Gender differences in Personal Values as Antecedents of Pro-environmental Behavior - Evidence from the European Social Survey

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Tiivistelmä – Referat– Abstract

This thesis aims to study if personal values mediate the effect of gender on pro-environmental behavior, PEB. It is important to investigate the antecedents of PEB, since the current climate crisis is caused by human behavior. Among the most influential areas of behaviors are those related to energy. Therefore, two energy related behaviors were chosen to represent PEB in this study: energy use reduction and intention of buying an energy efficient appliance. Values have been shown to affect behavior and there is some evidence of gender differences in values, thus gender and values were chosen as predictors of the behaviors. The theoretical basis for this argument lies in Schwartz theory of basic values and several models on antecedents of PEB, e.g. the Value-Belief-Norm Theory. The material comes from the 2016 dataset of the European Social Survey Round 8 (ESS8), which included a module on climate change and energy and used the Portrait Values Questionnaire for measuring values. The data is limited to the Finnish nationally representative sample. The hypotheses examine whether Finnish women behave more pro-environmentally than Finnish men do, and whether women's higher self-transcendent values and men's higher self-enhancement values explain this difference in PEB. Hypotheses were tested through hierarchical stepwise regression analysis and mediation analysis. The results were as expected, with small, but statistically significant, differences between men and women in both values and behavior. On average, Finnish women have more self-transcendent values and behave more pro-environmentally, than Finnish men do. The mediation was supported even when covariates were included, which further supports the findings. The only exception to this was the mediation of gender on energy efficacy behavior through self-enhancement values. Explanations for this and the other results are discussed, as well as critique of the binary definition of gender and other limitations. This study adds to the understanding of antecedents of pro-environmental behavior, which is fundamental to achieving effective behavior change.

Syftet med denna magisteravhandlig har varit att undersöka huruvida personliga värden medierar effekten av kön på miljövänligt beteende, PEB (pro-environmental behavior). Det är viktigt att undersöka vad som påverkar PEB, eftersom den pågående klimatkrisen orsakas av mänskligt beteende. Energirelaterad beteende tillhör de mest inflytelserika typer av beteende och därför valdes två energirelaterade beteenden för att representera PEB i denna studie: minskning av energiförbrukning och intention att köpa energieffektiva apparater. Det har påvisats att värden har en inverkan på beteendet, och det finns en viss bevisföring om att könsskillnader i värden, följaktligen valdes kön till utgångsvariabel och värderingar till medierande variabel. Den teoretiska referensramen för argumenteringen ligger i Schwartz värdeteori och ett flertal modeller om PEB, t.ex. värde-uppfattning-norm teorin. Materialet är taget ut European Social Surveys runda 8 (ESS8), insamlad 2016, som innehöll en modul om klimatförändringen och energi och använder PVQ för att mäta värden. Datat är begränsat till det finska nationellt representativa samplet. Hypoteserna granskar huruvida finländska kvinnor beter sig mera miljövänligt än finländska män, och ifall kvinnors högre självtranscendenta värden och mäns högre självcentrerade värden förklarar skillnaden i PEB. Hypoteserna testades genom stegvis hierarkisk regressionsanalys och medierande analys. Resultaten visade, som förväntat, små statistiskt signifikanta skillnader mellan män och kvinnor i både värden och beteende. Finländska kvinnor har i snitt mera kollektivistiska värderingar och beter sig mera miljövänligt än vad finländska män gör. Medieringen stöddes även då kontrollvariabler inkluderades, vilket stöder resultaten ytterligare. Det enda undantaget utgjordes av medieringen av kön på energieffektiv beteende genom självcentrerade värden. Förklaringar till detta och de övriga slutsatserna diskuteras, samt kritik mot den binära könsdefinieringen och andra begränsningar. Denna studie bidrar till förståelsen av vad som påverkar miljövänligt beteende, vilket är angeläget för att kunna uppnå effektiv beteendeförändring.

Avainsanat – Nyckelord – Keywords
gender, values, pro-environmental behavior, energy behavior, environmental psychology,

Contents

1. INTRODUCTION

Humanity is facing a climate emergency. The trend of rising surface temperatures, first known as global warming, became the threat of climate change and has now gone into a phase of outright climate crisis even catastrophe and tragedy. The Intergovernmental Panel on Climate Change has provided us with ample scientific evidence (2018) of this alarming process and of the fact that human behavior is at the core of why this is happening. In a powerful appeal (Ripple et al., 2019), thousands of scientists are warning us of the consequences of continuing with "business as usual", with a for humans unhabitable planet Earth being one projected outcome. They also present some clear - yet difficult to achieve - pathways to save that which possibly can still be saved of life on Earth as we know it.

One of the key steps presented by Ripple et al. (2019), concerns energy efficiency and conservation practices, since energy production and usage is one of the leading causes of climate change. The choices we make and actions we take as societies, groups and individuals in relation to energy usage therefore have a big impact on the environment, both locally and globally. For this reason, energy related behavior has long been the subject of studies on pro-environmental behavior (hereinafter *PEB*). Social psychologists who have a special interest in environmental behavior (a.k.a. environmental psychologists) pose questions like: "Why do people behave pro-environmentally?", "What affects PEB?", "Are there group differences in behaving pro-environmentally? If so, then why?".

It is an undeniable fact, in all of human existence, that we are constantly situated in an environment that we interact with. Environmental psychology originally focused on studying how environments affect humans, e.g. in architecture and psychotherapy, but the field gradually turned to also explore the impact of humans on the environment. This has resulted in some groundbreaking research on psychological factors (e.g., values, behavior), social factors (e.g., norms) and structural factors (e.g., policies, demographics) connected to the environment, which has increased remarkably during the last decades (Gifford, 2014). The research on PEB is one such field, that has the potential to bring forth some pragmatic results for handling the environmental challenges humanity as a whole now faces.

Since changes in personal energy behavior have a big impact on the environment, I have chosen to explore a research question focused on the antecedents of energy behavior as PEB. Antecedents are influential factors preceding, for example, a behavior, and they can be psychological, social or external. By knowing what affects behavior, we have better chances of changing behavior. I focus on values and demographical factors as antecedents, because they have been shown to influence PEB. Therefore, my thesis hypothesizes that gender, through values, affects PEB. For a successful study I need a reliable material containing relevant variables an I have therefore utilized the quantitative data material of the European Social Survey round 8 from 2016 (abbr. ESS8), which I have analyzed using hierarchical regression analysis and mediation analysis. I first describe the theoretical background and previous research on PEB, values, and gender differences, as well as terminology within these subjects. Then I present my material and methods in depth and finally I report results, discuss them and my conclusions.

2 PRO-ENVIRONMENTAL BEHAVIOR

Environmental psychology is focused on the interchange between humans and environment. This can range from urban planning to eco-theology, from constructed to natural habitats, outside settings to inner settings, even digital environments (Gardner & Stern, 2002; Gifford, 2014) What is meant by *environment* thus depends on the context and can vary from impacts on global scale to concerns for a very specific ecosystem. The Oxford English Dictionary (2004) displays the twofold usage of the word "environment" in an eloquent way in the definitions: 1) "the surroundings or conditions in which a person, animal or plant lives or operates." and 2) "(the environment) the natural world, especially as affected by human activity."(p. 477). It is as if environment cannot exist without some kind of relation to a living being, without being the object of life, operation, or activity happening in it or to it.

This thesis mostly refers to the latter definition in its usage of environment related terms like *pro-environmental* and so does most of the literature referenced here. However, it is worth keeping in mind this twofold nature of *environment*, since the environment we are behaving in also impacts the way we behave for the environment.

2.1 What is pro-environmental behavior?

There are many ways to refer to behavior related to the environment. In this thesis this behavior will be referred to as pro-environmental behavior (PEB). The term *pro-environmental* is used by several researchers (e.g., Arnocky & Stroink, 2011), but could as well be called *environmentally friendly* (e.g., Ojala, 2012), or *environmentally significant* behavior (Stern, 2000). These terms are generally interchangeable. Schultz & Kaiser (2012) add that also *conservation*, *sustainability*, *efficiency*, *environmental protection*, and *preservation*, can be considered pro-environmental. They continue to point out the complexity of defining what is pro-environmental by highlighting two conundrums: changing standards (e.g., cultural and historical) and relativity of actions (e.g., CO^2 generated by breathing vs. driving vs. flying). What is seen as pro-environmental is relative and subject to comparison. It is also important to recognize the difference between definitions driven by impact and those driven by intention. The focus on impact can be

summarized as " … behaviors that contribute to the sustainability of the natural environment" (Schultz & Kaiser, 2012, p. 558)," … behaviour that harms the environment as little as possible, or even benefits the environment" (Steg & Vlek, 2009, p. 309) and/or " … the extent to which it [the behavior] changes the availability of materials or energy from the environment or alters the structure and dynamics of ecosystems or the biosphere itself" (Stern, 2000, p. 408).

Intention focused PEB on the other hand is " … a behavior intended to contribute toward the sustainability of the natural environment." (Schultz & Kaiser, 2012, p. 560) or " … behavior that consciously seeks to minimize the negative impact of one's actions on the natural and built world." (Kollmuss & Agyeman, 2002, p. 240). Intention is thus mostly concerned with the psychological processes directing a person towards PEB. This intention does not necessarily have the desired impact on the environment, since intention is not yet a fulfilled action and intention could be misguided regarding the actual impact of the behavior. Nonetheless, intentions of PEB have been studied on multiple occasions and are especially valuable for research on behavior change.

By classifying whether the behavior is direct or indirect and in which domain it is carried out, Stern (2000) makes a further categorization into four types of PEB: (a) environmental activism; (b) non-activist public behavior; (c) private-sphere environmentalism; and, (d) others (e.g., influencing an organization). The most commonly researched in psychology is private-sphere environmentalism, with behaviors like buying organically grown food (Grunert & Juhl, 1995), recycling (Gould et al., 2016) or water conservation (Engqvist Jonsson & Nilsson, 2014), which usually have a small, but direct impact on the environment.

Energy related behaviors, such as reducing energy use, energy conservation or buying energy efficient appliances, also generally fall into the private category, since they are performed in the home or as an act of individual consumerism. Energy behaviors are often measured through self-report on surveys, but also through objective measurements from electricity meters (Abrahamse & Steg, 2009; Abrahamse et al., 2005; Poortinga et al., 2004). This makes comparison between objective impact and subjective self-reported

impact or intention possible, which is necessary, since pro-environmental energy behavior often is the result of non-environmental motives (Whitmarsh, 2009).

In this study one item is used for measuring impact, i.e. habitual energy use reduction behaviors; and another item for measuring intention, i.e. asking whether the respondent were likely to buy an energy efficient appliance. Why people behave (or don't behave) pro-environmentally is explored next.

2.2 Antecedents of pro-environmental behavior

What motivates people to behave pro-environmentally? What are the factors that precede behavior? These antecedents are so many and so varied, that most scientists exploring PEB agree that due to its complexity, PEB cannot be explained by only one theory or with only one framework (e.g., Gifford, 2014). In their review of studies on antecedents of PEB, Kollmuss & Agyeman (2002) present a series of models, including their own, aimed at explaining the relations between different factors influencing PEB. Among these, the Norm-Activation Model (Schwartz, 1977) and the Value-Belief-Norm Theory (Stern, 2000) will be discussed in chapter 4 of this thesis.

Different researchers have come to different categorizations for the factors influencing PEB. Kollmuss and Agyeman (2002) divide them into demographic factors, external factors and internal factors, highlighting both the negative impact and the positive impact a factor can have. Gifford and Nilsson (2014) discern personal and social factors, adding that individuals may also have non-environmental reasons for PEB. A recent review of determinants of PEB (Li et al., 2019) index them as external variables and individual variables, claiming demographics and psychological variables belong to the category of individual variables. All in all, some of the commonly agreed upon factors influencing PEB are infrastructure, culture, environmental knowledge and awareness, values, responsibility, attitudes, habits and demographical variables like gender, age, education and place of residence (Gifford & Nilsson, 2014; Kollmuss & Agyeman, 2002; Li et al., 2019).

The summarized explanation of the antecedents of PEB is that "many conflicting and competing factors shape our daily decisions and actions. "(Kollmuss & Agyeman, 2002, p. 256) or that

> [what influences PEB] … is so multi-faceted as to defy reasonable integration and comprehension. The likely reason for this is that many of the factors influence each other through moderation or mediation. Some overwhelm others in their impact, but those others may appear to have effects if they are considered in isolation. (Gifford & Nilsson, 2014, p. 11)

In this thesis, an attempt is made at untangling some of these complexities and uncovering a potentially mediational relationship. In the following chapter one of the relevant antecedents, i.e. the individual, internal and psychological factor known as values, will be examined, and demographical factors will be added into the question in chapter 5.

3 SCHWARTZ THEORY OF BASIC VALUES

Values are phenomena that are studied in a broad range of academic disciplines and from many perspectives. In their dialog between psychology and philosophy, Cieciuch and Schwartz (2017) argue that the academic origin of values lies in philosophy as well as ethics and, can inductively be found in all human activities and cultures. We are human; therefore, we evaluate. According to them, values find bearing in biology and genetics, as well as in a person's position in the societal structure surrounding them.

Many social researchers have developed value theories, e.g. Inglehart and Rokeach (Steg & de Groot, 2012). However, the European Social Survey is based on research done by Schwartz, which makes it the primary focus of this thesis. Schwartz theory of basic values (Schwartz, 1992), also sometimes referred to as the Theory of Basic Human Values or Schwartz's Value Theory, was first conceived in the 1990's and has since become one of the most commonly used theories on human values, resulting in hundreds of studies during more than two decades. The universality of the theory has been tested and validated by numerous cross-cultural studies (e.g. Bilsky, Janik & Schwartz, 2010; Schwartz 1994), and has contributed to the development of culturally distinct values (Schwartz, 2006), which are different from the personal values that are presented next.

3.1. What are personal values?

The psychological constructs held by individuals, as opposed to groups or cultures, are called personal values (Schwartz, 2012). Schwartz (1994) defines values as "*desirable, trans-situational goals, varying in importance, that serve as guiding principles in people's lives*", which is a summary of the six features (Schwartz, 2012) that separate values from related concepts such as beliefs and attitudes:

- Values are linked to affect; i.e., we have feelings about our values.
- Values motivate action since they refer to desirable goals.
- Values are transcendent; i.e., applicable to different actions and situations.
- Values guide our evaluation of things; i.e., we base our standards on our values.
- Values have a subjective, relative hierarchy of importance.

- This hierarchy guides our actions and behavior.

Values are formed as a response to basic requirements of individual biological needs, coordinated social interaction and the functioning and survival of the group (Schwartz, 1994), but personal values differ from cultural or group values especially in their hierarchy of importance, i.e. the individual value prioritization (Schwartz, 2012). To obtain information about this prioritization is also the main goal in the measurement of values.

3.2 Measuring values

The universal nature of the Schwartz theory of basic values is based on its origin in cross-cultural studies of values, in which a new instrument for measuring values, the Schwartz's Value Survey (SVS), was introduced (Schwartz, 1994, 2006). The SVS consists of a questionnaire containing 57 items on different values, which the respondents rate "as a guiding principle in MY life" on a 9-point scale. The SVS has also been made into a shorter version called Short Schwartz's Value Survey (SSVS), which displays the same validity as the original one (Lindeman & Verkasalo, 2005). However, in studies with children and persons not educated in the context of Western abstract thinking, the SVS has proven to be less efficient and so an alternative survey called the Portrait Values Questionnaire (PVQ) was developed (Schwartz, 2012).

The difference with the PVQ, compared to the SVS, is that instead of having to rate abstract value items, the respondents are provided with descriptions of persons. Each item consists of a portrait of a person (e.g. "Thinking up new ideas and being creative is important to him. He likes to do things in his own original way"). The respondents answer the question "How much like you is this person?" on a scale from 1 to 6 (1 = *very much like me* to 6 = *not like me at all*). Values are inferred from the respondents' comparison of the portrait to themselves. It is important to note that the portraits are not describing traits of a person, but goals and behaviors which make evaluations more focused on values than on personalities (Schwartz, 2012). The original PVQ contained 40 items, whereas the short version used in the European Social Survey only has 21 items.

Both the SVS and the SSVS, as well as the two versions of the PVQ, are still used by researchers and have also been used to assess the validity of the Schwartz theory of basic values. They have provided universal, cross-cultural support for the circular structure presented next (see e.g., Bilsky et al, 2010; Schwartz, 2012; Schwartz et al. 2012).

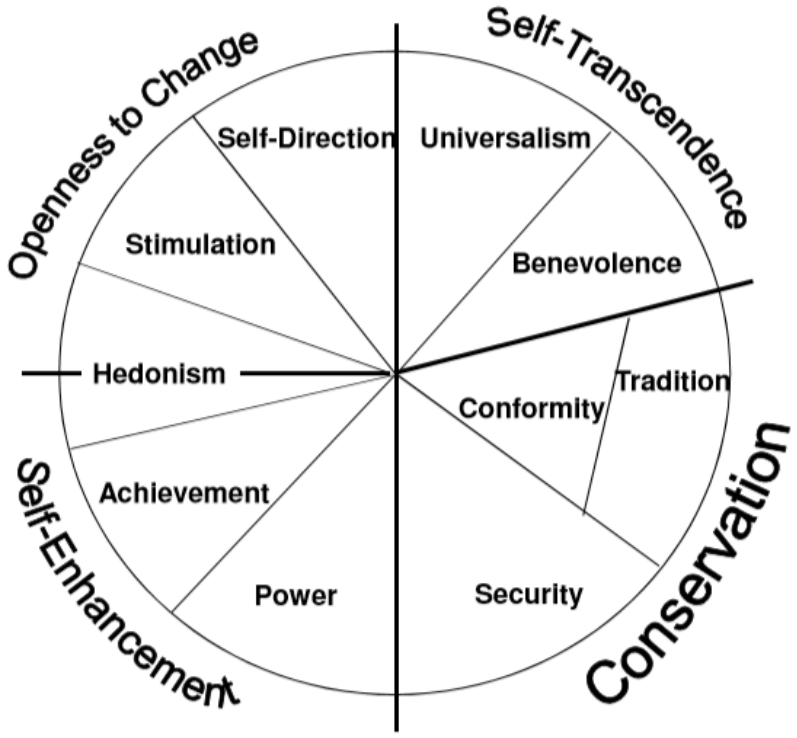
3.3 The structure of value relations

Schwartz theory of basic values posits that all values can be grouped into ten basic values, placed on two dimensions (Schwartz, 1992). The ten basic values are: self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence, and universalism. In later research these ten values have been extended using 19 more distinct values, that still fit the same structure (Schwartz et al. 2012). Nevertheless, the instructions for coding used in the European Social Survey are still based on the division of ten (ESS, n.d.-c)

According to Schwartz (2012), these ten basic values are related to each other in a way that forms a circular structure (see Figure 1). When pursuing a goal, a person acts in accordance with certain values and in opposition to other values, which then posits that there are values that are similar to each other (e.g., power and achievement) and values that are in conflict with each other (e.g., power and universalism). The values that are similar to each other are closer to one another in the circular structure and describe similar motivation to pursuing a goal. This means that values are not distinctly separate but defined on a motivational continuum. Universalism is the value most closely connected to pro-environmental behavior, since it is concerned with care for nature and the world beyond one's closest affiliations. Values that are closely related to universalism (i.e. benevolence) or in strong conflict to it (i.e. power and achievement) are thus the most relevant for the focus of this thesis.

Figure 1

Circular Structure of Value Relations in Schwartz Theory of Basic Values



Note. Figure from Schwartz, 2012.

In the circular structure the main conflicts between values can be seen as two dimensions, spanning opposite sides of the circle:

1. openness to change (self-direction, stimulation and hedonism) vs. conservatism (conformity, tradition, security) and
2. self-transcendence (universalism, benevolence) vs. self-enhancement (power, achievement, hedonism).

As can be seen from the figure, hedonism is borderline between openness to change and self-enhancement, which is why it can be included in both dimensions. In the study of PEB, the dimension opposing self-transcendence to self-enhancement has been proven to be more influential, since the latter contains the value of universalism (Schwartz, 2012; Steg & de Groot, 2012), which brings us to the next chapter.

4 VALUES AFFECTING PRO-ENVIRONMENTAL BEHAVIOR

As reviewed above, values play a role in explaining behavior, therefore also PEB. Nevertheless, some values influence PEB stronger than others, the value of universalism being the focal point for all things environmental. Therefore, the research on PEB often uses a narrower scope of values from the Schwartz theory of basic values, leaving out most of the dimension of openness to change vs. conservation. This has led to the emergence of theories explicitly focused on the process of PEB and its many forms.

4.1 Value orientations

A behavior might be influenced by different values, but some behaviors are primarily influenced by one specific value (Bardi & Schwartz, 2003). For example, caring for the environment requires an amount of universal thinking (self-transcendence), and often comes with negative impact on individual gain (self-enhancement) (e.g., Steg & de Groot 2012). This leads to the conclusion that the most relevant values in Schwartz Value Theory regarding PEB, are the ones on the dimension of self-transcendence (universalism and benevolence) vs. self-enhancement (power and achievement). Self-transcendent values have been shown to be positively significant in direct relation to PEB in the form of, among others, donation to charity (de Groot & Steg, 2008) and energy use reduction (Steg et al., 2011).

Researchers in environmental psychology wanted to further distinguish between self-transcendent values concerned with nature and the environment; and those explicitly oriented towards humans (e.g., Stern, Dietz & Kalof, 1993). Based on the research made by Schwartz (1977, 1992); a threefold categorization was made by equating self-enhancement with *egoistic*; self-transcendent towards humans with *altruistic* (or *anthropocentric*); and self-transcendent toward nature and the environment with *biospheric* (or *ecocentric*) (e.g., de Groot & Steg, 2008; Stern, Dietz & Kalof, 1993). In some cases, the borderline value of hedonism in the self-enhancement dimension, has also been added as a fourth value orientation: *hedonic* (Steg et al. 2012). These values have been described in the terms of *value orientations*, since they are studied specifically as driving forces towards a desired goal (de Groot & Steg 2008). The value orientations have been shown to influence in which

kind of PEB an individual is likely to engage, for example positive links between civil disobedience and altruistic values, and between environmental lobbying and egoistic values (Sloot et al. 2018). Studies also showed that the altruistic and biospheric value orientations were differently, strongly, and uniquely related to general and specific environmental beliefs and behavioral intentions, especially when the goals conflicted with each other (de Groot & Steg 2008, Steg et al. 2011). The most stable impact on PEB is achieved through altruistic and biospheric values, although some PEB can also be performed based on egoistic values, therefore PEB can best be promoted through increasing the saliency of biospheric and altruistic values in relation to egoistic values or by making the behavior compatible with egoistic values (de Groot & Steg 2009).

4.2 The process of values influencing PEB

What is the process behind these values impacting PEB? Two influential theories are introduced: *Norm-Activation Model* (*NAM*) and *Value-Belief-Norm Theory* (*VBN*).

Schwartz (1977) studied how values affect behavior, specifically altruistic behavior, and found that the process of impact is not always straightforward. A specific value might lead to a specific behavior for some, but not for everyone. The same value might even lead to opposite behaviors, depending on the mediating factors. He proposed that norms influence whether a value has impact on a behavior or not (be it action or inaction), and that the crucial part is that values must be activated in order to have this impact. This led to the Norm-Activation Model (NAM), which posits that individuals sense a moral obligation to perform altruistic behaviors, if they have integrated personal norms, based on values, related to this behavior AND those values are activated. The moral obligation is also tied to the individual's need for consistency and goal attainment, which creates a desire to behave value congruently. This theory has been tested and found to explain PEB in cases of consumer behavior, donating money and voting in elections, simultaneously distinguishing between environmental and altruistic values as motivation for behavior (Verplanken & Holland, 2002). The impact of norms on the value-behavior relationship has also been studied and the results show that there is reason to believe that values do affect behavior, but that some values affect behavior more than others (Bardi & Schwartz, 2003).

NAM was also used to study recycling behavior, which led to further research of the value-behavior relation and creation of a theory focused on attitudes, behavior and contextual factors (ABC-theory) (Guagnano et al. 1995). This theory in turn inspired Stern and his colleagues (Stern, 2000; Stern, et al., 1999; Stern et al., 1993) to form the Value-Belief-Norm theory (VBN). They used the threefold categorization of values mentioned in the previous section; egoistic, (social-)altruistic and biospheric. VBN is a continuation of NAM in that it proposes that "the consequences that matter in activating personal norms are adverse consequences to whatever the individual values" (Stern, 2000, p. 413). This is relevant particularly for PEB, since it asserts that values lead to PEB through a causal chain of other factors, such as environmental beliefs and ascribed responsibility, which are more explicitly related to environment, and thus positioned "closer" to the PEB than values (Stern, 2000). This has been tested, for example, with PEB in the form of donation intentions and the results have shown unique significant positive relations between altruistic values leading to humanitarian donations and biospheric values leading to environmental donations (de Groot & Steg, 2008). However, values have been shown to have a direct effect even when beliefs and attitudes are controlled for, which goes against the logic of the VBN (Steg et al. 2011). Whatever the process, it is clear that in general, self-transcendent values have a positive effect on PEB and self-enhancement values have a negative effect on PEB.

5 GENDER AS PREDICTOR OF VALUES AND PEB

So far, it has been shown how values influence PEB and only briefly mentioned that demographic variables also can influence this relation. The aim of this thesis is to use the research on values and PEB as a base from which to explore the effect of a demographical variable; gender, on PEB. Gender among other demographical variables (e.g., age, education, and place of residence) have been shown to be influential antecedents of PEB (Gifford & Nilsson, 2014) and values (Schwartz, 1994; Schwartz & Rubel 2005). However, the relation between gender, values and PEB has not yet been widely tested and it is crucial to gain more knowledge of these associations.

5.1 The role of gender

Gender differences do exist and even if they are generally small, they seem to be quite consistent (Zelezny et al., 2000). The prevailing, convenient and common way to classify gender in surveys and large quantitative studies is to use the binary categories of *male* and *female*. This is why gender, in the ESS8 is based only on what is registered in the national Finnish Population Information System and that is the premise for this thesis. This does not account for the intricacy of gender, which is more than the sex a person is assigned at birth or the label they have in national databases. What lies behind the gender differences is in many ways more complex than what is within the scope of this thesis, and so the issue is left for the discussion.

In much social psychological research, as in the one presented in this thesis, there is assumed causality, since gender, generally, is a personal factor defined very early in life. This makes it an antecedent of both values and PEB and especially interesting for comparisons between men and women, two mutually exclusive groups.

The gender differences in values, although small, show that women tend to prefer benevolence and universalism values, which comprise the self-transcendence dimension; whereas men tend to bend more toward power, hedonism, and achievement, which comprise the self-enhancement dimension (Schwartz & Rubel, 2005; Schwartz & Rubel-Lifschitz, 2009). Even in the more detailed definitions of Schwartz's values; power–dominance was revealed to be more important to men than to women; while benevolence–caring and universalism– concern values were more important to women than to men (Schwartz et al., 2012). The same results have also been obtained using other value categories, showing that women rank altruism as more important than men do, potentially leading to gender differences in environmentalism (Dietz, Kalof & Stern, 2002).

Similar gender differences have been shown in relation to believing whether climate change is real or not: the majority (63.4%) of "climate believers" were female and this group also had the most self-transcendent values; in contrast, the majority (54.2%) of "climate sceptics" were male and had significantly lower self-transcendence values (Milfont et al., 2015). Women have more climate change knowledge than men do, but they also underestimate their knowledge more (McCright, 2010). Likewise, women have more

environmental concern (Stern, Dietz & Kalof, 1993) and stronger environmental attitudes and behaviors than men (Zelezny, Chua & Aldrich 2000). The logical next step then, is to form a question on how gender, values and PEB are related.

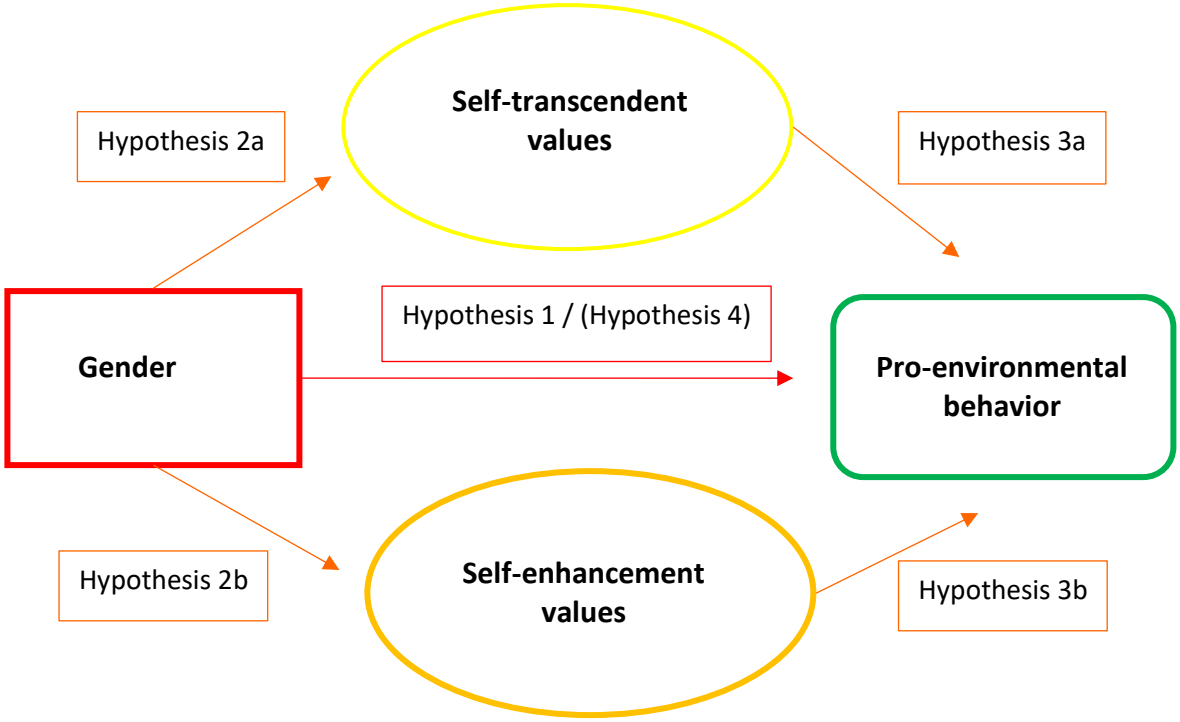
5.2 Research questions and hypotheses

My thesis focuses on gender differences in personal values predicting pro-environmental behavior. As we have already seen, previous research has shown that gender influences personal values, most commonly so that women (on average) tend to have more self-transcendent values, whereas men (on average) have more self-enhancement values (Zelezny, Chua & Aldrich, 2000). In addition, self-transcendent values have been shown to be positively correlated, and self-enhancing values are negatively correlated, with pro-environmental behavior (e.g., Steg & de Groot, 2012). Gender can therefore be seen as an antecedent for values that either promote or inhibit pro-environmental behavior. This indicates that values may have a mediating role in predicting pro-environmental behavior, which is the focus of this thesis.

My research questions are: Do women (on average) behave more pro-environmentally than men (on average)? Is this difference in behavior due to differences in values?

Figure 2

Conceptual Diagram of Hypotheses for Study



Note. Total model represents hypothesis 4.

Hypotheses:

1. Women will report higher pro-environmental behavior and behavior intention than men.
2. Women will have higher self-transcendence (2a) and lower self-enhancement (2b) values than men.
3. Self-transcendent values will relate to higher levels of reported pro-environmental behavior (3a) and self-enhancement values to lower levels of reported pro-environmental behavior (3b).
4. Self-transcendent and self-enhancement values will mediate the effect of gender on pro-environmental behavior.

6 METHOD

In the following section, the methodology of the study is presented. The European Social Survey as data material, the application of mediation analysis and the measures used in this study are introduced.

6.1 Data and participants: The European Social Survey

The European Social Survey (abbr. ESS) is "an academically driven cross-national survey that has been conducted across Europe since its establishment in 2001." (ESS, n.d.-a). On the official ESS website, (www.europeansocialsurvey.org), there is extensive information about their findings, methodology, data and documentation, and even pages for learning how to utilize the data. All data material, gathered since the first round of the survey, is free to download for non-commercial purposes. The survey, which is conducted every other year, measures attitudes, beliefs, and behavior patterns in national cross-sectional samples. So far, there have been 9 rounds of the ESS, the latest being gathered in 2018, with increasing numbers of participating countries. The ESS is managed by the European Social Survey European Research Infrastructure (ESS ERIC) and their main aims include; charting change in social structures, achieving and spreading higher standards of research, facilitating the training of researchers and improving the outreach of data on social change (ESS, n.d.-a). In general, the participating countries fund the survey themselves, each according to their GDP, but the latest rounds of the ESS were also partly funded by the European Commission.

In 2016, the data for ESS round 8 was gathered through individual face-to-face interviews with respondents in 30 European countries. The ESS procedure is based on a source questionnaire, divided into a core section and a rotating section. For every round, a new source questionnaire is developed based on the previous questionnaires, with the same core section and one or two rotated sections or a new section. The reason for choosing specifically the ESS8 for this thesis, is that it included a unique new module of questions on climate change and energy supply, which has not yet been replicated in later rounds.

For the purpose of this thesis, data was also limited to the Finnish national sample. Finland has participated in every round of the ESS, since the first in 2002. The survey

questionnaire is first designed in British English and then translated by the national teams to languages spoken by more than 5% of the population in their country, thus it was translated both to Finnish and Swedish in Finland. The translation also includes reformulating questions to fit the current situation in the country, e.g. updating names of political parties. Interestingly, the PVQ used to measure values in the ESS, shows how language can create an unexpected difference between nations: in English the questionnaire is provided in two versions; one with “he/him/his”, one with “she/her/hers”, whereas in Swedish they are combined into one questionnaire, read out by the interviewer according to the gender in question. In Finnish there is no grammatical gender difference in personal pronouns and thus there is only one version of the questionnaire. Implications of this are observed in the discussion.

The Finnish sample adhered to these key principles (ESS, n.d.-b):

- It is representative of all persons aged 15 and over, residing in a private household in the country in question, regardless of their nationality, citizenship or language.
- The sample selection was done through strict random probability. Sample frames of individuals, addresses or households may be used and in this case, a sample frame of individuals from the registry of the Finnish Population Information System, was used.
- All countries with populations over 2 million must aim for a minimum “effective achieved sample size” of 1500, which was achieved in Finland with 1925 respondents comprising the net sample size. In Finland, the sampling procedure also included a stage of implicit stratification.

The procedures of the ESS in Finland are funded by Academy of Finland, supervised by University of Turku (UTU), and Statistics Finland conducts the survey interviews (UTU, n.d.). The fieldwork of the survey is conducted in the form of individual interviews in the respondents’ homes, where the questionnaire is filled out digitally through structured showcards with predefined scales. The data is then processed and archived according to the ESS Data Protocol with the aims of producing user-friendly, reliable and high-quality data.

Research ethics are of course elemental to any study. The ESS is always conducted in accordance with the highest ethical research standards, following the Declaration on Professional Ethics of the International Statistical Institute (ISI, 2020), which includes principles on objectivity, transparency and confidentiality to name a few. For this thesis only the finalized material, i.e. an anonymous, quantitative dataset, was accessed and therefore the main concerns are with integrity of the discipline, accuracy of analysis and confidence in results. Fortunately, the ESS provides aids for this, such as precalculated weights for the material that correct for unequal probabilities of selection in the sampling design.

6.2 Analysis procedure: testing mediation

Based on the theory and previous research cited above, I have proposed that values have a mediating role in predicting the effect of gender on PEB. When analyzing mediation, the direction of the mediation needs to be based on theory and previous research (Hayes, 2018). According to Kenny (2018), a mediation of this kind has three paths:

a – between predictor and mediator;

b – between mediator and outcome; and,

c’ – between predictor and outcome.

This indicates that

a) there is a direct association between gender and values;

b) there is a direct association between gender and PEB; and,

c) the direct association between gender and PEB is reduced or rendered non-significant, when values are included.

In order to test these associations on the ESS8 material, statistical procedures were performed with the help of a widely used statistics software program called IBM SPSS Statistics (SPSS originally standing for Statistical Package for the Social Sciences, Field, 2013). For determining statistical significance, this thesis uses a 95 % confidence interval, which means that the common limit of $p > .05$ is a good reference for whether the hypotheses are supported or not.

The material was prepared for analysis (see Appendix 1 for details) by removing irrelevant data (unused variables), checking the coding of the relevant variables and in some cases recoding them (see section 6.3). In accordance with recommendations from ESS (ESS, n.d.-d), a filter variable was used in the recoding of the value variables, which removed respondents with too many missing or indiscriminate answers on the value items. This changed the amount of cases from 1925 to 1896, i.e. deleting 29 cases. These changes also reduced the amount of missing answers in the other variables, indicating that respondents failing to answer questions on values had also failed to answer some of the questions on demographics and behaviors. The last preparation was implementing design weight on the data. Hierarchical stepwise regression analyses were conducted to determine the effect of gender on PEB and the effect of gender on values. Finally, the indirect effect of gender on PEB through values, is tested through mediation analyses using PROCESS macro, a sort of extension for SPSS (Hayes, 2018).

6.3 Measures

In the following section, the relevant variables are presented, as well as how they were measured, coded and in some cases recoded.

6.3.1 Gender (predictor variable)

Data for this variable was resourced from the Finnish national Population Information System, which only provides two categories. Gender is a categorical, binary variable, originally coded as 1 = *male*; 2 = *female*; and 9 = *no answer*; however there were no missing values in this variable. In order to better use this variable in correlation and regression analyses it was recoded to 0 = *male*; 1 = *female*.

6.3.2 Values (mediator)

In order to assess values, the ESS8 uses the Portrait Values Questionnaire (PVQ) with 21 items measured on a 6-point-scale ranging from 1 = *very much like me* to 6 = *not like me at all*. The analyses focus on the dimension of self-transcendence values (ST) and self-enhancement values (SE). ST values is comprised of the values benevolence (BE) and

universalism (UN), while SE values is comprised of the values power (PO) and achievement (AC). The items for measuring BE, UN, PO and AC are shown in Table 1.

Table 1. *Items for measurement of power, achievement, benevolence and universalism values (ESS, n.d.-c)*

VALUE	Variable name in data and description
BENEVOLENCE Preservation and enhancement of the welfare of people with whom one is in frequent personal contact.	• **Iphlppl**: It is very important to him to help the people around him. He wants to care for their well-being. • **Iplylfr**: It is important to him to be loyal to his friends. He wants to devote himself to people close to him.
UNIVERSALISM Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.	• **Ipeqopt**: He thinks it is important that every person in the world should be treated equally. He believes everyone should have equal opportunities in life. • **Ipudrst**: It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them. • **Impenv**: He strongly believes that people should care for nature. Looking after the environment is important to him.
POWER Social status and prestige, control, or dominance over people and resources.	• **Imprich**: It is important to him to be rich. He wants to have a lot of money and expensive things. • **Iprspot**: It is important to him to get respect from others. He wants people to do what he says.
ACHIEVEMENT Personal success through demonstrating competence according to social standards.	• **Ipshabt**: It is important to him to show his abilities. He wants people to admire what he does. • **Ipsuces**: Being very successful is important to him. He hopes people will recognize his achievements.

The preparation of all value items followed a recommended procedure found at ESS (ESS, n.d.-d). This included erasing missing values through a filter variable, reversing the measurement scale (1 to 6, 2 to 5 etc.), indexing the items into the ten basic values and centering them. Creating centered value scores is important since respondents might be using the scale in different ways and we are interested in their subjective value priorities, not a comparison between subjects. Centering was done by calculating a mean score on all answered value items for each respondent and then using this together with the index variables to get the centered value scores. Finally, the higher-order values, i.e. self-transcendence and self-enhancement, were computed. These two variables are calculated as the mean of the items they consist of, i.e. ST uses the centralized scores of the items on BE and UN, and SE uses the centralized scores of the items on PO and AC. Cronbach's alpha for the items on BE and UN was $\alpha = 0.66$ and for the items on PO and AC was $\alpha = 0.74$; the variables are therefore reliable and can be used to comprise the higher-order value variables of ST and SE.

6.3.3 Pro-environmental behaviors (outcome variables)

Two items in the module on climate change and energy in the ESS8 were used to measure PEB. Item 1 explores habitual, general energy use reduction, which makes it a PEB defined by impact. This behavior is henceforth referred to as *energy use reduction*. Item 2 explores a hypothetical situation of energy efficiency through a consumer behavior (i.e. buying an appliance), which makes it a PEB defined by intention. This behavior intention is henceforth referred to as *energy efficiency*.

1) *Energy use reduction*

"There are some things that can be done to reduce energy use ('energy use' in the broadest possible sense, not only electricity), such as switching off appliances that are not being used, walking for short journeys, or only using the heating or air conditioning when really needed. In your daily life, how often do you do things to reduce your energy use?"

Answers were given on a scale from 1 = *never* to 6 = *always*. Besides two answers in the missing values category of 88 = *I don't know*, this item also included a value for not being able to reduce energy; 55 = *cannot reduce energy use*. There were five answers with this value, which were recoded as missing (99 = *no answer)* since it does not reflect the respondent's pro-environmental behavior. The total of missing values then became seven.

2) *Energy efficiency*

"If you were to buy a large electrical appliance for your home, how likely is it that you would buy one of the most energy efficient ('energy efficient' in the sense of 'using less energy') ones?"

Answers were given on a scale from 0 = *not at all likely* to 10 = *extremely likely*. No recoding was needed. There were twelve missing values.

6.3.4 Covariates

As covariates, variables on age, education and place of residence were included in the analysis. Age of respondent was already recoded as full years, as was the variable on education ("Years of full-time education completed"), so no recoding was necessary. Place of residence was originally coded in five categories; 1 = *a big city*, 2 = s*uburbs or outskirts of big city*, 3 = *town or small city*, 4 = *country village*, 5 = *farm or home in countryside*. Categories 1, 2 and 3 were recoded as *urban* and categories 4 and 5 as *rural*, in order to better fit the use of linear regression analyses. The final variable had two categories (0 = *urban*, 1 = *rural*) and one missing value category (9), though there were only two missing values.

7 RESULTS

7.1 Descriptive statistics and correlations

The descriptive statistics and correlations for all variables are presented in Table 2. The results show that half of the sample was female, and half was male, there were slightly more “urban” than “rural” residents, mean age was almost 50 years and the average length of total education was close to 14 years. Both behaviors had an average closer to the maximum, 4.21 for energy use reduction (max 6) and 7.87 for energy efficiency (max 10). Self-transcendent values had a high average of 5, which is almost up to maximum, while self-enhancement had an average closer to the minimum, 2.96 (min 1, max 6).

The correlations show that being female was positively correlated with age ($r = .06$, $p < .05$), education ($r = .09$, $p < .01$), energy use reduction ($r = .07$, $p < .01$), energy efficiency ($r = .06$, $p < .05$), self-transcendent values ($r = .20$, $p < .01$) and negatively correlated with self-enhancement values ($r = -.19$, $p < .01$). Energy use reduction was positively correlated with self-transcendence values and negatively with self-enhancement values. Energy efficiency was positively correlated with self-transcendence values. See Table 2 for more detailed statistics on correlations between all variables.

Table 2

Descriptive Statistics and Pearson Correlations (r) for Study Variables

Variable	*n*	*M*	*SD*	1	2	3	4	5	6	7	8
1. Gender	1896	.50	.50	—							
2. Place of residence	1896	.37	.48	-.01	—						
3. Age	1896	49.89	18.84	.06*	.13**	—					
4. Education	1891	13.82	4.01	.09**	-.22**	-.24**	—				
5. Energy use reduction	1889	4.21	1.03	.07**	-.01	.11**	.05*	—			
6. Energy efficiency	1884	7.87	2.10	.06*	-.03	.11**	.11**	.28**	—		
7. ST	1896	5.00	.59	.20**	-.12**	.02	.11**	.23**	.18**	—	
8. SE	1896	2.96	.95	-.19**	-.14**	-.30**	.10**	-.11**	-.04	-.00	—

Note. Gender (0= *male*, 1= *female*), Place of residence (0= *urban*, 1= *rural*), Education (full years), Energy use reduction (1 = *never* to 6 = *always)*, Energy efficiency (0 = *not at all likely* to 10 = *extremely likely*), ST & SE (1 = *very much like me* to 6 = *not like me at all*).

Significance of Pearson correlations between variables: *$p < .05$; **$p < .01$; *** $p < .001$.

7.2 Regression analyses

In order to test hypotheses, several hierarchical multiple regression analyses were conducted. Before that a number of preliminary analyses were made to ensure there were no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity in the material (see Appendix 2 for details on preliminary analyses and Appendix 3 for details on regression analyses).

7.2.1 Regression predicting the direct effect of gender on PEB

The first two regression analyses tested hypothesis 1, which states that "women will report higher pro-environmental behavior (*energy use reduction*) and behavior intention (*energy efficiency*) than men". This assesses the direct effect of gender and covariates on PEB, i.e. path *c'* of the mediation model. The analyses also showed indications regarding hypothesis 4, stating that ST values and SE values will mediate the effect of gender on PEB. In these regression analyses the first step included only gender and the variable for PEB, second step added covariates and third step added ST and SE.

The first regression analysis used energy use reduction as outcome variable. Step 1, including only gender, explained 0.5 % of the variance in energy use reduction and the effect of gender was $B = .07$, $p < .01$, a small positively significant direct effect supporting hypothesis 1. After entry of covariates (age, education, place of residence) at step 2, the explained variance increased to 2 % ($p < .001$). After entry of ST and SE at step 3, the total variance explained by the model as a whole was 7.2 % ($p < .001$) and the R^2 change = .05, $p < .001$. In the final model, age ($B = .09$, $p < .001$), education ($B = .06$, $p < .05$), ST ($B = .23$, $p < .001$) were positively significant predictors of higher energy use reduction behavior and SE ($B = -.08$, $p < .01$), was negatively significant. Gender was not significant anymore (see Table 3). This indicates a potential mediation, supporting hypothesis 4.

Table 3. Hierarchical regression results for gender, self-transcendent and self-enhancement values predicting energy use reduction (N = 1883)

Model	Unstandardized Coefficients		Standardized Coefficients				
	B	*SE B*	*B*	Ajd. R^2	*F* (*df1, df2*)	R^2 change	*F*change (*df1, df2*)
Step 1				.005**	10.10 (1, 1882)	.005**	10.10 (1, 1882)
Gender	.15	.05	.07**				
Step 2				.020***	10.37 (4, 1879)	.016***	10.41 (3, 1879)
Gender	.12	.05	.06**				
Age	.01	.00	.12***				
Education	.02	.01	.07**				
Place of residence	-.02	.05	-.01				
Step 3				.072***	25.20 (6,1877)	.053***	53.70 (2, 1877)
Gender	.00	.05	.00				
Age	.01	.00	.09***				
Education	.02	.01	.06*				
Place of residence	.02	.05	.01				
ST	.39	.04	.23***				
SE	-.09	.03	-.08***				

Note. Gender (0= *male*, 1= *female*), Place of residence (0= *urban*, 1= *rural*), Education (full years), Energy use reduction (1 = *never* to 6 = *always)*, Energy efficiency (0 = *not at all likely* to 10 = *extremely likely*), ST & SE (1 = *very much like me* to 6 = *not like me at all*).

*$p < .05$; **$p < .01$; *** $p < .001$.

The second regression analysis used energy efficiency as outcome variable. Step 1, including only gender, explained 0.3 % of the variance in energy efficiency and the effect of gender was $B = .06$, $p < .05$, a small positively significant direct effect supporting hypothesis 1. After entry of covariates (age, education, place of residence) at step 2, the explained variance increased to 3.3 % ($p < .001$). After entry of ST and SE at step 3, the

total variance explained by the model as a whole was 5.6 % ($p < .001$) and the R^2change = .024, $p < .001$. In the final model, age ($B = .14$, $p < .001$), education ($B = .13$, $p < .001$) and ST ($B = .16$, $p < .001$) were positively significant predictors of higher energy efficiency intentions. Gender was not significant anymore (see Table 4). This indicates a potential mediation through ST, but not SE, partially supporting hypothesis 4.

Table 4. Hierarchical regression results for gender, self-transcendent and self-enhancement values predicting energy efficiency ($N = 1878$)

Model	Unstandardized Coefficients		Standardized Coefficients				
	B	*SE B*	*B*	Ajd. R^2	*F* (*df1, df2*)	R^2 change	*F*change (*df1, df2*)
Step 1				.003*	6.28 (1, 1877)	.003*	6.28 (1, 1877)
Gender	.24	.10	.06*				
Step 2				.033***	16.97 (4, 1874)	.032***	20.47 (3, 1874)
Gender	.15	.10	.04				
Age	.02	.00	.15***				
Education	.07	.01	.14***				
Place of residence	-.10	.10	-.02				
Step 3				.056***	19.60 (6,1872)	.024***	24.03 (2, 1872)
Gender	.01	.10	.00				
Age	.02	.00	.14***				
Education	.07	.01	.13***				
Place of residence	-.03	.10	-.01				
ST	.57	.08	.16***				
SE	-.03	.05	-.02				

Note. Gender (0= *male*, 1= *female*), Place of residence (0= *urban*, 1= *rural*), Education (full years), Energy use reduction (1 = *never* to 6 = *always)*, Energy efficiency (0 = *not at all likely* to 10 = *extremely likely*), ST & SE (1 = *very much like me* to 6 = *not like me at all*).

*$p < .05$; **$p < .01$; *** $p < .001$.

7.2.2 Regression predicting the direct effect of gender on values

Two further regression analyses were conducted to test hypothesis 2; “Women will have higher self-transcendence (2a) and lower self-enhancement (2b) values than men”. This assesses the direct effect of gender and covariates on ST values and SE values, i.e. path *a* of the mediation model. This was done and separately for each value, in two steps, first with only gender as predictor and then with covariates added.

The first regression analysis used self-transcendence values as outcome variable. Step 1, including only gender, explained 4.1 % of the variance in ST and the effect of gender was $B = .20$, $p < .001$ a positively significant direct effect. After entry of covariates (age, education, place of residence) at step 2, the total variance explained by the model as a whole was 5.8 % ($p < .001$) and the R^2 change = .018, $p < .001$. In the final model, gender ($B = .19$, $p < .001$) and education ($B = .08$, $p < .01$) were positively significant predictors of higher ST and place of residence ($B = -.10$, $p < .001$) was negatively significant (see Table 5). The results of both step 1 and 2 show a positively significant direct effect between being female and higher ST, which supports hypothesis 2a.

Table 5.
Hierarchical regression results for gender predicting self-transcendent values (N = 1890)

Model	Unstandardized Coefficients		Standardized Coefficients				
	B	*SE B*	*B*	Ajd. R^2	*F* (*df1, df2*)	R^2 change	*F*change (*df1, df2*)
Step 1				.041***	81.41 (1, 1889)	.041***	81.41 (1, 1889)
Gender	.24	.03	.20***				
Step 2				.058***	29.92 (4, 1886)	.018***	12.27 (3, 1886)
Gender	.23	.03	.19***				
Age	.00	.00	.04				
Education	.01	.00	.08***				
Place of residence	-.13	.03	-.10***				

Note. Gender (0= *male*, 1= *female*), Place of residence (0= *urban*, 1= *rural*), Education (full years), *$p < .05$; **$p < .01$; *** $p < .001$.

The last regression analysis used self-enhancement values as outcome variable. Step 1, including only gender, explained 3.6 % of the variance in SE and the effect of gender was $B = -.19$, $p < .001$ a negatively significant direct effect. After entry of covariates (age, education, place of residence) at step 2, the total variance explained by the model as a whole was 13 % ($p < .001$) and R^2change = .095, $p < .001$. In the final model, age ($B = -.27$, $p < .001$), gender ($B = -.18$, $p < .001$) and place of residence ($B = -.10$, $p < .001$) were negatively significant (see Table 6). The results of both step 1 and 2 show a negatively significant direct effect between being female and higher SE, which supports hypothesis 2b.

Table 6.
Hierarchical regression results for gender predicting self-enhancement values (N = 1890)

Model	Unstandardized Coefficients		Standardized Coefficients				
	B	*SE B*	*B*	Ajd. R^2	*F* (*df1*, *df2*)	R^2 change	*F*change (*df1*, *df2*)
Step 1				.036***	70.97 (1, 1889)	.036***	70.97 (1, 1889)
Gender	-.36	.04	-.19***				
Step 2				.130***	71.42 (4, 1886)	.095***	69.02 (3, 1886)
Gender	-.34	.04	-.18***				
Age	-.01	.00	-.27***				
Education	.01	.01	.03				
Place of residence	-.19	.04	-.10***				

Note. Gender (0= *male*, 1= *female*), Place of residence (0= *urban*, 1= *rural*), Education (full years), *$p < .05$; **$p < .01$; *** $p < .001$.

7.3 Mediation analyses

The mediation analyses tested hypothesis 4, stating that ST values and SE values will mediate the effect of gender on PEB. The analyses were executed with a macro for SPSS called PROCESS (Hayes, 2017), since this is a newer, more efficient way to test mediation. This method uses bootstrapping in the calculation of a 95% confidence interval for the indirect effect, which is necessary, because indirect effects do not have a standard error or normal distribution and can therefore not be t-tested. The direct effects, which are also calculated, do not have this problem and will have a *p*-value. After fitting a model to the data using PROCESS, results for all effects are reported: a) direct effects of gender on values and PEB, b) direct effects of values on PEB, and c) indirect, mediated effect of gender on PEB. Mediation analyses were first executed excluding covariates and then including covariates, with the purpose of testing robustness of findings. Separate

calculations were performed, and separate results are reported for each of the PEBs. The final mediation models are also conveyed as conceptual figures.

7.3.1 Mediation models excluding covariates

The model for indirect effect of gender, mediated by ST and SE, explained 6.6% of the variance in energy use reduction, $R^2 = .066$, $F(3, 1885) = 44.08$, $p < .001$. Women reported more ST than men ($B = .24$, $p < .001$) and men reported more SE than women ($B = -.36$, $p < .001$), which supports hypotheses 2a and 2b. ST had a significant positive effect on energy use reduction ($B = .40$, $p < .001$) and SE had a significant negative effect on energy use reduction ($B = -.11$, $p < .001$)), which supports hypotheses 3a and 3b. The direct effect of gender on energy use reduction ($B = .01$, $p > .05$) was not significant when values were included as mediators. The indirect effect of gender on energy use reduction was significant both through ST, $B = .10$, 95% CI [.07, .13], and SE, $B = .04$, 95% CI [.02, .06]. Both the results of the direct effect and the indirect effect show a significant mediation through values and support hypothesis 4.

The model for indirect effect of gender, mediated by ST and SE, explained 3.4% of the variance in energy efficiency, $R^2 = .034$, $F(3, 1880) = 21.75$, $p < .001$. Women had more ST than men ($B = .24$, $p < .001$) and men had more SE than women ($B = -.36$, $p < .001$), which supports hypotheses 2a and 2b. ST had a significant positive effect on energy efficiency ($B = .62$, $p < .001$), but SE did not have a significant effect on energy efficiency ($B = -.09$, $p > .05$), which supports hypothesis 3a, but not 3b. The direct effect of gender on energy efficiency ($B = .06$, $p > .05$) was not significant when values were included as mediators. The indirect effect of gender on energy efficiency was significant through ST, $B = .15$, 95% CI [.10, .21], but not through SE, $B = .03$, 95% CI [-.01, .07]. Both the results of the direct effect and the indirect effect suggest a potential partial mediation and partly supports hypothesis 4.

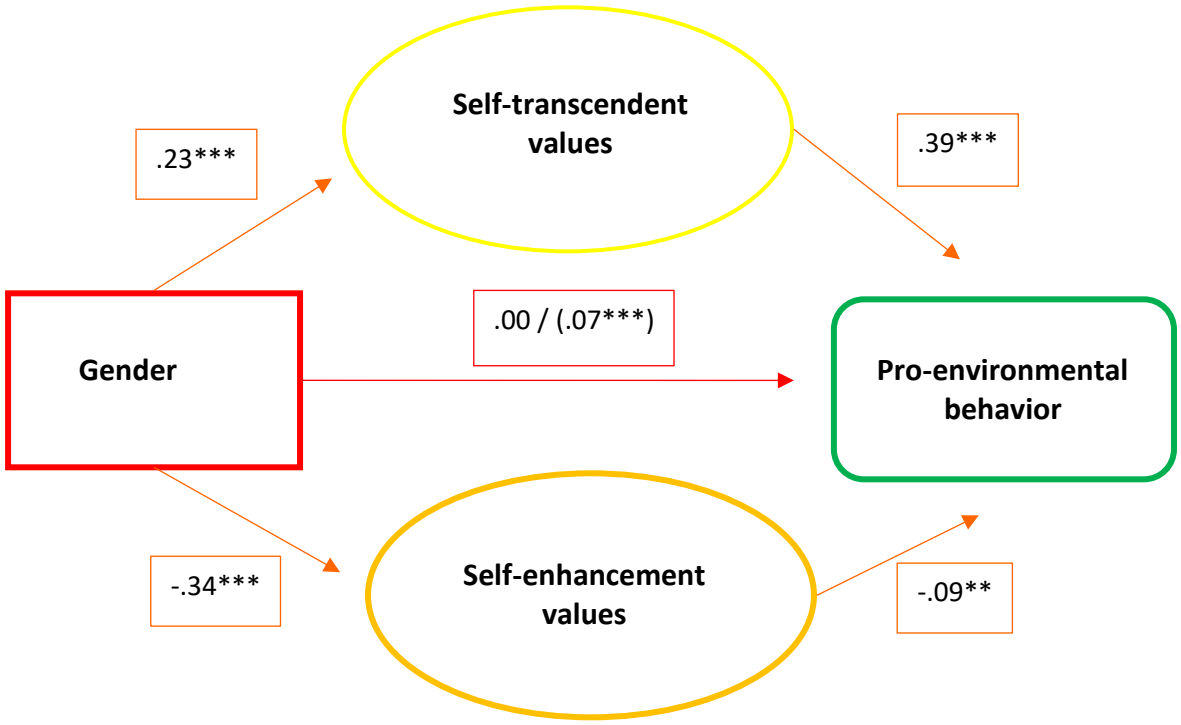
7.3.2 Final mediation models including covariates

To assess the robustness of findings in the mediation models, final mediation analyses were performed with all the variables, including covariates, again using the

PROCESS macro on SPSS. When age, education and place of residence were included in the model for indirect effect of gender on PEB, mediated by ST and SE, it explained 7.4% of the variance in energy use reduction, R^2 = .074, F(6, 1877) = 25.11, p < .001 and 5.8% of the variance in energy efficiency, R^2 = .058, F(6, 1872) = 19.34, p < .001. This was an increase from 6.6% in energy use reduction and 3.4% in energy efficiency, suggesting that covariates add to the variance in PEB explained by the indirect effect of gender.

Figure 3

Conceptual Diagram of Results of Mediation Analysis for Energy Use Reduction



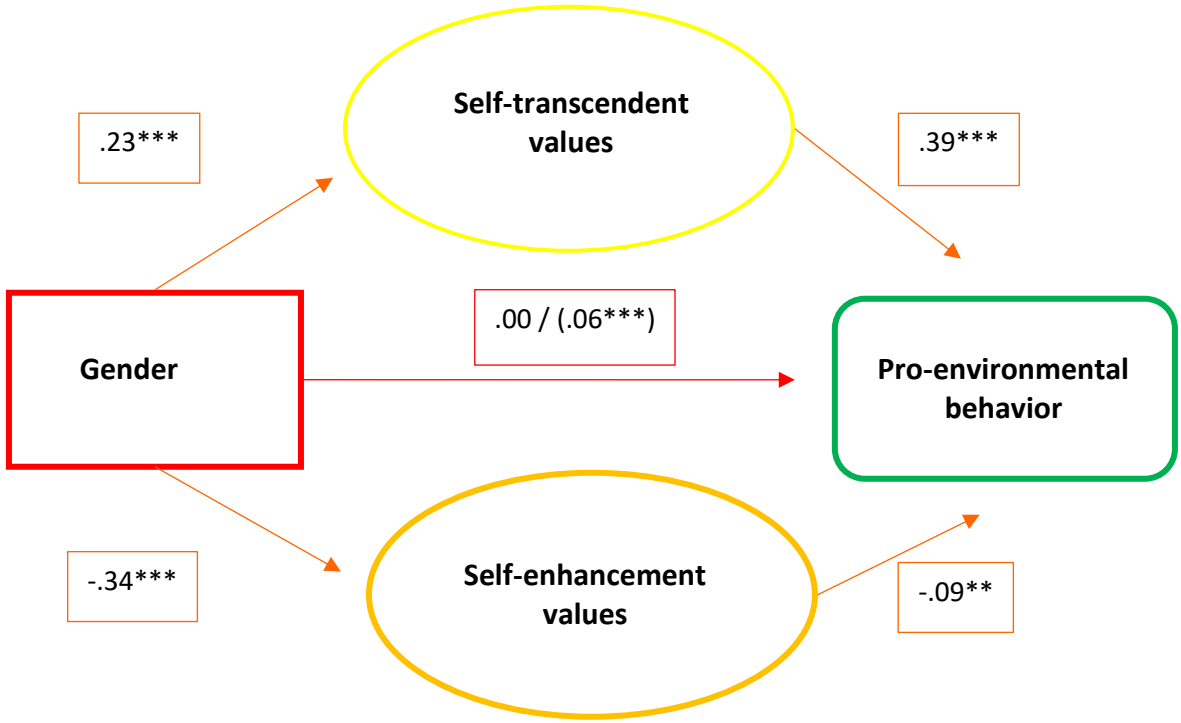
Note. The diagram displays results of direct effects (B) and, in parenthesis by direct effect of gender, the explained variance of indirect affect (R^2).

** = p < .01, *** = p < .001.

In the final model for energy use reduction (see Figure 3), the effect of gender on ST and SE was still significant when covariates were included, which supports hypotheses 2a and 2b. Education (B = .01, p < .01) and place of residence (B = -.12, p < .001) showed positively significant effects for ST, while age (B = -.01, p < .001) and place of residence (B = -.20, p < .001) showed negatively significant effects for SE. The effect of ST and SE on energy use reduction were significant, which supports hypotheses 3a and 3b. The direct effect of gender on energy use reduction was minimal and not significant when values and covariates were included in the model, which suggests a mediation. Age (B = .01, p < .001) and education (B = .02, p < .05) showed positively significant effects on PEB. The indirect effect of gender on energy use reduction, with covariates included, was significant through ST, B = .09, 95% CI [.06, .12] and SE, B = .03, 95% CI [.01, .05]. Both the results of the direct effect and the indirect effect show a significant mediation through values and support hypothesis 4.

Figure 4

Conceptual Diagram of Results of Mediation Analysis for Energy Efficiency



Note. The diagram displays results of direct effects (*B*) and, in parenthesis by direct effect of gender, the explained variance of indirect affect (R^2).
** = $p < .01$, *** = $p < .001$.

In the final model for energy efficiency (see figure 4), the effect of gender on ST and SE was still significant when covariates were included, which supports hypotheses 2a and 2b. Education ($B = .01$, $p < .01$) showed a positively significant effect for ST and place of residence ($B = -.12$, $p < .001$) showed a negatively significant effect for ST, while age ($B = -.01$, $p < .001$) and place of residence ($B = -.19$, $p < .001$) showed negatively significant effects for SE. The effect of ST on energy efficiency was positively significant, but the effect of SE was not significant, which supports hypothesis 3a, but not 3b. The direct effect of gender on energy efficiency was minimal and not significant when values and covariates

were included in the model, which suggests a mediation. Age (B = .02, p < .001) and education (B = .07, p < .001) showed positively significant effects on PEB. The indirect effect of gender on energy efficiency, with covariates included, was significant through ST, B = .13, 95% CI [.08, .18], but not through SE, B = .01, 95% CI [- .03, .05]. Both the results of the direct effect and the indirect effect suggest a potential partial mediation and partly support hypothesis 4. Possible explanations for this difference between energy use reduction and energy efficiency are included in the discussion.

8 DISCUSSION

The results from the analyses supported most hypotheses on the associations between gender, values and pro-environmental behavior (PEB). Below, the hypotheses are reviewed in the light of the fallout of the data analysis, followed by a discussion on results, restrictions and other relevant reflections.

Hypothesis 1, stating that women will report higher PEB (*energy use reduction*) and PEB intention (*energy efficiency*) than men, was supported through correlation and hierarchical regression results. There was a small, but significant difference between women and men in both how much energy use reduction they reported and their intensions for energy efficiency. This direct effect was mostly significant in the initial models, excluding mediators and covariates. This indicates that gender in and of itself has a direct effect on PEB. This is in line with studies by Zelezny, Chua and Aldrich (2000).

Hypothesis 2, that (a) women will have higher self-transcendence and (b) lower self-enhancement values than men, was supported both by the results of hierarchical regression analysis and mediation analysis and was sustained even when covariates were included in the model. What follows, is logically that men will have higher self-enhancement values and lower self-transcendence values than women. This is in alignment with previous research on the matter, indicating that gender has a direct effect on values (e.g., Schwartz & Rubel, 2005).

Hypothesis 3a, that self-transcendent values will relate to higher levels of reported PEB, was supported by the results of the mediation analysis for both reported energy use

reduction and intensions of energy efficiency. The results remained significant even when covariates were included in the models. This is in alignment with previous research on the matter indicating that self-transcendent values have a direct effect on PEB (e.g. Steg et al. 2011), meaning that the respondents in this sample with high self-transcendence values do behave in line with their values.

Hypothesis 3b, that self-enhancement values will relate to less PEB, was supported for reported energy use reduction, but not for intensions of energy efficiency. It is possible that this result is due to the inherent difference in the two measured behaviors. Energy use reduction is a habitual behavior, requiring intrinsic motivation and effort, often to the advantage of other's wellbeing. This would logically explain the negative relation between self-enhancement values and energy use reduction.

Intensions of buying an energy efficient appliance on the other hand, is a rarely occurring behavior often driven by external motivators and gain goals. Energy efficiency intentions are thus more materialistic and can be motivated by other values than pro-environmental ones, such as achievement and hedonism, which makes the connection between self-enhancement and this particular PEB even potentially positive. Nonetheless, in this study the results for energy efficiency were close to zero and not significant, while the results for energy use reduction are in alignment with previous research on the matter, indicating that self-enhancement values have a direct negative effect on PEB (e.g., Poortinga et al., 2004).

Hypothesis 4, stating that self-transcendent and self-enhancement values will mediate the effect of gender on PEB, was completely supported for energy use reduction and partially supported for energy efficiency intentions. The hierarchical regression and mediation analyses produced very similar results: the direct effect of gender on PEB became nearly zero and non-significant once mediators and covariates were included in the models. This in and of itself, indicates mediation. Closer analysis shows mediation of the effect of gender on energy use reduction through both self-transcendence and self-enhancement values, and mediation of the effect of gender on energy efficiency through self-transcendence values. The effect of gender on energy efficiency was not significantly mediated by self-enhancement values. The fact that values were still significant above the

effect of covariates indicates the robustness of the finding. There is thus indication that the effect of gender on PEB is explained by gender differences in values, creating an indirect effect of gender on PEB. This suggests that, in this Finnish sample, women, on average, had higher self-transcendence values and were performing more PEB and had higher intentions for PEB, than men on average.

In the following, I will further explore possible explanations for gender differences in values and behavior as well as problematization of the variables themselves and limitations of the study.

As conveyed in this study, gender differences are typically very small, but consistently significant, which indicates a real, underlying difference between men and women, whatever that may be. It is also known that the differences within these two groups tend to be greater than the differences between them, i.e. individual women differ more from each other, as do men from one another, than what the average woman differs from the average man. The most productive way of looking at these differences is therefore to go beyond the labels and question the underlying difference. What creates gender differences?

One purely methodological explanation is that stereotypical gender roles are activated through the Portrait Values Questionnaire (PVQ) used in the European Social Survey round 8 (ESS8), since is made gender specific (Schwartz & Rubel, 2005). This proposition can be true for English and probably for the way the PVQ is administered in Swedish in Finland. However, it is not true for the PVQ in Finnish since Finnish does not have separate gender pronouns and instead uses ‘hän’ to signify a person of any gender. This is not unique to Finland, but it is quite uncommon; therefore, this explanation might not hold true for the Finnish sample. It would be interesting to further analyze the Finnish sample as two groups: Finnish speakers and Swedish speakers, to see if the language makes a difference (with a risk of obtaining a very small sample of Swedish speakers).

As for theoretically, Schwartz and Rubel (2005) implicate evolutionary psychology and social role theory as explanations for gender differences in values. Their argumentation is undeniably heteronormative, placing people in a “close alliance of women and men in families” (Schwartz & Rubel, 2005, p. 1022) where women are under the influence of a husband’s values, “because men are usually the main family providers and women gain

from men's sharing of their resources" (Schwartz & Rubel, 2005, p. 1022). This is based on assumptions of evolutionary mating behavior, where women are innately more inclined to value benevolence, because of their role as caretakers; and men inherently favor power values, because of their role as providers. The argument continues that since women in more equal countries are less dependent on their providers, they will have more freedom to express their innate values and thus create greater gender differences in values than in less equal countries (Schwartz & Rubel, 2005; Schwartz & Rubel-Lifschitz, 2009). This has been studied and found to be accurate and in addition, both women and men are shown to place more importance on benevolence, universalism, self-direction, hedonism and stimulation values and less on the anxiety driven values of power, achievement, security, conformity and tradition (Schwartz & Rubel-Lifschitz, 2009). Presented in this way, gender equality seems to make the genders more diverse from each other, as well as making the whole population more inclined towards values generally associated with women and with growth. Finland is considered to be one of the more equal countries in the world, which can explain why environmental issues (connected to the value of universalism) are so predominant here. This argument also supports continued further efforts to promote gender equality in all countries for the sake of the environment. But then again, it might not be gender per se or gender equality that drive these changes in values, but other factors, such as more individual autonomy, wealth and education. These factors do not only give women the freedom to express values differing from their husbands, but the population in general is allowed greater value-expressive freedom. This in turn ties environmental values to human rights issues, global social justice and the fight against poverty.

Another prospective avenue is the one pertaining to gender differences caused by socialization and life experiences, e.g., women being taught to care for others from an early age (Dietz, Kalof & Stern, 2002). One study claims that gender differences in environmentalism are due to women's higher level of expressed empathy (Arnocky & Stroink, 2011), which also can be a result of the socialization process. If gender is considered from a more social constructionist perspective, it might not be the inherent parts of gender, but the socialized gender norms that people grow up to identify with, that result in different values. Perhaps these norms and fostering practices in themselves are predictive

of different values and variations in PEB. Instead of studying whether gender and values predict PEB, one could ask what kind of parenting best predicts PEB.

In the European Social Survey round 8 (ESS8) and the Finnish Population Information System, gender is still defined in binary categories, while the real-world situation is rapidly revealing the gender diversity that always has been around. The binary categorization is not only problematic in the way it obscures other gender expressions and the values linked to them, but also in that it might conceal the underlying reason for the gender differences. A call for social scientists to use indicators measuring masculinity and femininity along a continuum or even going straight to measuring feminist orientation instead of gender, is made by McCright (2010) and I fully agree that this would be a step in the right direction. In fact, a study using both binary gender and a scale on masculinity – femininity, showed that anthropocentrism was connected to gender and masculinity and ecocentrism was only connected to femininity (Calvo-Salguero et al., 2014). If we want to find out what is most influential in motivating PEB, it is not productive to study the population divided into two gender groups and generalize based on that. More research is needed on femininity and masculinity, as well as feminist orientations in relation to values and PEB.

One more limitation in this study, potentially effecting values more than the other variables, is that the data material is from 2016 and many things have changed by now. The political climate then was not as focused on environmental issues as it is today, not to mention the radical shifts in feelings of security that Finland (and the world) has experienced due to the pandemic of COVID-19. Parts of the data material from ESS9 is already available and ESS10 is under construction, but neither include questions regarding PEB and hence they have no answers on what the implications for PEB are. Longitudinal studies on environmental values and PEB would provide much needed knowledge of the stability and causality of this relation.

Causality is overall problematic, since the relationship between values and behavior has been shown to be moderated by a number of factors, e.g. locus of control, (Engqvist Jonsson & Nilsson, 2014), attitudes (Grunert & Juhl, 1995) and the personal importance of conformity values (Lönnqvist et al., 2006). The relational chain suggested in the hypotheses

in this thesis could have resulted in similarly significant results with a different order of variables, for example behavior affecting values. For the sake of the restricted scope of this thesis, moderating variables were dropped from the hypotheses and the analyses, although some such variables (e.g. belief in climate change) would have been available in the ESS8.

It is also important to note that since the self-transcendence and self-enhancement dimension encompasses several values, it is difficult to pinpoint exactly why they affected the two PEBs the way they did without further analyses. One explanation for the different effects they had on the two measured behaviors, is that different values have different relations to specific behaviors. The activity of reducing energy use is (as shown) more likely to be related to core values on the self-transcendence – self-enhancement dimension. The intention of buying an energy efficiency appliance on the other hand, is not as strongly bound by one's core identity, as there are more situational matters influencing the behavior and more potential value orientations involved. An energy efficient appliance could for example, be associated with material success and thus to achievement values; or it could be an issue of convenience and comfort, which are motivated by hedonism values (Steg et al., 2012). Including hedonism in the analysis could have yielded other kinds of results, but in an attempt to limit complexity, it was not included in self-enhancement values for this study. But then again, according to Schwartz et al. (2012) the ten basic values are often treated as discrete motivations yet should actually be seen as one alternative division of many on a continuum without clear boundaries and researches should feel free to use the partitioning most relevant to their questions, be it two, four, ten or nineteen.

Lastly, the limitations of using energy related behaviors to represent PEB. The first issue is methodological: ESS8 is a survey and can thus not directly measure the energy behavior of its respondents. As with all survey data, there is a risk pertaining to self-reports in that people may not be aware of their true motivations or they provide socially desirable answers (for whatever reason) (Steg et al. 2014).

As Whitmarsh (2009) indicates, energy behavior is not the best measure for PEB, since there are other very strong motives for this behavior, such as financial savings. Additionally, values are not the best predictors of PEB either (Poortinga et al., 2004; Whitmarsh 2009). Values might affect conscious choices and behaviors more than

unconscious ones, but some kinds of unconscious behaviors, such as habits, can also be affected by values, in good and bad (Bardi & Schwartz, 2003). For example, environmentally detrimental habits can be affected by values and become barriers hindering behavior change towards environmentally sustainable habits. The issues mentioned above are common problems for many forms of individual PEB, such as diet choices or consumer and waste behavior. There are countless variables affecting behavior, not only values and demographics, but also context and consequence, situational factors, attitudes, cultural norms etc. etc. It is impossible to control for everything and get a result that covers all aspects. This does not mean one should not try, and though the effects shown in the results of this study were rather small, they provide some significant evidence of factors influencing individual PEB. Therein lies the final catch, which brings me to the problematization of the research of PEB in the field of environmental psychology.

The origins of environmental psychology lie in the question of how physical settings and human actions interplay with each other and was born out of a need to contextualize a largely person-oriented psychology field (Schultz & Kaiser, 2012). This is very different from the kind of environmental psychology I have performed throughout this thesis, which is characteristic for the field today. The study of PEB has taken over much of environmental psychology and "research on these topics has drawn heavily on social psychological theories and methods,and blurred the boundaries between social and environmental psychology "(Schultz & Kaiser, 2012, p. 560). The study of individual PEB is also critiqued for trying to solve global environmental problems by influencing individuals, when the responsibility for solving them should be on bigger institutions, like governments. This claim is rebutted by three arguments on why knowledge about individual PEB is essential:

> Firstly, because there will always, no matter how effective policy measures, be a role for individual responsibility in a society. Secondly, collective and cultural practices are produced and reproduced by individual attitudes and behavior. It's therefore important to understand these processes that to a large degree shape society. Thirdly, this knowledge is not only important as a determinant of individual

> action, but also as an input when designing environment-related policies and interventions. (Engqvist Jonsson & Nilsson, 2014, p. 16-17)

Therefore, no study on PEB, however small, is done in vain. Knowledge on why, how, when and where we behave pro-environmentally, is important if we want to achieve motivated behavior change on a larger scale, which is the only way to ensure a continuation of human life on planet Earth.

Conclusion

The results show that, for the most part, gender and values both have direct effects on PEB, and gender also has an indirect effect on PEB, through values. Women do behave more pro-environmentally than do men and it is probably (in part) due to differences in values between the genders. This study has shown a sliver of what influences PEB assessed by two behaviors (energy use reduction and energy efficiency), which frankly is not enough. There is still much to explore on how to promote PEB, and we are running out of time.

In conclusion I would like to say that the impact of this thesis is marginal, as is any publication in the current paradigm of cumulative science, IF it is not of pragmatic use. In my opinion, there is little point in researching antecedents of behaviors if this knowledge is not applicable to a real-world context of behavior change, such as interventions or policy programs. The global challenges we are facing, require more than ample statistical evidence of the relations between different environmental, social and psychological factors. They require dynamic interaction with the non-scientific community, political engagement and tangible deeds towards a sustainable future. The results of my thesis will be more than numbers and words on a paper, because I will make sure that my actions speak louder than my words.

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APPENDIX 1

Syntax for data material preparation

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FREQUENCIES VARIABLES=rdcenr
  /ORDER=ANALYSIS.
*Recoding variable on energy reduction.
RECODE rdcenr (55=99).
EXECUTE.

*Recoding variable for gender.
RECODE gndr (1=0) (2=1) INTO newgndr.
VARIABLE LABELS  newgndr 'New recoded variable for gender'.
EXECUTE.

*Recoding variable for place of residence.
RECODE domicil (1 thru 3=0) (4 thru 5=1) (7 thru 9=9) INTO newdomic.
VARIABLE LABELS newdomic 'New domicile variable'.
EXECUTE.

*Computing filter variable for deleting cases based on missing values in
values section.
COMPUTE drop=0.
COUNT
count1 = ipcrtiv to impfun (1)/count2 = ipcrtiv to impfun (2)/count3 =
ipcrtiv to impfun(3)/
count4 = ipcrtiv to impfun (4)/count5 = ipcrtiv to impfun (5)/count6 =
ipcrtiv to impfun (6)/
countmis = ipcrtiv to impfun (SYSMIS,7,8,9).
if (max(count1 to count6)>16 or countmis>5) drop=1.
value labels drop 0 'keep' 1 'drop'.
EXECUTE.
*Unselected cases are deleted from the file.
FILTER OFF.
USE ALL.
SELECT IF(drop = 0).
EXECUTE.

*Reversing all value items and creating new variables.
RECODE
ipcrtiv imprich ipeqopt ipshabt impsafe impdiff ipfrule ipudrst ipmodst
ipgdtim impfree iphlppl ipsuces ipstrgv ipadvnt ipbhprp iprspot iplylfr
impenv imptrad impfun (1=6) (2=5) (3=4) (4=3) (5=2) (6=1) (7=7) (8=8)
(9=9)
INTO nipcrtiv nimprich nipeqopt nipshabt nimpsafe nimpdiff nipfrule
nipudrst nipmodst nipgdtim nimpfree niphlppl nipsuces nipstrgv nipadvnt
nipbhprp niprspot niplylfr nimpenv nimptrad nimpfun.
FORMATS nipcrtiv to nimpfun (f1.0).
VARIABLE LABELS
nipcrtiv 'Important to think new ideas and being creative'
nimprich 'Important to be rich, have money and expensive things'
nipeqopt 'Important that people are treated equally and have equal
opportunities'
nipshabt 'Important to show abilities and be admired'
```

```
nimpsafe 'Important to live in secure and safe surroundings'
nimpdiff 'Important to try new and different things in life'
nipfrule 'Important to do what is told and follow rules'
nipudrst 'Important to understand different people'
nipmodst 'Important to be humble and modest, not draw attention'
nipgdtim 'Important to have a good time'
nimpfree 'Important to make own decisions and be free'
niphlppl 'Important to help people and care for others well-being'
nipsuces 'Important to be successful and that people recognize
achievements'
nipstrgv 'Important that government is strong and ensures safety'
nipadvnt 'Important to seek adventures and have an exiting life'
nipbhprp 'Important to behave properly'
niprspot 'Important to get respect from others'
niplylfr 'Important to be loyal to friends and devote to people close'
nimpenv 'Important to care for nature and environment'
nimptrad 'Important to follow traditions and customs'
nimpfun 'Important to seek fun and things that give'.
VALUE LABELS nipcrtiv to nimpfun 1 "Not like me at all" 2 "Not like me" 3
"A little like me" 4 "Somewhat like me" 5 "Like me" 6 "Very much like me"
7 "Refusal" 8 "Don't know" 9 "No answer".
Missing values nipcrtiv to nimpfun (7 to 9).
EXECUTE.

*Create index variables for the ten basic values.
Compute Apow = MEAN (nimprich, niprspot).
Compute Apow = MEAN (nimprich, niprspot).
Compute Aach = MEAN (nipshabt, nipsuces).
Compute Ahed = MEAN (nimpfun, nipgdtim).
Compute Asti = MEAN (nimpdiff, nipadvnt).
Compute Aself = MEAN (nipcrtiv, nimpfree).
Compute Auni = MEAN (nipeqopt, nipudrst, nimpenv).
Compute Aben = MEAN (niphlppl, niplylfr).
Compute Atra = MEAN (nipmodst, nimptrad).
Compute Acon = MEAN (nipbhprp, nipfrule).
Compute Asec = MEAN (nimpsafe, nipstrgv).
EXECUTE.
VARIABLE LABELS
APow 'Power – mean of raw rating'
Aach 'Achievement – mean of raw rating'
Ahed 'Hedonism – mean of raw rating'
Asti 'Stimulation – mean of raw rating'
Aself 'Self-Direction – mean of raw rating'
Auni 'Universalism – mean of raw rating'
ABen 'Benevolence – mean of raw rating'
Atra 'Tradition – mean of raw rating'
ACon 'Conformity – mean of raw rating'
ASec 'Security – mean of raw rating'.
EXECUTE.

*Compute each individual’s mean score on all 21 value-items and call this
variable MRAT.
COMPUTE MRAT = Mean (nipcrtiv, nimprich, nipeqopt, nipshabt, nimpsafe,
nimpdiff, nipfrule, nipudrst, nipmodst, nipgdtim, nimpfree, niphlppl,
```

```
nipsuces, nipstrgv, nipadvnt, nipbhprp, niprspot, niplylfr, nimpenv,
nimptrad, nimpfun).
VARIABLE LABELS MRAT 'Mean score on all answered value items'.
EXECUTE.
*Compute centered value scores.
Compute Cpow = Apow - MRAT.
Compute Cach = Aach - MRAT.
Compute Ched = Ahed - MRAT.
Compute Csti = Asti - MRAT.
Compute Cself = Aself - MRAT.
Compute Cuni = Auni - MRAT.
Compute Cben = Aben - MRAT.
Compute Ctra = Atra - MRAT.
Compute Ccon = Acon - MRAT.
Compute Csec = Asec - MRAT.
EXECUTE.
VARIABLE LABELS
CPow 'Power - Centred value score'
Cach 'Achievement - Centred value score'
Ched 'Hedonism - Centred value score'
Csti 'Stimulation - Centred value score'
Cself 'Self-Direction - Centred value score'
Cuni 'Universalism - Centred value score'
CBen 'Benevolence - Centred value score'
Ctra 'Tradition - Centred value score'
CCon 'Conformity - Centred value score'
CSec 'Security - Centred value score'.
EXECUTE.

*RELIABLITY ANALYSIS – HIGHER-ORDER VALUES.
*Self-transcendence.
RELIABILITY
/VARIABLES= nipeqopt, nipudrst, nimpenv, niphlppl, niplylfr
/FORMAT=NOLABELS
/SCALE(ALPHA)=ALL/MODEL=ALPHA.
*Self-enhancement.
RELIABILITY
/VARIABLES= nimprich, niprspot, nipshabt, nipsuces
/FORMAT=NOLABELS
/SCALE(ALPHA)=ALL/MODEL=ALPHA.
*Logical maximum = 6, max is obtained when a respondent has answered 6 on
all the items indexing the HO value.
*Logical minimum = 1, min is obtained when a respondent has answered 1 on
all items indexing the HO value.
*Create higher-order values.
Compute Self_tr = Mean(niphlppl, niplylfr, nipeqopt, nipudrst, nimpenv).
Compute Self_en = Mean(nimprich, niprspot, nipshabt, nipsuces).
EXECUTE.
VARIABLE LABELS
Self_tr 'Self-transcendence'
Self_en 'Self-enhancement'.
EXECUTE.

WEIGHT BY dweight.
```

APPENDIX 2

Preliminary analyses

Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity.

The relations between the predictor variables, mediator variables and the outcome variables were tested for multicollinearity by first checking that the correlations were not too high (> .7), that tolerance was not too low (< .1) and VIF was not too high (> 10). The tests showed correlations between -.3 and .23, of which some were statistically significant, indicating associations between variables, but not too high correlations. Tolerance was between .86 and .99, i.e. not too low, and VIF was between 1.16 and 1.0, i.e. not too high.

Outliers and normality were checked through scatterplot graphs for each of the behaviors and the data was deemed to be within the bounds of normality. Linearity was checked through the normal p-p plot of regression standardized residual graphs for each of the behaviors and the data was deemed to be within the bounds of linearity.

APPENDIX 3

Syntax for hierarchical regressions:

```
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING PAIRWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE ZPP
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT rdcenr
  /METHOD=ENTER newgndr
  /METHOD=ENTER agea eduyrs newdomic
  /METHOD=ENTER Self_tr Self_en
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS NORMPROB(ZRESID)
  /SAVE MAHAL COOK.

REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING PAIRWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE ZPP
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT eneffap
  /METHOD=ENTER newgndr
  /METHOD=ENTER agea eduyrs newdomic
  /METHOD=ENTER Self_tr Self_en
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS NORMPROB(ZRESID)
  /SAVE MAHAL COOK.

REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING PAIRWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE ZPP
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Self_tr
  /METHOD=ENTER newgndr
  /METHOD=ENTER agea eduyrs newdomic
  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS NORMPROB(ZRESID)
  /SAVE MAHAL COOK.

REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING PAIRWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE ZPP
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Self_en
  /METHOD=ENTER newgndr
  /METHOD=ENTER agea eduyrs newdomic
```

```
/SCATTERPLOT=(*ZRESID ,*ZPRED)
/RESIDUALS NORMPROB(ZRESID)
/SAVE MAHAL COOK.
```