB (Lanzini & Thøgersen, 2014; Thøgersen & Crompton, 2009). Because self-efficacy impacts behaviour through numerous processes, it may be necessary to view self-

efficacy as a driving factor to promote PEB. Examples of these processes are cognitive, motivational, emotional, and selective processes (Bandura, 1986). Additionally, self-efficacy promotes behavioural engagement and can impact both the learning and the integration of new behavioural types (Bandura, 1977) as well as behavioural choice (Bandura, 2002). Self-efficacy can also influence people's effort in performing specific behaviour (Bandura, 1997, 2002). People with high self-efficacy, for example, exhibit more remarkable tenacity toward a physical activity than individuals with low self-efficacy (Hutchinson et al., 2008). Moreover, individuals with strong pro-environmental self-efficacy and pro-environmental outcome expectancy participate in more PEB than those that score lower on those efficacies (Sawitri et al., 2015). Furthermore, there has been quite some research showing that self-efficacy encourages PEB, such as using reusable shopping bags (Lam, 2006) and recycling behaviour (Tabernero & Hernandez, 2011). Another interesting finding is that people's intentions to perform PEB can increase collective self-efficacy (Jugert et al., 2016). Furthermore, research has shown that higher self-efficacy increases goal commitment and encourages people to develop more ideas during a brainstorming performance (Locke et al., 1984). These findings imply that as soon as people have higher levels of self-efficacy in relation to PEB, it should drive them to exert more effort and perseverance in engaging in PEB (Lauren et al., 2016).

Even though the previous studies indicated that self-efficacy influences PEB, the literature takes a simplistic approach to assessing the influence of self-efficacy on PEB. Most research uses a straightforward, unidimensional conception of self-efficacy; however, in the context of sustainability, this one-dimensional approach is insufficient to understand the essence of the relationship between self-efficacy and PEI and PEB. The main reason is that sustainability does not solely depend on individual action but also activities performed by a group. Furthermore, research shows several forms of self-efficacy influence PEB. Adopting a multidimensional approach will better explain the relative effects of these types of self-efficacies. Additionally, it will show the overall impact of pro-environmental self-efficacy on PEI and PEB. Therefore, a more complicated approach toward self-efficacy is required to understand the relationship above.

The aspects of self-efficacy that have been added to create a multidimensional pro-environmental self-efficacy are *pro-environmental individual self-efficacy expectancy*, *pro-environmental individual outcome expectancy, pro-environmental collective efficacy expectancy* and *pro-environmental collective outcome expectancy*. A distinction has been

made between individual and collective self-efficacy. Individual self-efficacy expectancy is the "conviction that one can successfully execute the behaviour required to produce the outcomes" (Bandura, 1977, p.141). In contrast, individual outcome expectancy is "a person's estimate that a given behaviour will lead to certain outcomes" (Bandura, 1977, p.141). Outcome expectancy is said to play a role in developing cognitive explanations of behaviours. For example, positive outcome expectancy increases peer aggressiveness (Pornari & Wood, 2010), higher physical activity (Williams et al., 2005), academic performance (Zimmerman, 2000), and actions regarding increasing one's health (Gao et al., 2008). Furthermore, research showed that self-efficacy and outcome expectancy are related to sustainability as they can help understand the development of environmentally friendly behaviours (Sawitri et al., 2015).

Furthermore, collective self-efficacy, like self-efficacy, may influence the amount of effort members of a group put into pursuing mutual goals (Bandura, 2000). Collective efficacy positively influences PEB related to sustainability (Jugert et al., 2016). Furthermore, customers are willing to pay more for sustainable products if other customers hold similar attitudes (Doran et al., 2015). According to previous research, individuals with greater levels of collective efficacy did more to ensure clean drinking water than individuals with lower levels of collective efficacy (Thaker, 2012). Similarly, individuals who engaged in domestic rubbish management were more easily persuaded that if everyone participated, the waste problem might be reduced than people who did not participate in domestic rubbish management (Bonniface & Henley, 2008).

Moreover, the relationship between pro-environmental self-efficacy and PEB should be investigated as the variable *materialism* moderates it. This relationship should be investigated as consumer characteristics such as materialism may influence engagement in PEB. It has been shown that people who endorse materialism perform fewer ecologically helpful behaviours and have larger environmental footprints (Brown & Kasser 2005, Richins & Dawson 1992) compared to people who are less materialistic. Furthermore, a materialistic lifestyle will likely increase greenhouse gas emissions and resource consumption (Andersson & Nässén, 2016; Hedlund-de Witt et al., 2014). Moreover, low self-efficacy is often linked to materialism, as power and control are the underlying motives for materialism (Flouri, 2005). In addition, performance accomplishments are one of the significant sources of self-efficacy (Bandura, 1999). However, when purchasing items or by having expensive items, the

accomplishments or rewards are only temporary, which causes the individual to feel worse again after a while. Therefore, it is very likely that the degree to which a person has materialistic values will negatively influence their self-efficacy, leading to decreased PEI and PEB.

Despite the possible differences between people who strongly endorse materialism and those who place a low priority on materialism, the mass knowledge on PEB is mainly based on the relationship between PEB and materialism. It does not include the relative importance of the different aspects of pro-environmental self-efficacy. In this thesis, the relationship between pro-environmental individual outcome expectancy, PEI and PEB is explored for the various degrees to which people engage in materialism, and the findings are contrasted. This paper thus fills the gap mentioned above by investigating the relationship between the relative importance of the different aspects of pro-environmental self-efficacy, PEI and PEB, and the relationship between pro-environmental individual outcome expectancy, PEI and PEB for people engaging in various degrees of materialism. This research will fill the gap by answering the following question: "What is the relative importance of the different aspects of pro-environmental self-efficacy on pro-environmental intention and behaviour moderated by materialism?"

This thesis will first generate new knowledge on the relative importance of pro-environmental self-efficacy and how these influence PEI and PEB. The studies mentioned in the previous paragraph use self-efficacy as a unidimensional construct. In contrast, this thesis will combine the different aspects of self-efficacy into a multidimensional construct that investigates the relationship between pro-environmental self-efficacy and PEI and PEB. By combining the various elements of self-efficacy, a better understanding of the relative importance of these aspects on PEI and PEB is generated. Furthermore, literature has shown that self-efficacy varies among people (Cervone, 2000). When including multidimensional pro-environmental self-efficacy, the results can show whether the effects of the different aspects can explain this variance. Additionally, Bruning et al. (2013) have previously studied the multiple dimensions of self-efficacy in the writing domain. This portrays the relevancy of this thesis as it shows that self-efficacy in other domains could be expanded by including this multidimensional aspect. Lastly, the relationship between pro-environmental self-efficacy, PEI and PEB can be explained more thoroughly by including materialistism. This shows the extent to which pro-

environmental self-efficacy influences PEI and PEB when consumers engage in different degrees of materialism.

The academic contribution of this thesis is that different aspects of self-efficacy are added to create a multidimensional approach toward pro-environmental self-efficacy. Furthermore, this thesis will examine the effects of this multidimensional pro-environmental self-efficacy on PEI and PEB. In addition, this model has added *materialism* to determine whether engaging in materialistic behaviour impacts the relationship between the multidimensional pro-environmental self-efficacy, PEI and PEB. This moderating variable also examines whether other moderators that might influence the relationship between pro-environmental self-efficacy, PEI and PEB can be found. Therefore, this thesis can be relevant to academics as it can be a starting point for future research, including a multidimensional approach toward self-efficacy.

Furthermore, this thesis' managerial and societal contribution is that it could assist managers, firms, and all other parties engaged in understanding the behaviour of consumers towards adopting more PEB and how to steer consumers in the direction of performing these types of behaviours. Various researchers explicitly mention the importance of the managerial and the marketing field by stating, for example, that how both individuals and groups behave is a crucial issue in achieving environmental sustainability (Fischer et al., 2012) and striving towards a more sustainable future requires individuals to change their behaviours that are destructing the environment (Gifford, 2011). By investigating these dimensions and uncovering the relative importance of these drivers, managers can get helpful insights that help stimulate more PEB from, e.g. their customers or employees. Additionally, the societal relevance is that it will give customers a better understanding of how their behaviours are influenced by self-efficacy and help them reach their sustainability goals. Therefore, the outcomes of this research will provide managers and customers with critical insights into creating a sustainable planet for future generations.

2. Literature review

2.1 Pro-environmental behaviour

The commonly accepted definition of pro-environmental behaviour is "behaviours that consciously seek to minimise the negative impact of one's actions on the natural and built world" (Kollmuss & Agyeman, 2002, p. 240). Furthermore, it has been argued that "PEBs are a form of prosocial behaviour directed toward and performed to promote the welfare of an individual, group or organisation (Ramus & Killmer, 2007, p. 556) and "Any action that enhances the quality of the environment, either resulting in or not resulting from pro-environmental intent" (Steg et al. 2014, p.29). PEB has a beneficial influence on the supply of raw materials or energy and has the potential to change the systematics of eco-systems or the environment (de Groot & Steg, 2010; Steg & Vlek, 2009). As a result, various studies have focused on the significance of, and the need to comprehend, PEB, as well as the variables and the underlying motives of this behaviour (Gleim et al., 2013; Strizhakova & Coulter, 2013; Polonsky et al., 2014).

PEB includes different kinds of behaviour, such as recycling (Klöckner & Oppedal, 2011), transport use (Eriksson et al., 2008), energy consumption (Berardi, 2017), waste management (Rigamonti et al., 2014), purchasing "green" products (Ramayah et al., 2010), conserving water (Yusliza et al., 2020), use of electrical appliances (Aizawa et al., 2008), and use of electric vehicles (Bockarjova & Steg, 2014). These behaviours can be divided into three categories: waste reduction, reuse and recycling. Furthermore, PEB can be performed at both the individual level (e.g., using a wooden toothbrush) and the societal level (e.g. environmental citizenship and policy support) (Monroe, 2003). This behaviour might occur in public (such as engagement in movements concerning the environment) or private areas (such as buying organic products) (Hadler & Haller, 2011).

Furthermore, previous research has distinguished two types of PEB: direct and indirect PEB (Monroe, 2003). Direct behaviour is behaviour that can be measured and is done immediately by an individual or a group. In contrast, indirect behaviour involves behaviour that cannot be directly measured and aims to change policies to encourage direct behaviour. Thus, direct PEB involves directly using vehicles and products that are sustainable. In contrast, indirect PEB consists in changing a government policy to increase the affordability of driving a hybrid car.

While the categories of PEB are thoroughly addressed, the determinants are less apparent. However, in this case, recycling behaviour, the determinants of PEB can be divided into three groups: psychological factors, environmental characteristics and situational factors. Environmental qualities are an individual's perspectives that influence their behaviour. Motivation, response efficacy, social norms, personal fulfilment, altruism and self-efficacy are examples of psychological factors (Barr et al., 2003) Finally, situational variables facilitate an activity, such as demographics, prior experiences, and related knowledge (Barr et al., 2003).

As previously mentioned, the literature discovered a diverse set of PEB and PEB determinants. The PEB determinants chosen for this thesis, include pro-environmental self-efficacy, pro-environmental individual outcome expectancy, pro-environmental collective efficacy and pro-environmental collective outcome expectancy, which will be covered later in this section. This thesis will provide insights into the relative importance of these pro-environmental efficacies on PEI and PEB.

2.2 Pro-environmental intention

Pro-environmental intention is defined as "the willingness to engage in pro-environmental behaviour" (Carfora et al., 2017, p.844). Furthermore, the intention to perform a specific behaviour has been characterised as a powerful internal stimulation and is frequently seen as the source of behaviour (Moisander, 2007). Furthermore, PEI is a person's perceived subjectivity of participation in PEB, representing the person's propensity to participate in a given PEB (Kaiser & Gutscher, 2003).

Previous studies found that intentions to recycle newspapers influenced actual recycling behaviour, and recycling attitudes predicted these intentions (Boldero, 1995). Additionally, in sustainability, the willingness to engage in pro-environmental actions depends on collective efficacy knowledge, experience, and perception (Reese & Junge, 2017). Although some studies recognise collective efficacy as a significant predictor of PEI, other studies pay more attention to the relationship between individual and collective efficacy to understand PEI (Jugert et al., 2016). In previous research on health intentions, it was found that individuals who reported lower intentions to act also had low levels of self-efficacy. Therefore, a strong relationship between self-efficacy and behavioural intention exists; hence, individual self-efficacy needs to be manipulated somehow (Sirois, 2004). In conclusion, PEI is firmly or, at worst, moderately related to PEB (Auhagen & Neuberger, 1994).

2.3 Theory of planned behaviour (TPB)

Current research is focused on whether or not intentions are directly transferred into behaviour. This challenge is referred to as the "intention-behaviour gap". This difference between intention and behaviour represents the underlying psychological mechanisms that go from intention to action (Sniehotta et al., 2005). Various examinations of the intention-behaviour gap have discovered that this gap is primarily due to those who plan to act but fail to act on these planned intentions (Sheeran, 2002).

Furthermore, previous research on behavioural intentions discovered that outcome expectancies, self-efficacy and risk awareness are all important determinants of intention (Garcia & Mann, 2003). Detailed action planning and self-efficacy seem to be powerful antecedents of actions related to one's health (Abraham et al., 1998; Kuhl & Fuhrmann, 1998). Furthermore, several researchers have successfully improved motivational prediction models, such as the Theory of Planned Behaviour (Ajzen, 1991), with volitional constructs (e.g. intentions to implement) (Kuhl & Fuhrmann, 1998; Orbell, 2003). During the motivational phase, a person forms intentions to act based on expected outcomes, risk perceptions and self-efficacy. Next, the intentions must be initiated and maintained in the volitional phase. Furthermore, according to the TPB, perceived behavioural control, which includes self-efficacy and controllability, drives behaviour through intentions (Ajzen, 1991). Additionally, the TBP emphasizes the significance of self-efficacy in sustaining behavioural change (Prochaska & Velicer, 1997). Thus, the relevance of self-efficacy in PEI and PEB is demonstrated by its primacy within this theory.

To conclude, the theory of planned behaviour (Ajzen, 1991) relates to the current study as it shows how individuals develop their behaviours through intentions motivated by self-efficacy. Similarly, this thesis emphasises the importance of self-efficacy on intentions and behaviour and separates intentions from behaviour. The TPB can help this thesis by diving deeper into the antecedents of intentions, translating into actual behaviour. This will be adjusted to PEI and PEB in the current research. Finally, the TPB can help by providing insights into what encourages people to translate these intentions into actual behaviour.

2.4 Pro-environmental self-efficacy expectancy & outcome expectancy

2.4.1 Pro-environmental self-efficacy expectancy

Self-efficacy is defined as people's perceptions regarding their capability of successfully performing a behaviour (Bandura, 1977, 1986, 1997). Moreover, self-efficacy was identified as a construct that potentially influences behaviour in multiple ways (Mortan et al., 2014). t

has been proposed that self-efficacy beliefs influence whether activities are undertaken, the amount of effort that is expended, and how actions are sustained when obstacles emerge (Norman & Conner, 2005). A theory related to self-efficacy is the Theory of Self-Efficacy (ToSE) (Bandura, 1977). ToSE is based on social cognitive theory and conceptualises person-behaviour-environment interaction as triadic reciprocity (Bandura, 1997). This theory describes the antecedents of the individuals' beliefs about whether they can perform a behaviour (self-efficacy expectancy) and whether this behaviour will produce a given outcome (outcome expectancy).

Therefore, self-efficacy can be differentiated from intentions as intentions represent the willingness to perform a behaviour, whereas self-efficacy entails believing that one can explicitly perform a behaviour (Bandura, 1997, p.43). The main idea behind self-efficacy theory is that a person's life is frequently directed by one's conviction in one's skills. For example, people with high self-efficacy, see obstacles as something that can be overcome (Nguyen, 2019). People with low self-efficacy, on the other hand, believe they cannot and prefer to select simple tasks (Bandura, 1997). Furthermore, a high level of self-efficacy encourages an individual to remain optimistic and manage negative emotions (Bandura, 1997). These individuals with high levels of self-efficacy prefer to focus more on possibilities while either ignoring challenges or view these challenges as "part of the game" (Locke & Baum, 2007). Self-efficacy has been shown to influence different aspects of human behaviour such as physical activity (Luszcynzka et al., 2010), academic contexts (Bandura, 1997), and work-related behaviour (Hannah et al., 2012) and PEB (e.g. Clayton et al., 2013). Additionally, the literature distinguishes between individual and collective efficacy expectations and outcome expectancies.

Furthermore, self-efficacy can be related to sustainability, naming it pro-environmental self-efficacy. Previous studies in this domain have found that "individuals with the higher judgement of their capacity to recycle also engage in more recycling behaviour" (Tabernero & Hernández, 2011, p. 669), and "adolescents who have higher levels of perceived self-efficacy are reporting more PEB than adolescents who have lower levels of self-efficacy" (Meinhold & Malkus, 2005, p.17). Therefore, according to the research by Tabernero & Hernández (2011) and Meinhold & Malkus (2005), individuals with higher self-efficacy also engage in PEB.

In this research, these distinctions will also be taken into consideration. Thus, it will focus on pro-environmental self-efficacy expectancy, pro-environmental individual outcome expectancy, collective efficacy expectancy and collective outcome expectancy.

Self-efficacy expectancy is “the conviction that a person can successfully execute the behaviour required to produce the pursued outcomes” (Bandura, 1977, p. 193). Thus, self-efficacy expectancy is one’s judgement of capability for successfully executing behaviour. If a person does not believe they can execute a type of behaviour, they are not likely to try it, and if they try it, how long will they persist. These expectations impact how the amount of effort people will spend and for how long they will persevere despite hurdles and negative experiences. Therefore, the concept of pro-environmental self-efficacy is fundamental to consider regarding the actual PEI and PEB. With low pro-environmental self-efficacy expectancy, PEB is not likely to be executed. Therefore, the first hypotheses are as follows:

H1a. *Pro-environmental self-efficacy expectancy positively influences pro-environmental intention.*

H1b. *Pro-environmental self-efficacy expectancy positively influences pro-environmental behaviour.*

2.4.2 Pro-environmental individual outcome expectancy

Outcome expectancy is a person’s expectations about whether their behaviour will lead to specific outcomes (Bandura, 1977*).* Thus, outcome expectancies are beliefs about the behaviour’s advantages and disadvantages. Positive outcome expectancies will impact behaviour as they function as an incentive to portray that behaviour. In contrast, negative outcome expectancies will be a disincentive to portray that behaviour (Gao et al., 2008). Although there is limited research on outcome expectancies compared to self-efficacy expectancy on behaviour, there is ample evidence that outcome expectancies play a role in predicting behaviour (Gao et al., 2008). Previous research indicated that high outcome expectancy enhanced attendance in the sports domain (Damush et al., 2001).

When relating outcome expectancy to the environmental domain, outcome expectancy has been defined as "the beliefs about the consequences of PEB taken by individuals." (Sawitri et al., 2015, p.31). In this domain, outcome expectancies are essential when achieving desired behaviour is relatively simple, but the perceived outcomes are unknown (Koletsou & Mancy, 2011).

While pro-environmental self-efficacy expectancy and pro-environmental individual outcome expectancy are related, they are differentiated because individuals can believe that they are capable of executing PEB yet not believe that the PEB will effectively mitigate risks associated with the environment. The aforementioned indicates that outcome expectancy also affects PEI and PEB.

H2a. *Pro-environmental individual outcome expectancy positively influences pro-environmental intention.*

H2b. *Pro-environmental individual outcome expectancy positively influences pro-environmental behaviour.*

2.5 Pro-environmental collective efficacy expectancy & outcome expectancy

2.5.1 Pro-environmental collective efficacy expectancy

Many individuals display pro-environmental attitudes, according to previous research on PEB. However, these attitudes do not always correspond to PEI or PEB (e.g. Smythe & Brook, 1980; Scott & Willits, 1994). This discrepancy can be explained by the fact that, while self-efficacy beliefs impact people's actions in addressing individual problems, they may be less significant for collective attempts to tackle challenges viewed as a whole (e.g. global warming; Homburg & Stolberg, 2006).

Thus, the concept of pro-environmental collective efficacy is an essential addition to this thesis. Humans are social beings that rely on one another to solve problems that affect their overall quality of life (Bandura, 1986). Furthermore, sustainability issues can usually solely be achieved through collective actions, as consumers have only a minor influence on these issues. As a result, the pro-environmental individual self-efficacy and pro-environmental outcome expectancies described previously are insufficient to understand PEI and PEB. Collective efficacy beliefs, like self-efficacy, are believed to impact people's behaviour by means of collective effort, the amount of effort put in, the way in which resources are utilised, and their perseverance when their group efforts face hurdles (Bandura, 2006).

Therefore, collective efficacy will be investigated; similarly to self-efficacy, which affects individual behaviour, the amount of effort put in by group members to achieve common goals is known as collective efficacy (Bandura, 1997; Doran et al., 2015). Building on the theoretical framework of self-efficacy, Bandura noted that “collective efficacy will influence what people choose to do as a group, how much effort they put into it, and their perseverance when group efforts fail to produce results” (Bandura 1982, p.143). Furthermore, research

conducted by Homburg and Stolberg (2006) added that collective efficacy, not self-efficacy, might predict people's participation in actions related to environmental challenges. Also, when consumers lack the belief that their actions collectively do not impact sustainability, they are less likely to engage in PEB (Homburg & Stolberg, 2006). Additionally, prior research has demonstrated that the increase in pro-environmental collective efficacy embellished consumer intentions by generating a sense of efficacy transmitted from the collective to the individual (Jugert et al., 2016). These findings imply that when consumers engage as a group, they believe they can better attain their sustainability goals. Given the collective nature of climate mitigation efforts, the following two hypotheses are developed:

H3a. *Pro-environmental collective efficacy expectancy positively influences pro-environmental intention.*
H3b*. Pro-environmental collective efficacy expectancy positively influences pro-environmental behaviour.*

2.5.2 Pro-environmental collective outcome expectancy
Since the distinction between self-efficacy expectancy and individual outcome expectancy is so important, several studies have attempted to draw the same distinction collectively (Carriço and Riemer, 2011). At the collective level, outcome expectancy is the idea one holds about "the consequences their group will experience as a result of the group's performance of tasks" (Riggs & Knight, 1994, p. 756), or the belief that collective action will lead to the desired outcome. Prior research has revealed that collective outcome expectancy is linked to a stronger moral imperative to reduce greenhouse gas emissions and, as a result, intentions to execute these activities (Joireman et al., 2010). It was suggested that the collective's behaviour influences an outcome that group members seek. Therefore, the collective may push individuals to save more energy through a stronger sense of collective outcome beliefs. The addition of pro-environmental collective outcome expectancy, next to pro-environmental collective expectancy, can contribute to this research by providing reasons why consumers engage in PEB due to collective beliefs.

H4a*. Pro-environmental collective outcome expectancy positively influences pro-environmental intention.*
H4b. *Pro-environmental collective outcome expectancy positively influences pro-environmental behaviour.*

2.6 Materialism

Recognising that the different extents to which people engage in materialism may influence the relative importance of the various dimensions of self-efficacy to affect PEI and PEB, the differences in the degree to which people engage in materialism can influence the relationship between self-efficacy and PEI and PEB. Materialistic values are defined as "a value or goal that reflects the extent to which an individual believes that it is important to acquire money and possessions, as well as to strive for the related aims of an appealing image and high status/popularity, both of which are frequently expressed via money and possessions" (Kasser, 2016, p. 490).

When relating materialism to PEB, it has been shown that people who endorse materialism perform fewer ecologically helpful behaviours and have larger environmental footprints (Brown & Kasser 2005, Richins & Dawson 1992) compared to people who are less materialistic. Furthermore, research done in Western nations or other industrialised regions have repeatedly demonstrated that those who are more materialistic are less concerned about environmental problems (Hirsh & Dolderman, 2007; Joung, 2013) and less inclined to adopt environmental preservation as a behavioural goal in the future (Hirsh & Dolderman, 2007). Furthermore, a materialistic way of life will likely increase greenhouse gas emissions (Andersson & Nässén, 2016) and resource use (Hedlund- de Witt et al., 2014). Finally, materialistic individuals are unlikely to recycle (Tilikidou & Delistavrou, 2001) and unlikely to accept blame for water scarcity issues (Bauer et al., 2012).

Materialistic people usually have low perceived self-efficacy, as material incentives may fail to provide a sense of success because they may be unreachable or unsatisfactory, resulting in lower self-efficacy (Flouri, 2005; Watson, 2014). Moreover, when an individual has both poor clarity of self- concept and low self-efficacy, the individual is more prone to assigning control to strong individuals, and to use materialism to achieve control (Watson, 2014).

Moreover, low self-efficacy is often linked to materialism, as power and control are the underlying motives for materialism (Flouri, 2005). In addition, performance accomplishments are one of the significant sources of self-efficacy (Bandura, 1999). The disadvantage of materialism is that it can become an disappointing spiral of escalating expectations with a short-term consequence as opposed to the fulfilment in the long-run caused by intrinsic rewards (Kashdan & Breen, 2007; Kasser & Ahuvia, 2002; Kasser & Ryan, 1996). When for example, purchasing items or by having expensive items, the accomplishments or rewards are

only temporary, which causes the individual to feel worse again after a while. Therefore, it is very likely that the degree to which a person has materialistic values will negatively influence their self-efficacy, leading to decreased PEI and PEB.

Based on the above discussion, materialism is stated to moderate the relationship between pro-environmental individual outcome expectancy and PEI and PEB. Therefore it is expected that different levels of materialism will result or come with varying levels of self-efficacy. Hence, the interaction effect with materialism will either decrease or increase the effect pro-environmental individual outcome expectancy has on both PEI and PEB. For instance, a person that scores very high on materialism will likely have relatively low self-efficacy and probably, not engage that much in PEI and PEB, according to the above discussion.

Therefore, the following hypotheses, including the moderator "materialism", are formed:

H2c. *The effect of individual outcome expectancy on pro-environmental intention decreases when the degree to which a person engages in materialism increases.*

H2d. *The effect of individual outcome expectancy on pro-environmental behaviour decreases when the degree to which a person engages in materialism increases.*

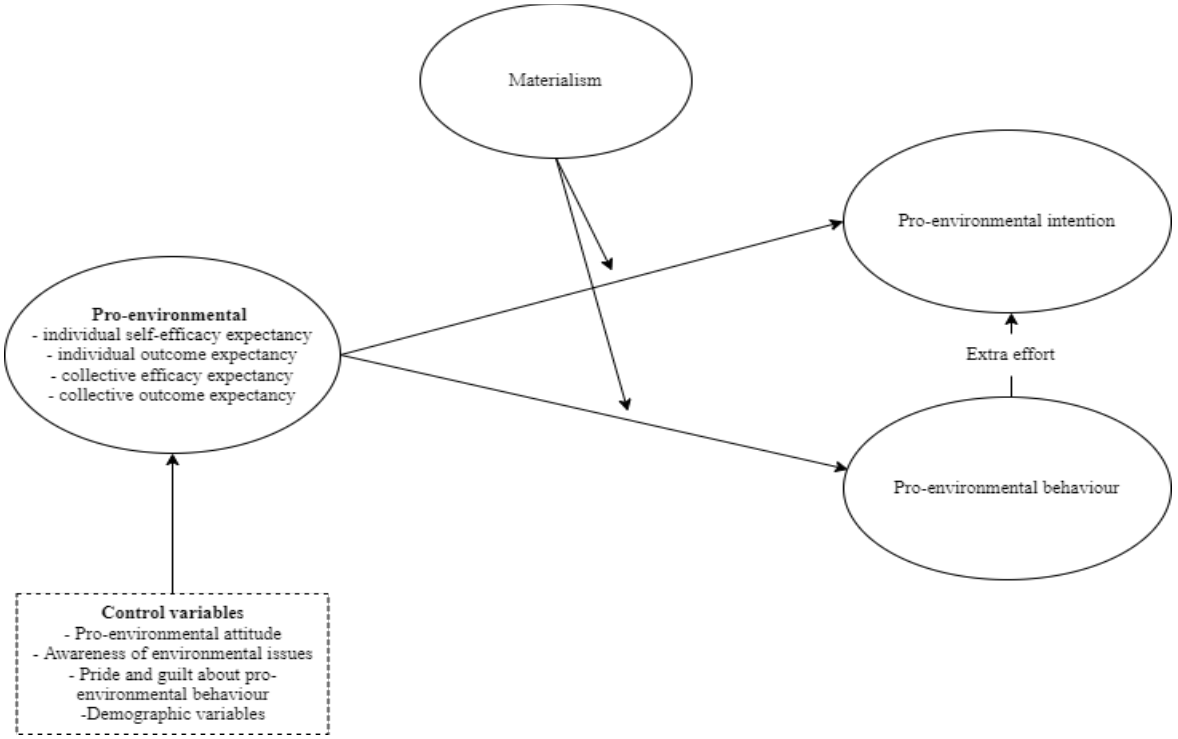

Fig. 1. Conceptual model.

2.7 Control variables

In this research, three different control variables and demographics are used. Control variables are variables that are held constant or limited during the study. These variables are not of interest for this research; however, they have to be controlled as they could influence the outcomes. These control variables will improve the study's internal validity by limiting the influence of confounding variables and other extraneous variables. The variables used in this research are pro-environmental attitudes, awareness of the environmental issue, pride and guilt of environmental behaviour, and demographic variables.

2.7.1 Pro-environmental attitudes

Pro-environmental attitudes are essential to consider as they frequently determine behaviour. This behaviour will increase or decrease environmental quality (Gifford & Sussman, 2012). Furthermore, it was concluded that pro-environmental attitudes contribute to developing PEB (Duarte et al., 2017). Additionally, prior research revealed that people with high environmental attitudes usually engage in PEB (Kollmus & Aygeman, 2002; Fielding & Head, 2011; Chen et al., 2011). Furthermore, environmental attitudes will influence PEB via a chain of causality, including awareness of consequences, personal norms and personal accountability value-belief-norm theory (Stern, 2000). This indicates that pro-environmental attitudes are a central motivation for customers to perform PEB.

2.7.2 Awareness of environmental issues

Awareness of environmental issues triggers the development of positive attitudes and affection towards PEB (Karatekin, 2014). Furthermore, the higher this person’s awareness of these issues, the higher PEI will be. Furthermore, it is discovered that awareness of behavioural consequences effects individual but not public behaviour (Liobikienė & Poškus, 2019). Despite not being a direct predictor of PEB, researchers have used environmental concern to explain PEB (Bamberg, 2003; De Groot & Steg, 2008). Awareness of the environmental issues will be added to this thesis as a control variable as it is a general antecedent of behaviour. The thesis would be limited in generalisability by not including awareness of environmental issues.

2.7.3 Pride and guilt about environmental behaviour

The last control variable used in the conceptual model is pride and guilt about environmental behaviour. PEB is related to feelings of pride and remorse, which impact behaviour (Bissing-Olson et al., 2015). Self-conscious emotions, such as pride and guilt, are rooted in an

individual's behaviour (Tangney et al., 2007). These behaviour assessments are based on their norms of what is good and wrong (Tangney et al., 2007; Tracy & Robins, 2007). Moreover, the research found that PEB was influenced positively by pride and negatively by guilt (Bissing-Olson et al., 2015). Therefore, using these emotions as a control variable will be wise as they affect the relationship under investigation.

2.7.4 Demographic variables

Other demographic variables, such as age, gender, education, occupation, nationality, income, proficiency in English and household composition, were included as control variables as they are expected to impact the relationship between pro-environmental self-efficacy and PEI and PEB. An example would be that people with a higher income could engage in more materialistic behaviours, which could cause them to behave less environmentally friendly. See Appendix B for a more detailed description of these variables.

2.8 Extra effort

In this research, the investigation on PEI will be extended a little as it also aims to investigate "extra" effort on people that already engage in PEB. The question is whether people in the sample who actively engage in PEB also want to do more to increase their behaviour. This will be discussed in the analysis to see whether the people in the sample size either want to do more or feel like what they are doing is already sufficient.

3. Methodology

3.1 Participants and procedure

A large-scale quantitative research method (pre-structured online questionnaire) has been used to test the hypotheses. It was decided to conduct a pre-structured online questionnaire to measure individual attitudes and orientations for a large sample size (Babbie, 1995). Furthermore, the benefit of a questionnaire is that it is an appropriate tool for gaining insights into buying behaviour (Patwardhan et al., 2010). Therefore, it can capture the nature of these behaviours and the extent to which these intentions and behaviours are environmentally friendly (Lange & DeWitte, 2019). The social media channels on which the questionnaire has been distributed included LinkedIn, Facebook, WhatsApp and Instagram within the researcher's network. To achieve the largest sample possible, a combination of convenience sampling and snowball sampling has been used. Respondents have been recruited by requesting friends and family to forward the online survey to their contacts. This strategy of publicly publicising the link and allowing people to share it is advantageous for this thesis since it will include diverse responses. To increase the likelihood of identifying highly materialistic participants, acquaintances have been asked if they knew anyone who values materialism excessively. When asking acquaintances, it is crucial to phrase without judgment. If contacts knew someone that fits this description, the survey was sent.

3.2 Research design

Respondents received a self-administered online survey in a mobile or desktop form, sent via a link to the survey on Qualtrics. The survey was pre-tested by three people to check for ambiguities. This pre-test captured a few minor ambiguities that were adjusted accordingly. The questionnaire structure was as follows: the survey started with an introduction indicating the time it takes to complete the survey. It has been explicitly stated that participation is voluntary, that the questionnaire can be terminated at any time and that the anonymised data will be handled with care. Then the respondents filled in a questionnaire that measured the dependent variables.

The survey started with measuring the concepts of both pro-environmental individual and pro-environmental collective efficacy. These types of efficacy have been subdivided into the following:

The first five questions of the survey measured *pro-environmental self-efficacy expectancy*. Pro-environmental self-efficacy expectancy was measured using Bandura's scale, which

guided the construction of realm-specific self-efficacy scales. Bandura's self-efficacy scale was used in this research but was limited to five items. The five situations adapted from Bandura's self-efficacy scale resembled the following:

- "I have the ability and the capacity to engage in environment-friendly behaviour.
- "I know what behaviour to perform to live in an environmental-friendly way."

The five situations were combined into a mean score to measure average pro-environmental self-efficacy expectancy (α = .951, *M* = 4.71, *SD* = 1.63).

After that, *pro-environmental individual outcome expectancy* was measured using the (revised) Expectancies for Success Scale (Hale et al. 1992) in Physical Education. This research has adopted the same method, but the scale has been adjusted towards environmental issues. The items were similar to the questions used in research on physical education by Xiang et al. (2003). Still, they were adjusted to measure outcome expectancy in the context of sustainability. The respondents were asked to rate six statements based on the slightly modified Expectancies for Success Scale:

- "My environmental-friendly actions contribute to diminishing the climate crisis."
- "I believe that my environmental-friendly actions improve the living conditions on earth.".

The six statements were combined into a mean score to measure average pro-environmental individual outcome expectancy (α = .947, *M* = 4.48, *SD* = 1.60).

Next, five questionnaire items measured *pro-environmental collective efficacy expectancy*. The first two items were adapted from Homburg and Stolberg (2006). The last three items were adapted from Doran et al. (2015) but adjusted to measure collective efficacy expectancy in PEB. In this research, the statements resembled:

- "Although it may cause inconvenience, we all have the ability of living an environmental-friendly life."
- " The people I know possess the capabilities to execute pro-environmental behaviour."

The five statements were combined into a mean score to measure average pro-environmental collective efficacy expectancy (α = .959, *M* = 4.80 , *SD* = 1.70).

Finally, regarding *pro-environmental collective outcome expectancy,* scales are relatively limited. However, a study by Carrico and Riemer (2011) has studied outcome expectancy before the start of this research. This research used their scale combined with statements for pro-environmental individual outcome expectancy using the Expectancies for Success Scale (Hale et al. 1992). Their scale on outcome expectancy has significantly high reliability for individual outcomes. Therefore, this scale was adjusted to measure pro-environmental collective outcome expectancy. Six items were used that resembled the following:

- "If we all set our minds to it, we can mitigate climate change and reduce our global footprint together."
- "No matter what we do, we cannot fight climate change."

The six statements were combined into a mean score to measure average pro-environmental collective outcome expectancy (α = . 945, *M* = 4.85, *SD* = 1.61).

Respondents were requested to answer all statements on the different types of pro-environmental self-efficacy on a 7-point rating scale ranging from 1 (strongly disagree) to 7 (strongly agree).

After filling out the questions on pro-environmental individual and collective efficacy, the respondents were asked to rate a few statements on materialism to identify the degree to which our sample engages in materialism. *Materialism* was primarily assessed at a dispositional level utilising Richins and Dawson's (1992) Material Values Scale (MVS). Richin and Dawson's (1992) conception of material values was used in this thesis to investigate materialism as a moderator influencing consumer behaviour. The MVS is split into three subscales: the significance of acquisition in a person's life, as well as beliefs that acquisition leads to pleasure and indicators of success. In this thesis, the MVS-scale was shortened, and the items consisted of six items (two per dimension). The six items were taken from the original MVS-scale by Richin & Dawson (1992) and resembled the following:

- "I admire people who own expensive homes, clothes, and other items (success)."
- "I would be happier if I could afford to buy more things (happiness)."
- "Buying things gives me a lot of pleasure (centrality)."

The six statements were combined into a mean score to measure average materialism (α = .884, *M* = 3.49, *SD* = 1.43).

The questions on materialism were also measured on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

After that, participants were asked to indicate their PEI as well as their PEB. *PEI* was captured using six items from the Green Behaviour Intention Scale by Mancha et al. (2014). However, in this part, a few items on extra effort were also included to measure the extent to which people who already engage in PEB also intend to do more. The items were similar to the following:

- "My intentions to put extra effort (as compared to what I already do) into abstaining from plastic while shopping are:"
- "My effort in performing sustainable behaviour is already high enough."

The six statements were combined into a mean score to measure average pro-environmental individual outcome expectancy (α = . 923, M = 4.15, SD = 1.63).

Pro-environmental behaviour was measured based on a 30-item scale adapted from the General Ecological Behaviour scale by Kaiser (1998). In this thesis, the study was limited to five items. This scale consists of different statements regarding sustainability behaviour that resembled:

- "I use public transport instead of my car, whenever possible."
- "I have been making adjustments to my household to make it more energy and water efficient."

The five items were combined into a mean score to measure average PEB (α = . 883, M = 4.07 , SD = 1.77).

The respondents were asked to rate the likelihood of PEI (four items) on a 7-point semantic differential scale ranging from 1 (low) to 7 (high), and the remaining two items ranged from 1 (false) to 7 (true). Furthermore, PEB was also measured on a 7-point semantic differential scale ranging from 1 (never) to 7 (always).

Additional related variables were collected to better understand the relationship between pro-environmental self-efficacy and PEB. The consequences of environmental attitudes, awareness of environmental issues and pride and guilt about PEB were measured in this research.

Pro-environmental attitudes was measured by including three items adapted from Lavelle et al. (2015), covering respondents' willingness to conduct specific actions to protect the environment. The statements were similar to the following:

- "I would be willing to sacrifice some personal comforts to save energy."
- "I would be willing to pay higher prices for goods and services if it helped protect the environment."

The three statements were combined into a mean score to measure average pro-environmental attitudes (α = .921, *M* = 4.61, *SD* = 1.62). These statements were also answered based on a 7-point Likert scale ranging from 1 (strongly agree) to 7 (strongly disagree).

The (updated) New Environmental Paradigm Scale was used to assess environmental awareness (Dunlap et al., 2000). The revised NEP scale has 15 items with three items addressing each of the five aspects: the reality of growth limits, anti-anthropocentrism, the instability of the balance of nature, the possibility of an environmental crisis and the rejection of exemptionalism (Dunlap et al., 2000). In this study, four items from this scale were borrowed and utilised to assess environmental awareness, and they looked like this:

- "Nature's balance is extremely fragile and easily disrupted."
- "The so-called "ecological disaster" that humanity is experiencing has been way overstated."

The four statements were combined into a mean score to measure average environmental awareness (α = . 870, *M* = 5.01, *SD* = 1.50).

Pride and guilt about environmental behaviour was measured by The State Shame and Guilt Scale (Marschall, Sanftner, & Tangney, 1994). To analyse each emotion, five emotions per "type" were used:

- **Pride**: "proud", "accomplished", "confident", "satisfied", and "worthwhile"
- **Guilt:** "guilty" "remorseful", "sorry", "bad", and "ashamed"

The respondents were asked to rate how they experienced each emotion category about their environmental behaviour. These emotions were measured on a 7-point Likert scale ranging from 1 (not at all) to 7 (a lot).

The first five emotion items based on pride related to buying behaviour were combined into a mean score to measure average pride about PEB during buying behaviour (α =.911, *M* = 3.37,

SD = 1.76). The other five pride emotion items based on general PEB were combined into a mean score to measure average pride about general PEB (α = . 917, *M* = 2.92, *SD* = 1.63). The five emotions related to guilt about PEB during buying behaviour were combined into a mean score to measure average guilt about PEB related to buying behaviour (α =.882, *M* = 3.30, SD = 1.77). The last five emotions related to guilt about general PEB were combined into a mean score to measure average guilt about general PEB (α = .898, *M* = 4.71, SD = 1.63)

At the end of the survey, some socio-demographic questions were asked, such as age, gender, education, occupation, income, proficiency in English, nationality and household composition. See Table A1 for a complete list of measures.

Table 1.

Methodology

Items	**Variable**	**Source**
5: 1-5	Pro-environmental self-efficacy expectancy	Bandura (2006)
5: 6-11	Pro-environmental individual outcome expectancy	Hale et al. (1992)
3: 12-16	Pro-environmental collective efficacy expectancy	Homburg & Stolberg (2006); Doran et al. (2015)
5: 17-22	Pro-environmental collective outcome expectancy	Hale et al. (1992); Carrico & Riemer (2011)
6: 23-28	Materialism	Richins & Dawson (1992)
5: 29-34	Pro-environmental intention	Mancha et al. (2014)
5: 35-39	Pro-environmental behaviours	Kaiser (1998)
3: 40-42	Pro-environmental attitudes	Lavelle et al. (2015)
3: 43-46	Awareness of environmental issues	Dunlap et al. (2000)
3: 47-66	Pride and guilt about environmental behaviour	Marschall et al. (1994)
6: 67-74	Demographic variables	

3.2.1 Population and sample

This population for this thesis can be found in all social classes, education levels, genders, etcetera. Consequently, there are almost no limitations to who the population should consist of. The only limit is that the participant is above 18 years of age (*M* = 30,45). These requirements will ensure that the participant makes their own (buying) decisions and, therefore, can be exposed to materialism and PEI and PEB.

The sample consisted of 343 participants, of which 36 were removed due to missing data and underage respondents, leaving us with a number of 307 valid respondents. The demographic composition can be found in Table 3 below.

Table 2.

Demographics (n = 307)

	N	**%**		***N***	**%**
Gender			**Children**		
Female	176	57	No	177	57.7
Male	131	43	Yes	160	42.3
Nationality			**Occupation**		
Dutch	280	91.2	Student	71	23.1
Another European background		7.5	Working	220	71.7
Bosnian	4		Volunteer	2	.7
British	3		Non-working	8	2.6
Croatian	2		Retired	2	.7
French	3		Other/I Would rather not say	4	1.3
German	2				
Irish	1				
Kurdish	2				
Latvian	1				
Luxembourgish	1				
Spanish	3				
Turkish	1				
Russian	1				
Other		1.3			
American	2				
Educational level			**Monthly income**		
Primary education	1	0.3	Less than 1.000	47	15.3
Secondary education	21	6.8	Between 1.000 and 2.500	127	41.4
Vocational training (MBO)	74	24.1	Between 2.501 and 5.000	95	30.9
	N	***%***		***N***	***%***
University of Applied Sciences (HBO)	66	21.5	5.001 or more	22	7.2
University Bachelor	33	10.7	I would rather not say	15	4.9
University Master	112	36.5			
	M	**SD**			
Age	30.45	10.68			

3.3 Data analysis

The collected data was analysed using the quantitative research procedure multiple regression analysis in SPSS. Descriptive statistics were retrieved from the dataset after processing and cleaning (checking for missing data, confirming assumptions, and so on). Since this thesis intends to measure the relative importance of the variables on PEB, multiple regression analysis did fit best. Multiple regression can be used to examine the impact of numerous independent factors on one or more dependent variables, which is necessary to answer the thesis' research question (Barkus et al., 2006). As this research aims to understand the impact of multiple types of pro-environmental efficacy on PEI and PEB, the best fitting approach was to use two regression analyses. The first regression analysis analysed the relative importance of pro-environmental efficacy on PEI. The second regression analysis examined the importance of pro-environmental efficacy on PEB. Before interpreting the results, the data was checked for linearity and homoscedasticity. This was done by constructing a scatterplot of residual and expected result values. A histogram and the P-P Plot ensure that the data is normal (Field, 2013).

3.4 Reliability and validity

The accuracy and consistency of the analysis determine the research's reliability. The accuracy of the measuring instruments is considered, and the consistency of the results is related to whether the same results are obtained while doing the study under identical conditions. The reliability of this thesis is relatively high because it relies mostly on existing, commonly used metrics for the variables.

A study's validity may be divided into two parts: internal and external validity. Internal validity relates to whether the research assessed what it was supposed to test, whereas external validity focuses on the study's generalisability. Secondly, internal validity is established very well in this research as the respondents report their behaviour as observing is impossible due to time constraints. Due to the quantitative nature of this study, there was a significantly large amount of respondents ($N = 307$), increasing the generalisability of the research and thus the external validity. However, the external validity will be slightly lowered as the questionnaire can be affected by non-response. Non-response errors occur when those who finish the questionnaire consistently differ from those who could not be contacted or declined to participate.

3.5 Research ethics

Regarding the ethical aspect of this research, some precautions will be taken. In this thesis, the marketing-specific approach by Alsmadi (2008) will be used to ensure that the survey is ethical. The marketing-specific method by Alsmadi (2008) consists of four pillars:

(1) **Informed consent.** The participants will be informed thoroughly about the study they are about to participate in, and they will be notified of the author of the thesis and for what purpose the study is used.

(2) Privacy and confidentiality. The data will only be used for this study and will not be further shared.

(3) Deception and harm. Before starting the questionnaire, it was explicitly stated that participation was entirely voluntary, that the questionnaire could be terminated, and that the anonymised data would be handled with care.

(4) Statement of individual research ethics. According to the researcher's research ethics, the study has been developed and considered with utmost care.

4. Data Analysis

4.1 Data preparation

The first step in conducting the analyses is to check for inconsistencies and missing data in the sample and correct them. The total number of respondents that filled in the survey counts 343 in total. Of these 343 respondents, 36 were removed due to missing data (34, more than four missing answers) and underage respondents (2), leaving us with 307 valid respondents. Furthermore, Qualtrics measured the duration of the questionnaire, which provided the researcher with an overview of how long every respondent spent filling in the questionnaire. However, a few respondents spent more than 6 hours on the questionnaire; these respondents should be deleted as they most likely did not finish or did not answer with full intention. Furthermore, a few respondents also answered the questionnaire in less than five minutes. These are supposedly not answered accurately as one cannot fill in a survey of 63 items in less than 5 minutes. When investigating these respondents, these were also the ones that had a lot of missings and were already deleted previously. A few were not deleted yet, but they did not show any patterns of random answering and did notice the reversed questions. Therefore it was decided to keep them in the dataset.

The second step for preparing the data is to reverse code the negatively phrased answers to measure all the responses in the same meaningful direction. The items that are recoded are “My environmental-friendly actions have no impact on reducing the climate crisis.”, “Even if we all set our minds to it, we cannot fight climate change.”, “No matter what we do, we cannot fight climate change.”, “If I am offered a plastic bag in a store, I will always take it.”, “I usually buy only the things I need.”, “Humans have the right to alter the natural environment to better suit their needs.” and “The so-called "ecological disaster" that humanity is experiencing has been way overstated.” (see Appendix 1).

Third, as described in chapter three, the four constructs used for the analysis are measured with validated measurement scales from other scholars containing multiple items that measure one construct. To start the analysis, the various items are combined into a new mean score of all the items into the new variable. After that, age was recoded into three groups to get a more precise overview of three groups of the respondents in terms of age (see Table 2 in Methodology section). Furthermore, the control variable “amount of children” was recoded and “no children” was used as the contrast group. For the variable “income”, the category “prefer not to say” was used as a medium-income as keeping it as the highest value in SPSS

would make the data uninterpretable. Medium income was used as this is more or less an average salary, which would fit this item best.

4.2 Reliability

The most well-known approach for confirming the consistency of items measuring a factor is the reliability analysis, with a value known as Cronbach's alpha. Cronbach's alpha must have a critical value of .70 or above (Field, 2013). It was decided not to delete any items as the "Cronbach's alpha if item deleted", as this would not increase the scales. The table below provides an overview of the reliability coefficients of the elements as well as the number of items contained. Each factor's Cronbach's alpha is sufficiently high (>.70) to interpret the items as legitimate measurements of the variable.

Table 3.

Reliability analysis

Scale	No. Items	Cronbach's Alpha (α)
Individual self-efficacy expectancy (pes_eff_exp)	5	.951
Individual outcome efficacy expectancy (pes_outc_exp)	6	.947
Collective self-efficacy expectancy (col_eff_exp)	5	.959
Collective outcome efficacy expectancy (col_outc_exp)	6	.945
Pro-environmental intention (PEI)	6	.923
Pro-environmental behaviour (PEB)	5	.883
Materialism	6	.884
Pro-environmental attitude (attitude)	3	.921
Awareness of pro-environmental behaviour (awareness)	4	.870
Pride about buying behaviour (pride_buying)	5	.911
Guilt about buying behaviour (guilt_buying)	5	.882
Pride about pro-environmental behaviour (pride_behaviour)	5	.917
Guilt about pro-environmental behaviour (guilt_behaviour)	5	.898

Note: Cronbach's Alpha (α) >.70 is sufficient

4.3 Descriptive statistics

4.3.1 Univariate statistics

Investigating the demographic (control) variables reveals how the data is presented. The most important findings include that regarding the age of the respondents, 50% fall into the category 18-25, 31.9% fall into the category of 26-40, and the remaining 17.9% are 41-63 in the dataset. A possible explanation for this distribution is that most respondents are the same age as the researchers and are therefore more easily targeted. Also, the fact there is quite a large amount of people 41 and older would possibly be caused by the fact that the parents of the researchers are to be found in this age group as well as their acquaintances. The majority of the respondents, 58%, do not have children (n = 177), followed by 23% having one child (n = 71). It makes it interesting to see whether having children and future concerns may

influence the way people engage in PEI and PEB. The distribution of the other demographic variables can be found in Table 2 in the Methodology section.

The descriptive statistics for the main variables are mostly positively answered (see Appendix E). Regarding the independent variables, 'col_outc_exp' has the highest mean score, which is 4.85; this lies closest to the value of 5. This indicates that, generally, the respondents score moderately high on collective outcome expectancy. Next, 'pes_outc_exp' has the lowest mean score, which is 4.48; this indicates that, generally, the respondents do not necessarily score high or low on pro-environmental individual outcome expectancy. The other efficacies' mean scores lie in between those two mean scores.

Regarding the dependent variables, the mean score for PEB is 4.03, indicating that, generally, the respondents do not necessarily score high or low on PEB. The mean intention score is 4.2, showing that, generally, the respondents do not necessarily score high or low on PEI but are a bit more on the higher side. The mean score for materialism is 3.49, indicating that, in general, the respondents do score moderately low on materialism.

Regarding the control variables, 'awareness of the environmental issue' has the highest mean score (5.01), indicating that the respondents are generally moderately aware of environmental issues. The control variable "guilt_behaviour' has the highest mean score (4.71); this might indicate that people might have feelings of guilt when not performing PEB. The other emotions score relatively low in this sample.

Table 4.

Means of scales and use of scale (n = 307)

	Mean	SD	Minimum	Maximum
Pes_eff_exp	4.71	1.63	1.20	7.00
Pes_outc_exp	4.48	1.60	1.00	7.00
Col_eff_exp	4.80	1.70	1.00	7.00
Col_outc_exp	4.85	1.61	1.33	7.00
PEB	4.07	1.77	1.00	7.00
PEI	4.15	1.63	1.00	6.67
Materialism	3.49	1.43	1.00	6.33
Attitude	4.61	1.62	1.00	7.00
Awareness	5.01	1.50	1.25	7.00
Pride_buying	3.37	1.76	1.00	7.00
Guilt_buying	3.30	1.77	1.00	7.00
Pride_behaviour	2.92	1.63	1.00	7.00
Guilt_behaviour	4.71	1.63	1.20	7.00

4.3.2 Bivariate statistics

Starting with the independent variables, it can be seen that they have very high relationships. This is not surprising as they measure similar constructs, which are different types of self-efficacy. Furthermore, the independent variables pes_eff_exp, pes_outc_exp, col_eff_exp and col_outc_exp also have very strong relationships with both dependent variables intention and PEB (e.g. r = .72, p<.001; r = .77, p<.001). Secondly, the moderator materialism is strongly and negatively related to both PEB and intention (r = -.53, p<.001; r = -.495, n = 308, p<.001), and the different types of efficacy are also strongly and negatively related to materialism (e.g. r = -.421, n = 308, p<.001). Furthermore, the control variables attitude and awareness are also strongly related to both the independent variables and the dependent variables (e.g. r = .749, n = 308, p<.001; r = .779, n = 308, p<.001). Furthermore, the dependent variables intention and PEB seem to have the weakest relationship with the control variables income and educational level (e.g. r = .308, n = 308, p<.001; r = .355, n = 308, p<.001). Due to the high correlations, it is required to be very cautious of multicollinearity in this sample; this will be further discussed in the assumptions for the regression analysis. Appendix C includes table C2, which describes the bivariate statistics of each variable's association.

4.3.3 Materialism descriptive statistics

Regarding the relationship investigated in this research, it is exciting to uncover the degree to which the sample engages in materialism. As previously mentioned, the mean score of materialistic values is 3.49, indicating that the value lies between “neither agree nor disagree” and “somewhat disagree”. Therefore, this sample, in general, scores moderately low on materialism. Next, the different control variables were examined with the moderator materialism to see what groups engaged in materialism the most in this sample. The recoded item age3 shows that the youngest group, 18-25, scores the highest on materialism (M = 3.94), and the oldest group, 41-63, scores the lowest on materialism (M = 2.80). Regarding gender, the male respondents show the highest level of materialism (M = 3.77) compared to the females (M = 3.12). When looking at the different income levels, the respondents that have the second-lowest income (between €1.000 and €2.500) reported the highest levels of materialism(M = 4.19), followed by the lowest income (less than €1.000) (M = 3.68). The income level here was recoded, and the item “prefer not to say” (15 respondents) was given the value 2.5, as it otherwise will be registered as 5.0, indicating that it is the highest income level. Regarding educational level, people with the lowest academic levels show the highest levels of materialism, starting with Vocational training (MBO) (M = 4.13), followed by

Secondary education (MAVO, HAVO, VWO) (3.73) and University Bachelor (M =3.83) As can be seen in the table, University Bachelor also scores relatively high (M = 3.83) compared to the others. However, the range in this group is a lot lower, ranging only to 5.50, whereas the Vocational training group ranges from 1 to 6.33. Lastly, people with a University Master's score relatively low on materialism (M = 2.75). To conclude, the degree one engages in materialism in this population is the highest among younger people with lower education and income. However, the question remains whether this is valid, as a higher income could also decrease worries and make it easier to afford certain items.

Table 5.

Descriptive statistics Materialism (n = 307)

	Mean	SD	Minimum	Maximum	N
Gender					
Female	3.12	1.30	1.17	6.33	176
Male	3.77	1.47	1.00	6.33	131
Age3					
18-25	3.94	1.41	1.00	6.33	154
26-40	3.19	1.43	1.33	6.33	98
41-63	2.79	1.06	1.17	5.83	55
Income2					
Less than €1.000	3.68	1.23	1.17	5.50	47
Between €1.000 and €2.500	4.19	1.47	1.33	6.33	127
I prefer not to say*	3.48	.67	2.33	4.50	15
Between €2.501 and €5.000	2.71	1.12	1.00	6.00	95
More than €5.001	2.49	.91	1.33	4.67	22
Educational level					
Primary education	4.50		4.50	4.50	1
Secondary education	3.74	.91	2.33	5.50	21
Vocational training (MBO)	4.14	1.68	1.17	6.33	74
University of Applied Sciences (HBO)	3.77	1.30	1.33	6.33	66
University Bachelor	3.83	1.06	1.00	6.33	33
University Master	2.75	1.19	1.00	6.33	112

* Prefer not to say was used as a medium-income as keeping it as the highest value in SPSS would make the data uninterpretable. Medium income was used as this is more or less an average salary which fits this item best.

4.4 Multiple regression (moderation analysis)

As this research aims to understand the impact of multiple types of pro-environmental efficacy on PEI and PEB, the best fitting approach would be to use two regression analyses. The first regression analysis will analyse the relative importance of pro-environmental efficacy on PEI. The second regression analysis will examine the importance of pro-

environmental efficacy on PEB. The moderation variable will then be included in the model, allowing the researcher to assess the impact of a third variable on the link between the dependent and independent variables. Therefore, moderation tests when and under what conditions a specific effect will occur instead of testing for causality between these two variables. Hence, moderators can either strengthen, weaken or shift the relationship.

4.4.1 Assumptions multiple regression analysis

Normality of the error term distribution

The regression residuals should have a normal distribution to allow for accurate inferences from a multiple regression study. When the Predicted Probability (P-P) plot was inspected, the residuals for both dependent variables (intention and PEB) are normally distributed. Furthermore, normally distributed data must have skewness and kurtosis between (-3) and (+3). This was true for all of the variables in the data (see Appendix D1 for a detailed description).

Linearity of the phenomenon measured

Scatter plots are used to test the linearity assumption, in which each independent variable (including the moderator) is plotted against the dependent variable. In conjunction with the dependent, each variable demonstrated a linear connection. As a result, the variables do not need to be modified; instead, they are presumed to be linear.

Constant variance of the error terms (Homoscedasticity)

To check for the following assumption of homoscedasticity, there needs to be no obvious pattern in the scatterplot. When the residuals form a certain pattern (e.g. a diamond or a dot) then the data is heteroscedastic. This is not the case for this population for either of the dependent variables.

Independence of the error terms (multicollinearity)

Lastly, the data was checked for multicollinearity using the VIF values in the Coefficients table. For both dependent variables, the VIF values are below 10, indicating that the assumption is met.

Pride and Guilt about pro-environmental behaviour (sub-population)

Regarding the control variable, pride and guilt about PEB, it was noticed that the data was very much skewed to the left, especially to the value of ‘1’. As this item in the questionnaire was measured based on sliders in which the respondents had to slide the bar to match each emotion felt with a score ranging from 1 to 7, it seems like the respondents might have

clicked the number 1 and continued to the next question. Due to this issue, the question might not be as reliable as it should be. Therefore, a subpopulation was created in which all the respondents that had 1's in their answers were excluded. This left the researcher with a sub-population of 240 respondents that did not answer 1 to the pride and guilt items, and this data was normally distributed. However, neither of the populations had any effect on the dependent variables, and it was decided to discontinue using this control variable in the regression analysis.

4.4.2 Moderation analysis

The researcher utilised a stepwise strategy to check if adding variables enhances the variance explained by the model to interpret the model that describes the link between the predictor, moderator, and dependent variables (Hair et al., 2013). As a result, four models are examined in order to determine the utility of the moderator and control variables. Two regression analyses were done separately as their models have two dependent variables. Subsequently, regarding the first model, the relationship between the control variables (e.g. age3, gender, awareness, attitude, pride_buying, pride_behaviour, guilt_buying, guilt_behaviour, income2, educational_level and children) and the outcome variables (e.g. intention and PEB); after that, in the second model, the different independent/predictor variables were entered to see whether the addition of these variables increases the variance explained by the model. In the third model, the dependent variable materialism was added to the model, and the interaction effects were added to the fourth model. The first model already explains the dependent variable PEB by 62.7% of the variance in the model (R^2 = .627, F(7,298) = 71.47, p<.001), the second model explains 69.7% (R^2 = .697, F(4,294) = 16.97, p<.001), the third model 71.5% (R^2 = .715, F(1,293) = 18.93, p<.001) and the fourth and last model explains 72.4% of the total variance of the dependent variable PEB (R^2 = .724, F(1,292) = 9.82, p<.010). The other first model already explains the dependent variable PEI by 61% of the variance in the model (R^2 = .610, F(7,298) = 66.45, p<.001), the second model explains 70.5% (R^2 = .705, F(4,294) = 23.95, p<.001), the third model 71.2% (R^2 = .712, F(1,293) = 6.39, p<.010) and the last and fourth model explains 73.4% of the total variance of the dependent variable PEI (R^2 = .734, F(1,292) = 24.957, p<.001).

Table 6.

Total variance explained intention

Model	R	R^2	Adjusted R^2	SD Error	F	df1	df2	Sig.	Variables
1	.781	.610	.600	1.03	66.45	7	298	.000	Control variables
2	.840	.705	.694	.90	23.95	4	294	.000	Control variables & efficacies
3	.844	.712	.700	.89	6.39	1	293	.012	Control variables, efficacies & materialism
4	.857	.734	.723	.86	24.96	1	292	.000	Control variables, efficacies, materialism & interaction effects

* Dependent variable: Intention

Table 7.

Total variance explained PEB

Model	R	R^2	Adjusted R^2	SD Error	F	df1	df2	Sig.	Variables
1	.792	.627	.618	1.09	71.47	7	298	.000	Control variables
2	.835	.697	.685	.99	16.97	4	294	.000	Control variables & efficacies
3	.846	.715	.703	.96	18.93	1	293	.000	Control variables, efficacies & materialism
4	.851	.724	.712	.95	9.82	1	292	.002	Control variables, efficacies, materialism & interaction effects

* Dependent variable: PEB

To check for the usability of the model, ANOVA test values were used. When looking at both fourth models they are both usable and significant ($F(1,292) = 24.96$, $p<.001$; $F(1,292) = 9.82$, $p<.010$).

Hypothesis 1a:

"*Pro-environmental self-efficacy expectancy positively influences pro-environmental intention."*. The direct relationship and thus, hypothesis 1a, between "pro-environmental self-efficacy expectancy" and "pro-environmental intention" has a positive effect b=.417, a t-score of 7.24, with a significance level of p<.001. Therefore, we can reject the null hypothesis and accept hypothesis 1a stating that pro-environmental self-efficacy expectancy positively influences PEI.

Hypothesis 1b:

"*Pro-environmental self-efficacy expectancy positively influences pro-environmental behaviour."* The direct relationship and thus, hypothesis 1b, between "pro-environmental self-efficacy expectancy" and "pro-environmental behaviour" has a positive effect b=.409, a t-score of 6.76, with a significance level of p<.001. Therefore, we can reject the null hypothesis and accept hypothesis 1b, stating that pro-environmental self-efficacy expectancy positively influences PEB.

Hypothesis 2a:

"*Pro-environmental individual outcome expectancy positively influences pro-environmental intention."* The direct relationship and thus, hypothesis 2a, between "pro-environmental individual outcome expectancy" and "pro-environmental intention" has a positive effect b=.504, a t-score of 9.56, with a significance level of p<.001. This effect is strong as an increase of 1 of pro-environmental individual outcome expectancy leads to half a point increase in intention. Therefore, we can reject the null hypothesis and accept hypothesis 2a, stating that pro-environmental individual outcome expectancy positively influences PEI.

Hypothesis 2b:

"*Pro-environmental individual outcome expectancy positively influences pro-environmental behaviour."*. The direct relationship and thus, hypothesis 2b, between "pro-environmental individual outcome expectancy" and "pro-environmental behaviour" has a positive effect b=.474, a t-score of 8.20, with a significance level of p<.001. Therefore, we can reject the null hypothesis and accept hypothesis 2b, stating that pro-environmental individual outcome expectancy positively influences PEB.

Hypothesis 3a:

"Pro-environmental collective efficacy expectancy positively influences pro-environmental intention." The direct relationship and thus, hypothesis 3a, between "pro-environmental

collective efficacy expectancy" and "pro-environmental intention" has a positive effect b=.373, a t-score of 6.87, with a significance level of p<.001. Therefore, we can reject the null hypothesis and accept hypothesis 3a, stating that pro-environmental collective efficacy expectancy positively influences PEI.

Hypothesis 3b:

"*Pro-environmental collective outcome expectancy positively influences pro-environmental behaviour."* The direct relationship and thus, hypothesis 3b, between "pro-environmental collective outcome expectancy" and "pro-environmental behaviour" has a positive effect b=.352, a t-score of 6.00, with a significance level of p<.001. Therefore, we can reject the null hypothesis and accept hypothesis 3b, stating that pro-environmental collective efficacy expectancy positively influences PEB.

Hypothesis 4a:

"*Pro-environmental collective outcome expectancy positively influences pro-environmental intention."* The direct relationship and thus, hypothesis 4a, between "pro-environmental collective outcome expectancy" and "pro-environmental intention" has a positive effect b= .324, a t-score of 5.48, with a significance level of p<.001. Therefore, we can reject the null hypothesis and accept hypothesis 4a stating that pro-environmental collective outcome expectancy positively influences PEI.

Hypothesis 4b:

"Pro-environmental collective outcome expectancy positively influences pro-environmental behaviour." The direct relationship and thus, hypothesis 4b, between "pro-environmental collective outcome expectancy" and "pro-environmental behaviour" has a positive effect b= .323, a t-score of 5.11, with a significance level of p<.001. Therefore, we can reject the null hypothesis and accept hypothesis 4b, stating that pro-environmental collective outcome expectancy positively influences PEB.

Hypothesis 2c:

"*The effect of individual outcome expectancy on pro-environmental intention differs considering the degree to which a person engages in materialism."* As seen in hypothesis 2a, the direct effect of "individual outcome expectancy on "pro-environmental intention" is significant (b = .504, t= 9.56, p<.001). After adding the moderator "materialism" to the model, the interaction effect of materialism is significant and negative (b = -.135, t = -4.63,

p<.001). This indicated that the more materialistic a person is, the lower the effect of individual outcome expectancy will be on PEI.

Hypothesis 2d:

"*The effect of individual outcome expectancy on pro-environmental behaviour differs considering the degree to which a person engages in materialism."* As seen in hypothesis 2b, the direct effect of "individual outcome expectancy on "pro-environmental behaviour" is significant (b = .474, t= 8.20, p<.001). After adding the moderator "materialism" to the model, the interaction effect of materialism is significant and negative (b = -.094, t = -2.93, p<.010). This indicated that the more materialistic a person is, the lower the effect of individual outcome expectancy will be on PEI.

Table 8.

Overview testing of hypotheses

Hypothesis	**Accepted?**
H1a. Pro-environmental self-efficacy expectancy positively influences pro-environmental intention.	Yes
H1b. Pro-environmental self-efficacy expectancy positively influences pro-environmental behaviour.	Yes
H2a. Pro-environmental individual outcome expectancy positively influences pro-environmental intention.	Yes
H2b. Pro-environmental individual outcome expectancy positively influences pro-environmental behaviour.	Yes
H3a. Pro-environmental collective efficacy expectancy positively influences pro-environmental intention.	Yes
H3b. Pro-environmental collective efficacy expectancy positively influences pro-environmental behaviour.	Yes
H4a. Pro-environmental collective outcome expectancy positively influences pro-environmental intention.	Yes
H4b. Pro-environmental collective outcome expectancy positively influences pro-environmental behaviour.	Yes
H2c. The effect of individual outcome expectancy on pro-environmental intention decreases when the degree to which a person engages in materialism increases."	Yes
H2d. The effect of individual outcome expectancy on pro-environmental behaviour decreases when the degree to which a person engages in materialism increases."	Yes

Control variables

For testing the control variables, the control variables were jointly put in the first model and also added in the model with the moderation variable in it as well. The relationship between the independent-, moderator-, and dependent variables is only significantly controlled for 'attitude' ($b = .307$, $t = 5.42$, $p<.001$), 'income' ($b = .272$, $t = 3.32$, $p<.01$), 'educational level' ($b = .123$, $t = 2.61$, $p<.05$) and 'age' ($b = .016$, $t = 2.34$, $p<.05$) for the dependent variable 'intention'.

Lastly, the relationship between the independent-, moderator-, and dependent variables is only significantly controlled for 'attitude' ($b = .361$, $t = 5.83$, $p<.001$) and 'educational level' ($b = .247$, $t = 4.81$, $p<.001$) for PEB.

Total effects model

When all models are included in the study, the models demonstrate a considerable improvement in the model (total variance explained 73%). Regarding the dependent variable "intention", the independent variable "pes_outc_exp" is the most important predictor; the other three are not significant anymore. The control variables "attitude", "income", and "educational level" remain significant; however, "age" and "gender" do not have an effect. The moderator "materialism" has a direct negative impact on "intention". Lastly, the interaction effect of materialism (zmat_pes_outc) again has a negative effect on pes_outc_exp, indicating that the more materialistic a person is, the lower the effect of individual outcome expectancy will be on PEI.

Regarding the dependent variable "PEB", all models significantly improve the model (total variance explained 73%). For the dependent variable "PEB", the independent variable "pes_outc_exp" is the most important predictor and is the only independent variable that remains significant. The control variables "attitude" and "educational level" remain significant. Lastly, the interaction effect of materialism (zmat_pes_outc) again has a negative effect on pes_outc_exp, indicating that the more materialistic a person is, the lower the effect of individual outcome expectancy will be on PEB.

Table 9.

Moderation analysis total model (N=307)

	Dependent variables			
	Pro-environmental intention		Pro-environmental behaviour	
	Beta	T (Sig.)	Beta	T (Sig.)
Total effects model				
(Constant)	-1.741 .497	**-3.499** **.001**	-.1.309 .548	**-2.389** **.018**
Pro-environmental self-efficacy expectancy	.107 .084	1.275 .203	.136 .093	1.47 .143
Pro-environmental individual outcome expectancy	.731 .101	**7.217** **.000**	.577 .112	**5.17** **.000**
Pro-environmental collective efficacy expectancy	.124 .080	1.543 .124	.080 .088	.901 .368
Pro-environmental collective outcome expectancy	-.077 .078	-.983 .326	- .040 .086	-.469 .640
Materialism	.288 .092	**3.142** **.002**	.084 .101	.834 .405
Pro-environmental individual outcome expectancy x Materialism (zmat_pes_outc)	-.101 .020	**-4.921** **.000**	-.072 .023	**- 3.187** **.002**
Age3	.017 .006	**-3.499** **.001**	.012 .007	1.689 .092
Female	.115 .104	1.101 .272	.176 .115	1.530 .127
Awareness of the environmental issue	-.069 .062	-1.125 .261	-.079 .068	-1.163 .246
Pro-environmental attitudes	.243 .056	**4.359** **.000**	.293 .062	**4.762** **.000**
Income2	.269 .079	**3.396** **.001**	.127 .087	1.452 .148
Educational level	.106 .045	**2.343** **.020**	.230 .050	**4.616** **.000**
Children	-.229 .136	-1.687 .093	-.128 .150	-.857 .392
Extra interaction effects				
Pro-environmental self-efficacy expectancy x Materialism (zmat_pes_eff)	-.141 .029	**- 4.940** **.001**	- .094 .032	**- 2.976** **.003**
Pro-environmental collective efficacy expectancy x Materialism (zmat_col_eff)	-.146 .027	**-5.424** **.001**	- .102 .030	**- 3.407** **.001**
Pro-environmental collective outcome expectancy x Materialism (zmat_col_outc)	- .155 **.029**	**-5.403** **.001**	-.121 .032	**- 3.831** **.001**

Variables for moderation standardised Net income = household annual income.
Control group for gender: male, age2 and income2 recoded variable; extra interaction effect was tested separately in the model, not in the total model of this .thesis

4.5 Extra effort

The next part of the conceptual model mentions extra effort in PEI. This means that the question is whether people who already engage in PEB also feel the need or intend to put extra effort into performing PEB. To investigate that, intention and behaviour were recoded into two different groups, the first group (0) being the 75% of the respondents that have the lowest score on the dependent variables, and the second group (1) embodies the 25% that have the highest score on the dependent variables. Out of the 96 people that score high on PEB, 78 intend to do even more (extra effort). Also, the correlation between PEB and intention for this group has decreased ($r = .872$, $p < .001$, $N = 307$), but it is still relatively high and significant ($r = .276$, $p < .05$, $N = 78$). To conclude, when the respondents have already performed, a group of people still intends to do more ($N = 78$). However, a group ($N = 21$) believes they already do enough and do not want to put extra effort into performing PEB.

Table 10.

Extra effort descriptives (N = 307)

PEB/Intention	*N*
High PEB/High intention	78
Low PEB/Low intention	189
High PEB/Low intention	18
Low PEB/High intention	22
Total	307

5. Discussion

5.1 Interpretation of results

In this section, the information on the results provided in the previous chapter will be interpreted and explained in chronological order. Therefore, starting with the first hypothesis that proves the direct relationship between "pro-environmental self-efficacy expectancy" and "pro-environmental intention", This relationship was founded to be significant, positive, and moderately strong. This outcome is in line with previous research (Sirios, 2004), where the researchers found that people with lower self-efficacy also showed weaker behavioural intentions. The result is also consistent with the concepts of the Theory of Planned Behaviour (Ajzen, 1985,1991) mentioned previously. However, this accepted hypothesis contrasts with other work on self-efficacy and intentions. Other researchers found that personal or individual self-efficacy only has an effect when these personal actions are part of an efficacious collective movement. When these actions are perceived as more collective behaviour, people may conceive of their actions as affecting environmental crises and may thus intend to act in problem-oriented and pro-environmental ways (Jugert et al., 2016). However, in this thesis, it was found that pro-environmental self-efficacy expectancy does have a direct influence on PEB; however, what is not examined in this relationship is whether collective efficacy will increase pro-environmental self-efficacy expectancy, which might be an exciting idea for other exploratory research. These researchers also found that whereas collective efficacy perceptions increase explicit collective action, collective efficacy must be translated into self-efficacy to affect people's pro-climate actions. Therefore, the results of this thesis contribute clarity to this notion as pro-environmental self-efficacy expectancy has a positive effect on PEI.

The second hypothesis proved the direct relationship between "pro-environmental self-efficacy expectancy" and "pro-environmental behaviour". The relationship between these two variables was significant, positive and moderately strong. The critical relationship is in agreement with other scholars (e.g., Thøgersen & Crompton. 2009; Tabernero & Hernández, 2011 Lanzini & Thøgersen, 2014; Sawitri et al., 2015), which provided empirical evidence that pro-environmental self-efficacy expectancy is a driving force influencing PEB. Also, these researchers found that adolescents with higher levels of pro-environmental self-efficacy expectancy reported more PEB than those with lower levels of self-efficacy (Meinhold & Malkus, 2005; Sawitri et al., 2015). Furthermore, in the research conducted by Meinhold & Malkus (2005), the researchers found that the relationship between attitudes and behaviour

was not moderated by pro-environmental self-efficacy. However, they did find an apparent relationship between adolescent environmental behaviour in the model. Hence, they suggest that self-efficacy could be its independent variable. As tested in this thesis, it was accurate as it has a positive and strong relationship with PEB.

The following two hypotheses proved the direct relationship between pro-environmental individual outcome expectancy and “pro-environmental intention” and “pro-environmental behaviour”. This relationship was found to be significant, positive and significantly substantial. This found relationship is by the work of other researchers in other domains (Zimmerman, 2000; Damush et al., 2001; Lubell, 2002; Williams et al., 2005; Gao et al., 2008; Pornari & Wood, 2010), which also found that positive outcome expectancy increased the different types of behaviour they investigated. Furthermore, it is also in line with previous research on behavioural intentions that discovered that outcome expectancies, self-efficacy and risk awareness are all important determinants of intention (Garcia & Mann, 2003). For instance, it was found that pro-environmental individual outcome expectancy has a significant, favourable and strong influence on behaviour as 'people who believe the environment is unhealthy and that they can do something about it are more likely to express intentions to engage in environmental activism and to act on those intentions' (Lubell, 2002, p. 441), which is by the results of this thesis. This could also be seen in our sample, as our sample scored relatively high on awareness. Pro-environmental individual outcome expectancy scored relatively high and was the most critical predictor of PEI and PEB. However, environmental awareness was not significant throughout the analysis, making the part of ‘people who believe that the environment is unhealthy’ a bit dubious. Furthermore, Heath and Gifford (2006) investigated the function of personal outcome efficacy in behavioural and environmental intentions. They argued that 'it appears that before individuals are ready to act against climate change, they must believe that even a small thing one individual can do will make a meaningful difference' (Heath & Gifford, 2006, p. 64). In the model of this thesis, this was also confirmed regarding the dependent variable “intention”, the independent variable “pes_outc_exp” is the most important predictor, and the other three were not even significant anymore.

However, their findings, as well as the ones of this thesis, conflict with prior research that found little to no association between these two characteristics in young people (e.g. Dzewaltowski, 1989). It may be possible that the young adults in the questionnaire for this thesis valued the outcomes of their behaviours more as it involved the environmental crisis

that impacts everybody, compared to the health and educational aspect of the other research that only affects one's health.

The following two hypotheses proved the collective domain's positive and direct relationship with PEI and PEB. Both relationships between "collective efficacy expectancy" and "pro-environmental intention" and "pro-environmental behaviour" were found to be significant, positive and (moderately) strong. This outcome is by prior research (Bonniface & Henley, 2008; Jugert et al., 2016), which found that collective efficacy positively influences PEB and that the increase of pro-environmental collective efficacy expectancy enhanced customer intentions by establishing efficacy conveyed from the group to the individual (Jugert et al., 2016). These findings imply that when consumers engage as a group, they believe they can better attain their sustainability goals. In this study, however, when all the variables were put in the total effects model, only pro-environmental individual self-efficacy remained significant, indicating that for our sample, the collective aspect is not as crucial as the individual one. Which is a bit odd as one proposed previously, one of the main reasons why a multidimensional approach towards pro-environmental self-efficacy was chosen is because sustainability does not solely depend on individual action but also activities performed by a group.

The following two hypotheses proved the collective domain's positive and direct relationship with PEI and PEB. Both relationships between "collective outcome expectancy" and "pro-environmental intention" and "pro-environmental behaviour" were found to be significant, positive and (moderately) strong. This result is similar to the work of other researchers (Bonniface and Henley, 2008; Joireman et al., 2010; Carriço and Riemer, 2011), who found that collective outcome expectancy is associated with PEB, and it was also found that collective outcome expectancy was associated with intentions to perform mitigation actions (Truelove, 2014). It was suggested that the collective's behaviour influences an outcome that group members seek. Therefore, the collective may push individuals to save more energy through a stronger sense of collective outcome beliefs. This was somehow refuted by the research for this thesis, as pro-environmental individual outcome expectancy and pro-environmental collective outcome expectancy both have a direct effect on PEI and PEB; however, when putting them together in the total effects model, collective outcome expectancy was not significant anymore. The issue of whether collective outcome expectancy or individual outcome expectancy can thus be questioned, as, in our sample, the individual outcome expectancy is the only one that remained significant.

The last two hypotheses indicated that the relationship between pro-environmental individual outcome expectancy and PEI and PEB moderated by materialism was significant and negative but not very strong. This is in line with previous research (Brown & Kasser, 2005; Richins & Dawson, 1992), which discovered that individuals who strongly support materialistic ideals had fewer PEB and larger environmental footprints. Materialism has also been linked to low self-efficacy (Flouri, 2005; Watson, 2014), as people utilise monetary incentives to feel accomplished. This might fail because such goals are either unrealistic or unsatisfactory, resulting in low self-efficacy (Watson, 2014). In this thesis, it was found that materialism hurts the relationship between "pro-environmental individual outcome expectancy" and "pro-environmental intention" and "PEB". This means that people who value materialistic items will indeed have diminished self-efficacy and will have less PEI and perform less PEB. This is also supported by (Sawitri, 2015) as she discovered that the link between objectives and behaviours is stronger under favourable versus non-favourable environmental factors, such as materialism.

In addition, pro-environmental attitudes are highly important and influential on whether somebody will engage in PEB or not. In this thesis, attitudes were significant through the entire analysis for both dependent variables. These findings are in line with previous research on intentions and PEB. Previously, it was found that attitudes will influence PEB via a chain of causality, including awareness of consequences, personal norms and personal accountability value-belief-norm theory (Stern, 2000). Also, in previous research it was found that attitudes towards recycling predicted PEI (Boldero, 1995). This thesis confirms that pro-environmental attitudes are a central motivation for customers to engage in PEI and PEB.

Contrary to research done by Karatekin (2014), awareness of pro-environmental issues was not significant throughout this thesis. The lack of influence of awareness of environmental issues may be diminished by the influence of pro-environmental attitudes. Since people already formed specific attitudes, it can be assumed that awareness of an ecological crisis already exists, therefore; pro-environmental attitudes may diminish the influence of environmental awareness.

The other control variables that were significant throughout the regression analysis include income and educational level. These two are probably a bit intertwined, as usually a higher educational level will ensure a higher net income. Therefore, the economic situation in which people find themselves has an effect on whether they will engage in PEI and PEB. An easy explanation for this would be that people with a higher income, have less worries about

spending money and could more easily make adjustments to their houses, buy organic products etcetera.

The control variables age, gender, amount of children and occupation were non-significant in the analysis, indicating that there are no differences between males and females nor in different age groups. There is also no difference between the occupation of the respondents and whether they have children or not does not have an impact on their PEI and PEB. It was expected that people with children would be inclined to more PEI and PEB as they might have more future concern, however; according to this thesis that is not true.

Lastly, it was found that out of the 96 people that score high on PEB, 78 have the intention to do even more (extra effort). Moreover, the correlation between PEB and intention for this group has decreased, but it is still relatively high and significant. In conclusion, when the respondents already perform PEB, most of the respondents still intend to do more.

5.2 Theoretical contributions

This thesis clarifies the relatively uninvestigated concept of multidimensional pro-environmental self-efficacy since most research uses a straightforward, unidimensional conception of self-efficacy. In the context of sustainability, this one-dimensional approach is insufficient to understand the essence of the relationship between self-efficacy on intentions and PEB. Furthermore, research shows several forms of self-efficacy influence PEB. Adopting a multidimensional approach will better explain the relative effects of these types of self-efficacies. A multiple dimension self-efficacy approach has been used before in the writing domain (Bruning et al., 2013). However, it was not used in the sustainability domain before. Additionally, to the best of our knowledge, this is one of the first studies to investigate the interdependence of several self-efficacy constructs and the moderating influence of materialism on PEI and PEB. It was even investigated as an extra idea whether people who already engage in PEB would still have more intention to put extra effort into increasing their PEB.

The first contribution is that the different types of self-efficacy all have a direct effect on PEI and PEB, which is in line with the work of other researchers (e.g. Sirios, 2004; Bonniface & Henley, 2008; Thøgersen & Crompton. 2009; Tabernero & Hernández, 2011; Sawitri et al., 2015). Therefore, self-efficacy should also be considered a multidimensional construct in the sustainability domain. This multidimensional approach towards self-efficacy suggests further research since this study only used the moderating effect of materialism. However, many

other moderating variables could be explored to see whether they affect the relationship between pro-environmental self-efficacy and PEI and PEB.

The second contribution is that this thesis has added materialism to determine whether engaging in materialistic behaviour impacts the relationship between the multidimensional pro-environmental self-efficacy, PEI and PEB, which was not done previously. This model can be used to investigate or explore other moderators. Materialism in this thesis, had a significant, negative, but small effect on the relationship; hence, other moderators might have a more substantial impact on PEB. Therefore, this thesis can be relevant to academics as it can be a starting point for future research, including a multidimensional approach toward self-efficacy.

Third, as many other scholars mentioned, the different types of self-efficacy are highly similar and complex to distinguish from each other. Especially in formulating questions, this can be tricky. However, this thesis found that once all direct and interaction effects were put together, the immediate effect of pro-environmental individual outcome expectancy remained significant. This shows that these items are probably highly similar. This thesis might encourage other researchers to investigate further the differences between self-efficacy expectancy and outcome expectancy to more clearly distinguish these from each other.

Fourth, when relating this thesis to the theories discussed in the second chapter, this thesis extends the TPB with insights on how customers might develop PEI and PEB in the context of sustainability and taking a multidimensional approach. This thesis showed that the different types of pro-environmental self-efficacy positively impact PEI and PEB. However, regarding the direct and total effects model, the impact on PEI is more significant than on PEB. Therefore, this thesis builds on existing knowledge that emphasises the importance of self-efficacy on intentions and behaviour and separates intentions from behaviour. The results of this thesis can be used to better the intention-behaviour gap mentioned by TPB, as the different types of efficacies had a more substantial impact on PEI than PEB. Therefore, this thesis can be seen as a sort of extension of TPB as the intention-behaviour gap can be explained by the level of different efficacies of customers.

This thesis also builds on existing evidence of the other theory discussed in the second chapter, ToSE. This thesis extends ToSE, showing that the different efficacies and outcome expectancies positively impact PEI and PEB. In addition, this thesis develops ToSE as it includes pro-environmental self-efficacy as a multidimensional construct, using both

collective- and individual efficacies and outcome expectancies. Lastly, this thesis contributed to ToSE as the results showed that the efficacies do not solely impact behaviour. Pro-environmental self-efficacy influences both intention and behaviour and intention play a significant role in this relationship.

5.3 Managerial contributions

This section provides the reader with practical advice for managers, firms, and all other parties engaged in understanding consumer behaviour towards adopting more PEB and how to steer consumers in the direction of performing these types of behaviour. that want to encourage consumers to behave more environmentally friendly. According to the results, the individual outcome expectancies are the most important to consider as they are the most critical predictor of PEI and PEB. Therefore, it might be interesting for managers to focus on the specific outcomes of certain PEB and on why it contributes to generating a more sustainable world to live on. Furthermore, managers might need to educate their employees and customers on the effects and negative sides of materialism to maintain high self-efficacy resulting in more PEI and PEB.

In contrast with what was expected is that according to this thesis, it is more important to improve individual self-efficacy than it is essential to do that as a collective. Therefore, managers should focus on encouraging individuals and on sorting of persuading them to think that it is not only a tiny drip that will have to fill the bucket but to teach them that every single drip is essential to fill the bucket. Furthermore, managers must focus on creating individual capacity judgements to foster the conviction that people can achieve positive results after beginning or carrying out environmental changes, offer supportive contextual circumstances and facilitate goal-setting (Sawitri et al. 2015).. Furthermore, it is important for managers to use the knowledge they have on customers that are, for example, unsure about the outcomes of specific pro-environmental actions (Jackson, 2005). When using this knowledge one can use this uncertainty and portray a solution for the customer and understanding them better.

Additionally, the control variable “environmental attitudes” remained significant throughout the analysis. Therefore, managers need to educate their employees and customers on the consequences of their actions and thus increase their attitudes, which leads to more PEI and PEB. Moreover, since a significant group still intends to do more while already engaging in PEB, it is key to not only focus on people that do not behave environmentally friendly. It is also essential to focus on people already engaging in environmentally friendly behaviour who still want to put extra effort into improving the environment.

Lastly, the societal relevance is that it will also provide customers with a better understanding of how their behaviours are influenced by self-efficacy and help them reach their sustainability goals. Therefore, this research's outcomes give managers and customers critical insights into creating a more sustainable planet for future generations.

5.4 Limitations and recommendations for future research

AsF not all direct impacts of the various categories of self-efficacy remained significant in the total effects model, it may be beneficial to investigate these relationships further. This issue will be mainly because during the EFA; it became clear that there was ambiguity concerning different items in the individual and collective domains. The difference between the items is relatively small, making them hard to distinguish for respondents and SPSS. Therefore, it is recommended for exploratory research to investigate the differences between efficacy expectancy and outcome expectancy, where collective outcome expectancy will be a challenge. Moreover, compared with other research, it is not entirely clear whether pro-environmental individual outcome expectancy or pro-environmental collective outcome expectancy is more important. In this research, they were both critical independently; however, only pro-environmental individual outcome expectancy remained significant when combining them. Therefore, it is recommended for exploratory research to dig deeper into the aspect of pro-environmental individual-and collective outcome expectancy and their influence on PEI and PEB. Moreover, it might be interesting for future research to focus on whether collective efficacies could possibly influence individual efficacies as well, as in this thesis pro-environmental individual outcome expectancy seemed more important than the collective efficacies. Which is a bit odd as one proposed previously, one of the main reasons why a multidimensional approach towards pro-environmental self-efficacy was chosen is because sustainability does not solely depend on individual action but also activities performed by a group. Furthermore, this research focused on PEB in general, which made the items measuring outcome expectancies and efficacy expectancies relatively similar. For future research, it might be helpful to use concrete actions within the items to measure more specific behaviour and their outcomes, to distinguish between the two types of efficacies more. Moreover, it might be interesting for future research to focus on whether collective efficacies could possibly influence individual efficacies as well, as in this thesis pro-environmental individual outcome expectancy seemed more important than the collective efficacies. Furthermore, this research only investigated the moderation effect of materialism on pro-environmental individual outcome expectancy in the entire model. The other efficacies were

only analysed singularly. Therefore, it might be helpful to conduct exploratory research to uncover which efficacies are essential and might even be more critical than pro-environmental individual outcome expectancy. Additionally, the effect of materialism was not as significant as expected, which can be caused by the fact that not a lot of people were present that were materialistic. Regarding future research, it might be interesting to use highly materialistic control groups versus people that are not materialistic, or researchers could explore other moderators that possibly have a more significant influence on PEI and PEB. Lastly, regarding the control variable pride and guilt about PEB, there was a lot of random answering, creating a subpopulation. However, this subpopulation still portrayed no significant results. Regarding this control variable, sliders were used to rate a specific emotion during the performance of PEB. This item was asked at the end of the questionnaire, took very long to complete, and a massive group of the respondents just answered '1' to all emotions, which, of course, is unreliable. This control variable might be exciting to examine for future research. However, the items should be asked differently.

Additionally, the respondents in this thesis were mainly Dutch, which restricts the generalisability of this research if one is interested in what is going on in the world. Since this thesis covers the aspect of sustainability it would be very interesting to know more about other countries as well as the ecological crisis does not only concern the Dutch population. This thesis is therefore, only applicable to Dutch customers as these results cannot be generalised towards other countries.

6. Conclusion

The main goal of this thesis is to solve the research gap , that focuses on the multi-dimensional aspect of pro-environmental self-efficacy and the relative importance the different efficacies have on PEI and PEB, moderated by materialism. This is accomplished by answering the main research question:

"What is the relative importance of the different aspects of pro-environmental self-efficacy on pro-environmental intention and behaviour moderated by materialism ?"

After reading this research question, it is expected that all aspects of pro-environmental self-efficacy will influence PEI and PEB and that materialism will moderate this relationship. The study stated four hypotheses subdivided into 'a' and 'b' due to the two different dependent variables. Two more hypotheses were derived from the literature, including the moderating effect of materialism on the relationship between pro-environmental individual outcome expectancy, PEI and PEB. Similar to what was expected in the hypotheses, all aspects of pro-environmental self-efficacy directly and positively influenced PEI and PEB. The last two hypotheses suggested a relationship between pro-environmental individual outcome expectancy and PEI and PEB moderated by materialism. This hypothesis was also accepted as it was found to be significant, negative, but not very strong. This indicates that the more materialistic a person is, the lower the effect of individual outcome expectancy will be on PEI and PEB. However, when looking at the total effects model, the independent variable individual outcome expectancy is the most important predictor, and the other three are not significant anymore. The control variables "attitude", "income", and "educational level" remain significant; however, "age" and "gender" do not affect the dependent variable "intention". The control variables "attitude" and "educational level" remain significant for the dependent variable "PEB". The educational level of the respondents positively influences PEI and PEB. Lastly, most of the respondents that already performed PEB still intended to do more. It is essential to focus on this group instead of solely on people who do not or are limitedly engaging in PEB.

To answer the research question, the relative importance of the different types of efficacies is that they, regarding the direct effects, are all essential as they are relatively strong predictors. However, pro-environmental individual outcome has the strongest direct effect on PEI and PEB. Furthermore, when examining the total effects model, pro-environmental individual outcome efficacy is the only significant predictor. Therefore, the most important predictor for

PEI and PEB is pro-environmental individual outcome efficacy. Furthermore, the moderator materialism have a significant and negative impact on the relationship between pro-environmental individual outcome expectancy; hence the more materialistic a person is, the greater the negative effect is on pro-environmental outcome efficacy, resulting in lower levels of PEI and PEB. In extension to the main research question, in this sample, most of the respondents that already engage in PEB still intend to put extra effort into improving their behaviour. Lastly, the control variables 'attitudes' and 'educational level' are significant predictors of PEI and PEB and will both positively influence the relationship.

To conclude, this research adds new knowledge to the (relatively) unexplored multidimensional pro-environmental efficacy and its effect on PEI and PEB, moderated by materialism. The importance of clarification is that plenty of research sees self-efficacy as a unidimensional construct. However, they all have different effects on the relationship, and when combining them in a total effects model, only pro-environmental individual outcome expectancy remains significant. This might raise the question of whether the combined relationship might be overstated. On the other hand, the efficacies are highly similar and must be distinguished more in future research. Additionally, the findings confirm the TPB by showing that the impact of pro-environmental self-efficacy is more significant for PEI than PEB. By this, it can be assured that there is an intention-behaviour gap as mentioned by the researchers.

Furthermore, this thesis extends the ToSE by introducing more types of efficacies and outcome expectancies. To understand the implications of these results more thoroughly, it is recommended for future researchers to address whether the different kinds of pro-environmental self-efficacy would still be significant when adding other variables influencing the relationship between pro-environmental self-efficacy, PEI and PEB. Contrary to what was expected, it is more important to improve individual self-efficacy than it is essential to do that as a collective. Furthermore, attitudes and educational level remained highly important. Therefore, managers need to educate their employees and customers on the consequences of their actions and thus increase their attitudes, which leads to more PEI and PEB. When combining this with the pro-environmental individual outcome expectancy aspect, managers must focus on creating individual capacity judgements to foster the conviction that people can achieve positive results after beginning or carrying out environmental changes, offer supportive contextual circumstances and facilitate goal-setting (Sawitri et al. 2015).

References

Abraham, C., Sheeran, P., & Johnston, M. (1998). From health beliefs to self-regulation: Theoretical advances in the psychology of action control. Psychology and Health, 13(4), 569-591.

Aizawa, H., Yoshida, H., & Sakai, S. I. (2008). Current results and future perspectives for Japanese recycling of home electrical appliances. Resources, Conservation and Recycling, 52(12), 1399-1410.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In Action control (pp. 11-39). Springer, Berlin, Heidelberg.

Ajzen, I. (1991). The theory of planned behavior. Organizational behavior and human decision processes, 50(2), 179-211.

Ajzen, I., & Fishbein, M. (1980). Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall.

Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. Journal of experimental social psychology, 22(5), 453-474

Alsmadi, S. (2008). Marketing research ethics: Researcher's obligations toward human subjects. Journal of Academic Ethics, 6(2), 153-160.

Altin, S. V., Finke, I., Kautz-Freimuth, S., & Stock, S. (2014). The evolution of health literacy assessment tools: a systematic review. BMC public health, 14(1), 1-13.

Andersson, D., & Nässén, J. (2016). Should environmentalists be concerned about materialism? An analysis of attitudes, behaviours and greenhouse gas emissions. Journal of Environmental Psychology, 48, 1-11

Auhagen, A. E., & Neuberger, K. (1994). Verantwortung gegenüber der Umwelt: Eine Studie über umweltbewußtes Handeln. Gruppendynamik, 26, 319-332.

Babbie, E. (1995). The practice of social research.(7th). Belmont, CA: Wadsworth.

Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. Journal of environmental psychology, 27(1), 14-25

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behaviour change. Psychological Review, 84, 191–215.

Bandura, A. (1997). Self-efficacy: The exercise of control. New York: Freeman.

Bandura, A. (1982). Self-efficacy mechanism in human agency. American psychologist, 37(2), 122.

Bandura, A. (1984). Recycling misconceptions of perceived self-efficacy. Cognitive therapy and research, 8(3), 231-255.

Bandura, A. (1986). Fearful expectations and avoidant actions as coeffects of perceived self-inefficacy.

Bandura, A. (2000). Exercise of human agency through collective efficacy. Current directions in psychological science, 9(3), 75-78.

Bandura, A. (2002). Social cognitive theory in cultural context. Applied psychology, 51(2), 269-290.

Bandura, A. (2006a). Adolescent development from an agentic perspective. Self-efficacy beliefs of adolescents, 5(1-43).

Bandura, A. (2006b). Guide for constructing self-efficacy scales. In F. Pajares & C. Urdan (Eds.), Self-efficacy beliefs of adolescents (Vol. 5, pp. 307–337). New York: Information Age Publishing.

Bandura, A. (2012). On the functional properties of perceived self-efficacy revisited. Journal of Management, 38, 9–44.

Bamberg, S. (2003). How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. Journal of environmental psychology, 23(1), 21-32.

Barkus, E., Yavorsky, C., & Foster, J. (2006). Understanding and Using Advanced Statistics. Faculty of Health & Behavioural Sciences-Papers, 393.

Barr, S., Ford, N. J., & Gilg, A. W. (2003). Attitudes towards recycling household waste in Exeter, Devon: quantitative and qualitative approaches. Local Environment, 8(4), 407-421.

Bauer, M. A., Wilkie, J. E., Kim, J. K., & Bodenhausen, G. V. (2012). Cuing consumerism: Situational materialism undermines personal and social well-being. Psychological science, 23(5), 517-523.

Berardi, U. (2017). A cross-country comparison of the building energy consumptions and their trends. Resources, Conservation and Recycling, 123, 230-241.

Bissing-Olson, M. J., Fielding, K. S., & Iyer, A. (2016). Experiences of pride, not guilt, predict pro-environmental behavior when pro-environmental descriptive norms are more positive. Journal of Environmental Psychology, 45, 145-153.

Blok, V., Wesselink, R., Studynka, O., & Kemp, R. (2015). Encouraging sustainability in the workplace: A survey on the pro-environmental behaviour of university employees. Journal of cleaner production, 106, 55-67.

Bockarjova, M., & Steg, L. (2014). Can Protection Motivation Theory predict pro-environmental behavior? Explaining the adoption of electric vehicles in the Netherlands. Global environmental change, 28, 276-288.

Boldero, J. (1995). The prediction of household recycling of newspapers: The role of attitudes, intentions, and situational factors 1. Journal of Applied Social Psychology, 25(5), 440-462.

Bonniface, L., & Henley, N. (2008). ‘A drop in the bucket ‘: Collective efficacy perceptions and environmental behaviour. Australian Journal of Social Issues, 43(3), 345-358.

Brown, K. W., & Kasser, T. (2005). Are psychological and ecological well-being compatible? The role of values, mindfulness, and lifestyle. Social indicators research, 74(2), 349-368.

Bruning, R., Dempsey, M., Kauffman, D. F., McKim, C., & Zumbrunn, S. (2013). Examining dimensions of self-efficacy for writing. Journal of educational psychology, 105(1), 25.

Carfora, V., Caso, D., Sparks, P., & Conner, M. (2017). Moderating effects of pro-environmental self-identity on pro-environmental intentions and behaviour: A multi-behaviour study. Journal of environmental psychology, 53, 92-99.

Carrico, A. R., & Riemer, M. (2011). Motivating energy conservation in the workplace: An evaluation of the use of group-level feedback and peer education. Journal of environmental psychology, 31(1), 1-13.

Cervone, D. (2000). Thinking about self-efficacy. Behavior modification, 24(1), 30-56.

Chan, K., & Zhang, C. (2007). Living in a celebrity-mediated social world: the Chinese experience. Young Consumers.

Chen, X.D., M.N. Peterson, V. Hull, C.T. Lu, G.D. Lee, D.Y. Hong, and J.G. Liu. (2011). Effects of attitudinal and sociodemographic factors on pro-environmental behaviour in urban China. Environmental Conservation 38: 45–52.

Chen, M.-F. (2015). Self-efficacy or collective efficacy within the cognitive theory of stress model: Which more effectively explains people's self-reported proenvironmental behavior? Journal of Environmental Psychology, 42, 66–75. doi: 10.1016/j.jenvp.2015.02.002

Clayton, S., Litchfield, C., & Geller, E. S. (2013). Psychological science, conservation, and environmental sustainability. Frontiers in Ecology and the Environment, 11(7), 377-382.

Damush, T. M., Stump, T. E., Saporito, A., & Clark, D. O. (2001). Predictors of older primary care patients' participation in a submaximal exercise test and a supervised, low-impact exercise class. Preventive medicine, 33(5), 485-494.

De Groot, J. I., & Steg, L. (2008). Value orientations to explain beliefs related to environmental significant behavior: How to measure egoistic, altruistic, and biospheric value orientations. Environment and behavior, 40(3), 330-354.

De Groot, J. I., & Steg, L. (2010). Relationships between value orientations, self-determined motivational types and pro-environmental behavioural intentions. Journal of Environmental Psychology, 30(4), 368-378.

Doran, R., Hanss, D., & Larsen, S. (2015). Attitudes, efficacy beliefs, and willingness to pay for environmental protection when travelling. Tourism and Hospitality Research, 15(4), 281–292. https://doi.org/10.1177/1467358415580360

Duarte, R., Escario, J.J., Sanagustín, M.V., 2017. The influence of the family, the school, and the group on the environmental attitudes of European students. Environ. Educ. Res. 1, 23-42.

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). Measuring endorsement of the new environmental paradigm: A revised NEP scale. Journal of Social Issues, 56, 425–442.

Dweck, C. S. (2000). Self-theories: Their role in motivation, personality, and development. New York: Psychology Press.

Dweck, C. S., & Elliott-Moskwa, E. S. (2010). Self-Theories: The roots of defensiveness. In J. E. Maddux & J. P. Tangney. (Eds.), Social psychological foundations of clinical psychology (pp. 136–156). New York: Guilford.

Dzewaltowski, D. A. (1989). Toward a model of exercise motivation. Journal of sport and exercise psychology, 11(3), 251-269.

Ellen, P. S., Wiener, J. L., & Cobb-Walgren, C. (1991). The Role of Perceived Consumer Effectiveness in Motivating Environmentally Conscious Behaviors. Journal of Public Policy & Marketing, 10(2), 102–117. https://doi.org/10.1177/074391569101000206

Eriksson, L., Friman, M., & Gärling, T. (2008). Stated reasons for reducing work-commute by car. Transportation Research Part F: Traffic Psychology and Behaviour, 11(6), 427-433.

Field, A. (2013). Discovering statistics using IBM SPSS statistics. sage.

Fielding, K. S., & Head, B. W. (2012). Determinants of young Australians' environmental actions: The role of responsibility attributions, locus of control, knowledge and attitudes. Environmental Education Research, 18(2), 171-186.

Fischer, J., et al. (2012). Human behavior and sustainability. Frontiers in Ecology and the Environment, 10, 153–160.

Fishbein, M. & Ajzen, I. (1975). Belief, attitude, intention and behaviour: An introduction to theory and research.

Flouri, E. (2005). Fathering and child outcomes. John Wiley & Sons.

Fuhrmann, A. , & Kuhl, J. (1998). Maintaining a healthy diet: Effects of personality and self-reward versus self-punishment on commitment to and enactment of self-chosen and assigned goals. *Psychology & Health, 13*(4), 651-686. https://doi.org/10.1080/08870449808407423

Gao, Z., Xiang, P., Lee, A. M., & Harrison Jr, L. (2008). Self-efficacy and outcome expectancy in beginning weight training class: Their relations to students' behavioral intention and actual behavior. Research Quarterly for Exercise and Sport, 79(1), 92-100.

Garcia, K., & Mann, T. (2003). From 'I wish'to 'I will': Social-cognitive predictors of behavioral intentions. Journal of health psychology, 8(3), 347-360.

Gardner, G. T., & Stern, P. C. (2002). Environmental problems and human behaviour (2nd ed.). Boston, MA: Pearson Custom Publishing

Gifford, R. (2011). The dragons of inaction: psychological barriers that limit climate change mitigation and adaptation. American psychologist, 66(4), 290

Gifford, R., & Sussman, R. (2012). Environmental attitudes. In S. D. Clayton (Ed.), *The Oxford handbook of environmental and conservation psychology* (pp. 65–80). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199733026.013.0004

Gleim, M. R., Smith, J. S., Andrews, D., & Cronin Jr, J. J. (2013). Against the green: A multi-method examination of the barriers to green consumption. Journal of retailing, 89(1), 44-61.

Hadler, M., & Haller, M. (2011). Global activism and nationally driven recycling: The influence of world society and national contexts on public and private environmental behavior. International Sociology, 26(3), 315-345.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). Multivariate Data Analysis (7th ed.). Pearson Education Limited

Hale, W. D., Fiedler, L. R., & Cochran, C. D. (1992). The revised generalized expectancy for success scale: A validity and reliability study. Journal of Clinical Psychology, 48(4), 517-521.

Hannah, S. T., Avolio, B. J., Walumbwa, F. O., & Chan, A. (2012). Leader self and means efficacy: A multi-component approach. Organizational Behavior and Human Decision Processes, 118(2), 143-161

Hedlund-de Witt, A., De Boer, J., & Boersema, J. J. (2014). Exploring inner and outer worlds: A quantitative study of worldviews, environmental attitudes, and sustainable lifestyles. Journal of environmental psychology, 37, 40-54.

Hipp J. R. (2016). Collective efficacy: How is it conceptualized, how is it measured, and does it really matter for understanding perceived neighborhood crime and disorder?. Journal of criminal justice, 46, 32–44. https://doi.org/10.1016/j.jcrimjus.2016.02.016.

Hirsh, J. B., & Dolderman, D. (2007). Personality predictors of consumerism and environmentalism: A preliminary study. Personality and individual differences, 43(6), 1583-1593.

Homburg, A., & Stolberg, A. (2006). Explaining pro-environmental behavior with a cognitive theory of stress. Journal of Environmental Psychology, 26(1), 1–14. doi:10.1016/j.jenvp.2006.03.003

Hutchinson, J. C., Sherman, T., Martinovic, N., & Tenenbaum, G. (2008). The effect of manipulated self-efficacy on perceived and sustained effort. Journal of Applied Sport Psychology, 20(4), 457-472.

Inoue, Y., & Alfaro-Barrantes, P. (2015). Pro-environmental behavior in the workplace: A review of empirical studies and directions for future research. Business and Society Review, 120(1), 137-160.

Jackson, T. (2005). Live better by consuming less?: is there a "double dividend" in sustainable consumption?. Journal of Industrial Ecology, 9(1-2), 19-36.

Joireman, J., Truelove, H. B., & Duell, B. (2010). Effect of outdoor temperature, heat primes and anchoring on belief in global warming. Journal of Environmental Psychology, 30(4), 358-367.

Joung, H. M. (2013). Materialism and clothing post-purchase behaviors. Journal of consumer marketing.

Jugert, P., Greenaway, K. H., Barth, M., Büchner, R., Eisentraut, S., & Fritsche, I. (2016). Collective efficacy increases pro-environmental intentions through increasing self-efficacy. Journal of Environmental Psychology, 48, 12-23.

Kaiser, F. G. (1998). A general measure of ecological behavior 1. Journal of applied social psychology, 28(5), 395-422.

Kaiser, F. G., & Gutscher, H. (2003). The proposition of a general version of the theory of planned behavior: Predicting ecological behavior 1. Journal of applied social psychology, 33(3), 586-603.

Karatekin, K. (2014). Social Studies Pre-service Teachers' Awareness of Solid Waste and Recycling. Procedia - Social and Behavioral Sciences, 116(0), 1797-1801.

Kashdan, T. B., & Breen, W. E. (2007). Materialism and diminished well–being: Experiential avoidance as a mediating mechanism. Journal of social and clinical psychology, 26(5), 521-539.

Kasser, T., & Ahuvia, A. (2002). Materialistic values and well-being in business students. European journal of social psychology, 32(1), 137-146.

Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: correlates of financial success as a central life aspiration. Journal of personality and social psychology, 65(2), 410.

Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. Personality and social psychology bulletin, 22(3), 280-287.

Kasser, T. (2002). Sketches for a self-determination theory of values. Handbook of self-determination research, 123, 40.

Kasser, T. (2016). Materialistic values and goals. Annual review of psychology, 67, 489-514.

Klöckner, C. A., & Oppedal, I. O. (2011). General vs. domain specific recycling behaviour—Applying a multilevel comprehensive action determination model to recycling in Norwegian student homes. Resources, Conservation and Recycling, 55(4), 463-471.

Koletsou, A., & Mancy, R. (2011). Which efficacy constructs for large-scale social dilemma problems? Individual and collective forms of efficacy and outcome expectancies in the context of climate change mitigation. Risk Management, 13(4), 184-208.

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior?. Environmental education research, 8(3), 239-260.

Kuhl, J., & Fuhrmann, A. (1998). Decomposing self-regulation and self-control: The volitional components inventory.

Lam, S. (2006), Predicting intention to save water: Theory of planned behavior, response efficacy, vulnerability, and perceived efficiency of alternative solutions, J. Appl. Soc. Psychol. Vol. 36(11), pp. 2803-2824.

Lange, F., & Dewitte, S. (2019). Measuring pro-environmental behavior: Review and recommendations. Journal of Environmental Psychology, 63, 92-100.

Lanzini, P., & Thøgersen, J. (2014). Behavioural spillover in the environmental domain: an intervention study. Journal of Environmental Psychology, 40, 381-390.

Lauren, N., Fielding, K. S., Smith, L., & Louis, W. R. (2016). You did, so you can and you will: Self-efficacy as a mediator of spillover from easy to more difficult pro-environmental behaviour. Journal of Environmental Psychology, 48, 191-199.

Lavelle, M. & Rau, H.& Fahy, F. (2015). Different shades of green? Unpacking habitual and occasional pro-environmental behavior. Global Environmental Change. 35. 368-378. 10.1016/j.gloenvcha.2015.09.021.

Li, D., Zhao, L., Ma, S., Shao, S., & Zhang, L. (2019). What influences an individual's pro-environmental behavior? A literature review. Resources, Conservation and Recycling, 146, 28-34.

Liobikienė, G., & Juknys, R. (2016). The role of values, environmental risk perception, awareness of consequences, and willingness to assume responsibility for environmentally-friendly behaviour: the Lithuanian case. Journal of Cleaner Production, 112, 3413–3422. https://doi.org/10.1016/j.jclepro.2015.10. 049

Liobikienė, G., & Poškus, M. S. (2019). The importance of environmental knowledge for private and public sphere pro-environmental behavior: Modifying the Value-Belief-Norm theory. Sustainability, 11, 3324. https://doi.org/10.3390/su11123324

Locke, E. A., Frederick, E., Lee, C., & Bobko, P. (1984). Effect of self-efficacy, goals, and task strategies on task performance. Journal of applied psychology, 69(2), 241.

Locke, E.A. & Baum, J. (2007). Entrepreneurial Motivation in the Psychology of Entrepreneurship. Lawrence Erlbaum Associates Mahwah. 93-112.

Lubell, M. (2002). Environmental activism as collective action. Environment and Behavior, 34(4), 431-454.

Luszczynska, A., Cao, D. S., Mallach, N., Pietron, K., Mazurkiewicz, M., & Schwarzer, R. (2010). Intentions, planning, and self-efficacy predict physical activity in Chinese and Polish

adolescents: Two moderated mediation analyses. International Journal of Clinical and Health Psychology, 10(2), 265-278.

Mancha, R., Muniz, K., & Yoder, C. (2014). Studying executives' green behaviors: an environmental theory of planned behavior.

Marschall, D. Saftner, J., & Tangney, J. P. (1994). The State Shame and Guilt Scale. George Mason University, Fairfax, VA.

Meinhold, J. L., & Malkus, A. J. (2005). Adolescent environmental behaviors: Can knowledge, attitudes, and self-efficacy make a difference?. Environment and behavior, 37(4), 511-532.

Moisander, J. (2007). Motivational complexity of green consumerism. International journal of consumer studies, 31(4), 404-409.

Monroe, M. C. (2003). Two avenues for encouraging conservation behaviors. Human Ecology Review, 113-125.

Mortan, R. A., Ripoll, P., Carvalho, C., & Bernal, M. C. (2014). Effects of emotional intelligence on entrepreneurial intention and self-efficacy. Revista de Psicología del Trabajo y de las Organizaciones, 30(3),97-104.

Murnieks, C. Y., Mosakowski, E., & Cardon, M. S. (2014). Pathways of passion: Identity centrality, passion, and behavior among entrepreneurs. Journal of management, 40(6), 1583-1606.

Nguyen, H. T. (2019). Development and validation of a women's financial self-efficacy scale. Journal of financial counseling and planning, 30(1), 142-154.

Norman, P. A. U. L., & Conner, P. (2005). Predicting health behaviour: a social cognition approach. Predicting health behaviour, 1.

O'Brien, K. (2013). Global environmental change III: Closing the gap between knowledge and action. Progress in Human Geography, 37(4), 587–596. https://doi.org/10.1177/0309132512469589.

Orbell, S. (2003). Personality systems interactions theory and the theory of planned behaviour: Evidence that self-regulatory volitional components enhance enactment of studying behaviour. British Journal of Social Psychology, 42(1), 95-112.

Patwardhan, M., Flora, P., & Gupta, A. (2010). Identification of secondary factors that influence consumer's buying behavior for soaps and chocolates. IUP journal of marketing management, 9(1/2), 55.

Polonsky, M. J., Vocino, A., Grimmer, M., & Miles, M. P. (2014). The interrelationship between temporal and environmental orientation and pro-environmental consumer behaviour. International journal of consumer studies, 38(6), 612-619.

Pornari, C. D., & Wood, J. (2010). Peer and cyber aggression in secondary school students: The role of moral disengagement, hostile attribution bias, and outcome expectancies. Aggressive Behavior: Official Journal of the International Society for Research on Aggression, 36(2), 81-94.

Prochaska, J. O., & Velicer, W. F. (1997). The transtheoretical model of health behavior change. American journal of health promotion, 12(1), 38-48.

Ramayah, T., Lee, J. W. C., & Mohamad, O. (2010). Green product purchase intention: Some insights from a developing country. Resources, conservation and recycling, 54(12), 1419-1427.

Ramus, C. A., & Killmer, A. B. C. (2007). Corporate greening through prosocial extra role behaviours—A conceptual framework for employee motivation. Business Strategy and the Environment, 16, 554-570.

Reese, G., & Junge, E. A. (2017). Keep on rockin'in a (plastic-) free world: Collective efficacy and pro-environmental intentions as a function of task difficulty. Sustainability, 9(2), 200.

Richins, M. L. (2004). The material values scale: Measurement properties and development of a short form. Journal of consumer Research, 31(1), 209-219.

Richins, M. L., & Dawson, S. (1992). A consumer values orientation for materialism and its measurement: Scale development and validation. Journal of consumer research, 19(3), 303-316.

Rigamonti, L., Grosso, M., Møller, J., Sanchez, V. M., Magnani, S., & Christensen, T. H. (2014). Environmental evaluation of plastic waste management scenarios. Resources, Conservation and Recycling, 85, 42-53.

Riggs, M. L., & Knight, P. A. (1994). The impact of perceived group success-failure on motivational beliefs and attitudes: a causal model. Journal of Applied psychology, 79(5), 755.

Sawitri, D. R., Hadiyanto, H., & Hadi, S. P. (2015). Pro-environmental behavior from a socialcognitive theory perspective. Procedia Environmental Sciences, 23, 27-33.

Schultz, P. (2000). Empathizing with nature: The effects of perspective taking on concern for environmental issues.

Schutte, N. S., & Bhullar, N. (2017). Approaching environmental sustainability: Perceptions of self-efficacy and changeability. The Journal of Psychology, 151(3), 321-333.

Scott, D., & Willits, F. K. (1994). Environmental attitudes and behavior: A Pennsylvania survey. Environment and behavior, 26(2), 239-260.

Schwartz, S. H., Cieciuch, J., Vecchione, M., Davidov, E., Fischer, R., Beierlein, C., & Konty, M. (2012). Refining the theory of basic individual values. Journal of personality and social psychology, 103(4), 663.

Sheeran, P. (2002). Intention—behavior relations: a conceptual and empirical review. European review of social psychology, 12(1), 1-36.

Sirois, F. M. (2004). Procrastination and intentions to perform health behaviors: The role of self-efficacy and the consideration of future consequences. Personality and Individual differences, 37(1), 115-128.

Smythe, P. C., & Brook, R. C. (1980). Environmental concerns and actions: A social-psychological investigation. Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement, 12(2), 175.

Sniehotta, F. F., Schwarzer, R., Scholz, U., & Schüz, B. (2005). Action planning and coping planning for long-term lifestyle change: theory and assessment. European Journal of Social Psychology, 35(4), 565-576.

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. Journal of environmental psychology, 29(3), 309-317.

Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014). An integrated framework for encouraging pro-environmental behaviour: The role of values, situational factors and goals. Journal of Environmental psychology, 38, 104-115.

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behaviour. Journal of Social Issues, 56, 407e424.

Strizhakova, Y., & Coulter, R. A. (2013). The "green" side of materialism in emerging BRIC and developed markets: The moderating role of global cultural identity. International Journal of Research in Marketing, 30(1), 69-82.

Swim, J. K., Stern, P. C., Doherty, T. J., Clayton, S., Reser, J. P., Weber, E. U., Gifford, R., & Howard, G. S. (2011). Psychology's Contributions to Understanding and Addressing Global Climate Change. *American Psychologist*, *66*(4), 241-250. https://doi.org/10.1037/a0023220

Tabernero, C., & Hernández, B. (2011). Self-efficacy and intrinsic motivation guiding environmental behavior. Environment and Behavior, 43(5), 658-675

Tangney, J. P., Stuewig, J., & Mashek, D. J. (2007). Moral emotions and moral behavior. Annu. Rev. Psychol., 58, 345-372.

Thaker, J. (2012). Climate change in the Indian mind: Role of collective efficacy in climate change adaptation. George Mason University.

Thøgersen, J., & Crompton, T. (2009). Simple and painless? The limitations of spillover in environmental campaigning. Journal of Consumer Policy, 32(2), 141-163.

Tilikidou, I., & Delistavrou, A. (2008). Types and influential factors of consumers' non-purchasing ecological behaviors. Business Strategy and the Environment, 17(1), 61-76.

Tracy, J. L., & Robins, R. W. (2007). The psychological structure of pride: a tale of two facets. Journal of personality and social psychology, 92(3), 506.

Truelove, H. B., & Parks, C. (2012). Perceptions of behaviors that cause and mitigate global warming and intentions to perform these behaviors. Journal of Environmental Psychology, 32(3), 246-259.

Truelove, H. B., Carrico, A. R., Weber, E. U., Raimi, K. T., & Vandenbergh, M. P. (2014). Positive and negative spillover of pro-environmental behavior: An integrative review and theoretical framework. Global Environmental Change, 29, 127-138.

UNEP (2012). The critical role of global food consumption patterns in achieving sustainable food systems and food for all. Discussion paper.

Van Thiel, S. (2014). Research methods in public administration and public management: An introduction. Routledge.

Vlek, C., & Steg, L. (2007). Human behaviour and environmental sustainability: problems, driving forces and research topics. Journal of Social Issues, 63(1), 1–19.

Watson, D. C. (2014). Materialism: Profiles of agreeableness and neuroticism. Personality and Individual Differences, 56, 197-200.

Williams, D. M., Anderson, E. S., & Winett, R. A. (2005). A review of the outcome expectancy construct in physical activity research. Annals of behavioral medicine, 29(1), 70-79.

Wood, R., & Bandura, A. (1989). Social cognitive theory of organizational management. Academy of management Review, 14(3), 361-384.

Xiang, P., McBride, R., Guan, J., & Solmon, M. (2003). Children's motivation in elementary physical education: An expectancy-value model of achievement choice. Research quarterly for exercise and sport, 74(1), 25-35.

Yusliza, M. Y., Amirudin, A., Rahadi, R. A., Nik Sarah Athirah, N. A., Ramayah, T., Muhammad, Z., & Mokhlis, S. (2020). An investigation of pro-environmental behaviour and sustainable development in Malaysia. Sustainability, 12(17), 7083.

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. Contemporary educational psychology, 25(1), 82-91.

Appendices

Appendix A. Detailed description of items

Table A1.

Components and items

1) Pro-environmental self-efficacy	
Pro-environmental self-efficacy expectancy	• I have the ability and the capacity to engage in environment-friendly behaviour. • I have the ability to take action to fight global warming. • I am capable of living in an environmental-friendly way, even if it causes me inconvenience. • I know what behaviour to perform to live in an environmental-friendly way. • I am capable of putting extra effort into performing pro-environmental behaviour to mitigate global warming.
Pro-environmental individual outcome expectancy	• I am capable of contributing to reducing my global footprint. • My environmental-friendly actions contribute to diminishing the climate crisis. • By limiting my environment-damaging activities, I contribute to reducing climate change. • I believe that if I engage in pro-environmental behaviour it can make an impact. • My environmental-friendly actions have no impact on reducing the climate crisis. (R)

	• I believe that my environmental-friendly actions improve the living conditions on earth.
2) Pro-environmental collective efficacy	
Pro-environmental collective efficacy expectancy	• I believe that we all have the capacity and the ability to live in a pro-environmental way. • Although it may cause inconvenience, we all have the ability of living an environmental-friendly life. • In everyday life, we all can take actions to live in a more environmental-friendly way. • I believe that together we all can encourage more and more people to engage in environmental-friendly behaviours. • The people I know possess the capabilities to execute pro-environmental behaviour.
Pro-environmental collective outcome expectancy	• If we all set our minds to it, we can mitigate climate change and reduce our global footprint together. • If we all limit our environment-damaging activities, we can together contribute to reducing global warming. • Even if we all set our minds to it, we cannot fight climate change. (R) • It is not too late to fight climate change, if we jointly engage in pro-environmental behaviour. • No matter what we do, we cannot fight climate change. (R) • By engaging in pro-environmental behaviour together, we can reach our sustainability goals e.g. decreasing our footprint.

3) Materialism	• I admire people who own expensive homes, clothes, and other items. • The things I own say a lot about how well I am doing in life. • I usually buy only the things I need. (R) • Buying (unnecessary) things gives me pleasure. • I would be happier if I could afford to buy more things. • It bothers me that I cannot afford to buy all the things I would like.
4) Pro-environmental intention	• My intentions to put extra effort (as compared to what I already do) into abstaining from plastic while shopping are: • My intentions to reduce my eco-footprint in the next month are: • My intentions to behave more environment-friendly in the next month are: • My effort in performing sustainable behaviour is already high enough. • My engagement in environmentally friendly behaviour is already high enough. • My intentions to further improve my current environmentally friendly actions are:
5) Pro-environmental behaviour	• I use public transport instead of my car, whenever possible. • I avoid unnecessary car rides as much as possible. • If I am offered a plastic bag in a store, I will always take it. (R)

	• I have been making adjustments to my household to make it more energy and water efficient. • When I purchase fruits and vegetables, I make sure they are grown as locally as possible.
6) Pro-environmental attitudes	• I would be willing to sacrifice some personal comforts to recycle more plastic. • I would be willing to sacrifice some personal comfort to save energy. • I would be willing to pay higher prices for goods and services if it helped to protect the environment.
7) Awareness of the environmental issue	• Humans are taking a toll on the ecosystem. • Nature's balance is extremely fragile and easily disrupted. • Humans have the right to alter the natural environment to better suit their needs. (R) • The so-called "ecological disaster" that humanity is experiencing has been way overstated. (R)
8) Pride and guilt about pro-environmental behaviour	• Imagine that you are in a store and decide to buy an environmentally friendly product. How would you feel? (proud, accomplished, confident, satisfied, worthwhile) • Imagine that you are in a store and decide not to buy an environmentally friendly product. How would you feel? (guilty, remorseful, sorry, bad, ashamed) • If I behave in an environmentally friendly way, then I would feel....(proud, accomplished, confident, satisfied, worthwhile)

	• If I behave in an environmentally unfriendly way, then I would feel …. (guilty, remorseful, sorry, bad, ashamed).

Appendix B. Detailed description of demographic variables

Three response options measured *gender*: male, female or other/ I would rather not say.

Age was measured by filling in a number. Participants had the option of entering a number up to three digits.

Nationality is measured by providing the participants with a blank option where people could fill in their country of origin.

Educational level was measured by the highest level of education of the participants. There were seven answer options based on educational level: no formal qualifications (0), GSCE/0-Level (1), A-Level/Higher/BTEC (2), Vocational/NVQ (3), Degree or equivalent (4), Postgraduate qualification (5), other (6).

Occupation, the participants' field was measured by questioning which employment the participant practises most of the time, namely: student, working, volunteer, non-working, retired or other/I would rather not say.

Net income was measured by asking the average income per month of the participant. Five possibilities were present: less than €1.000, between €1.000 and €2.500, between €2.501 and €5.000, €5.001 or more or I would rather not say.

The household composition was measured by asking the participant whether they have children or not and how many as this could increase future concerns. There were four answer options: 0, 1, 2, 3 or more.

Proficiency in English is measured by letting respondents state their English-language skills. The question "I am proficient in English" was asked based on a 7-item Likert scale ranging from 1 (completely disagree) to 7 (completely agree).

Appendix C. Descriptive statistics

Table C1.

Demographics

	N	**%**		***N***	**%**
Gender			**Children**		
Female	176	57	No	177	57.7
Male	131	43	Yes	160	42.3
Nationality			**Occupation**		
Dutch	280	91.2	Student	71	23.1
Other European background		7.5	Working	220	71.7
Bosnian	4		Volunteer	2	.7
British	3		Non-working	8	2.6
Croatian	2		Retired	2	.7
French	3		Other/I Would rather not say	4	1.3
German	2				
Irish	1				
Kurdish	2				
Latvian	1				
Luxembourgish	1				
Spanish	3				
Turkish	1				
Russian	1				
Other		1.3			
American	2				
Educational level			**Monthly income**		
Primary education	1	0.3	Less than 1.000	47	15.3
Secondary education	21	6.8	Between 1.000 and 2.500	127	41.4
Vocational training (MBO)	74	24.1	Between 2.501 and 5.000	95	30.9
University of Applied Sciences (HBO)	66	21.5	5.001 or more	22	7.2
University Bachelor	33	10.7	I would rather not say	15	4.9
University Master	112	36.5			
	M	**SD**			
Age	30.45	10.68			

Table C2.

Correlation Matrix

	Pes_eff_exp	Pes_outc_exp	Col_eff_exp	Col_outc_exp	PEB	Intention	Materialism	Awareness of the environmental issue	Pro-environmental attitudes	Pride_buying	Guilt_buying	Pride_behaviour	Guilt_behaviour	Educational level	Children	Age2	Female
Pes_eff_exp																	
Pearson correlation																	
Pes_outc_exp																	
Pearson correlation	.894**																
Sig.	<.001																
Col_eff_exp																	
Pearson correlation	.897**	.865**															
Sig.	<.001	<.001															
Col_outc_exp																	
Pearson correlation	.874**	.854**	.895**														
Sig.	<.001	<.001	<.001														
PEB																	
Pearson correlation	.723**	.760**	.690**	.676**													
Sig.	<.001	<.001	<.001	<.001													
Intention																	
Pearson correlation	.726**	.773**	.699**	.674**	.872**												
Sig.	<.001	<.001	<.001	<.001	<.001												
Materialism																	
Pearson correlation	-.380**	- .421**	-365**	-.371**	-.531**	-.495**											
Sig.	<.001	<.001	<.001	<.001	<.001	<.001											
Awareness of the environmental issue																	
Pearson correlation	.767**	.731**	.774**	.776**	.640**	.628**	-.398**										
Sig.	<.001	<.001	<.001	<.001	<.001	<.001	<.001										
Pro-environmental attitudes																	
Pearson correlation	.750**	.751**	.728**	.735**	.744**	.726**	-.437**	.774**									
Sig.	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001									
Pride_buying																	
Pearson correlation	.523**	.446**	.545**	.539**	.306**	.327**	-.018	.427**	.446**								
Sig.	<.001	<.001	<.001	<.001	<.001	<.001	.750	<.001	<.001								
Guilt_buying																	
Pearson correlation	.542**	.534**	.479**	.482**	.503**	.509**	-.253**	.457**	.592**	.627**							
Sig.	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001							
Pride_behaviour																	
Pearson correlation	.542**	.456**	.529**	.530**	.328**	.339**	-.026	.416**	.436**	.916**	.663**						
Sig.	<.001	<.001	<.001	<.001	<.001	<.001	.649	<.001	<.001	<.001	<.001						
Guilt_behaviour																	
Pearson correlation	.584**	.563**	.518**	.527**	.505**	.521**	-.208**	.492**	.577**	.647**	.850**	.704**					
Sig.	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001					
Educational level																	
Pearson correlation	.423**	.438**	.384**	.391**	.558**	.497**	-.356**	.463**	.501**	.058	.199**	.064	.245**				
Sig.	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	.307	<.001	.263	<.001				
Children																	
Pearson correlation	-.203**	-.115*	-.230**	-.224**	-.069	- .046	-.092	-.220**	-.175**	-.403**	-.162**	-.344**	-.185**	-121*			
Sig.	<.001	.045	<.001	<.001	.227	.425	.108	<.001	.002	<.001	.004	<.001	.001	.034			
Age2																	
Pearson correlation	.034	.106	.044	.057	.162**	.209**	-.263**	.030	.091	-.067	.085	-.018	.071	-.047	.587**		
Sig.	.551	.065	.447	.320	.004	<.001	<.001	.599	.111	.240	.136	.755	.216	.411	<.001		
Female																	
Pearson correlation	-.025	-.043	.001	-.037	-.043	- .053	.223**	-.061	-.017	.160**	.154**	. 130*	.182**	-.120*	.006	.064	
Sig.	.666	.453	.989	.522	.450	.356	<.001	.285	.763	.005	.007	.023	.001	.036	.913	.266	

**. Correlation is significant at the 0.01 level

*. Correlation is significant at the 0.05 level

Appendix D. Multiple regression analysis

Table D1.

Skewness and Kurtosis

		Statistic	Std. Error
Pes_eff_exp			
	skewness	-.955	.139
	kurtosis	-.543	.277
Pes_outc_exp			
	skewness	-.653	.139
	kurtosis	-.935	.277
Col_eff_exp			
	skewness	-1.030	.139
	kurtosis	-.416	.277
Col_outc_exp			
	skewness	-1.034	.139
	kurtosis	-.366	.277
PEB			
	skewness	-.179	.139
	kurtosis	-1.302	.277
Intention			
	skewness	-.241	.139
	kurtosis	-1.088	.277
Materialism			
	skewness	.335	.139
	kurtosis	-1.130	.277
Attitudes			
	skewness	-.751	.139
	kurtosis	- .759	.277
Awareness			
	skewness	-.810	.139
	kurtosis	-.410	.277
Pride_buying			
	skewness	0,077	0,139
	kurtosis	-1,283	0,277
Guilt_buying			
	skewness	0,571	0,139
	kurtosis	-0,607	0,277
Pride_behaviour			
	skewness	0,159	0,139
	kurtosis	-1,236	0,277
Guilt_behaviour			
	skewness	0,457	0,139
	kurtosis	-0,715	0,277