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Audra Balundé

The Power of Environmental Considerations to Guide Pro-Environmental Behavior

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# The Power of Environmental Considerations to Guide Pro-Environmental Behavior Among Different People and in Different Contexts

DOCTORAL DISSERTATION
SOCIAL SCIENCES, PSYCHOLOGY (S 006)

Audra Balundé

# The Power of Environmental Considerations to Guide Pro-Environmental Behavior Among Different People and in Different Contexts

Audra Balundė

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# The Power of Environmental Considerations to Guide Pro-Environmental Behavior Among Different People and in Different Contexts

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by

**Audra Balundė**
born on 16 October 1983
in Vilnius, Lithuania

**Supervisors**
Prof. R. Žukauskienė
Prof. G. Perlaviciute
Prof. E.M. Steg

**Assessment Committee**
Prof. N. Hansen
Prof. E. van der Werff
Prof. D. Serapinas
Prof. S. Clayton

MYKOLAS ROMERIS UNIVERSITY

**Audra Balundė**

# THE POWER OF ENVIRONMENTAL CONSIDERATIONS TO GUIDE PRO-ENVIRONMENTAL BEHAVIOR AMONG DIFFERENT PEOPLE AND IN DIFFERENT CONTEXTS

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Vilnius, 2023

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**Scientific supervisors:**
Prof. dr. Rita Žukauskienė (2015-2023, Mykolas Romeris University, Lithuania, Social Sciences, Psychology, S 006).
Prof. dr. Goda Perlavičiūtė (2016-2023, University of Groningen, the Netherlands, Social Sciences, Psychology, S 006).
Prof. dr. Linda Steg (2016-2023, University of Groningen, the Netherlands, Social Sciences, Psychology, S 006).

The doctoral dissertation will be defended in the Psychology Science Council of Mykolas Romeris University and Vytautas Magnus University:

**Chairperson:**
Prof. dr. Aistė Diržytė (Mykolas Romeris University, Lithuania, Social Sciences, Psychology, S 006).

**Members:**
Asst. prof. dr. Andrik Becht (Utrecht University, Social Sciences, Psychology, S 006).
Prof. dr. Silvia Collado (University of Zaragoza, Social Sciences, Psychology, S 006).
Prof. dr. Danielius Serapinas (Mykolas Romeris University, Lithuania, Medicine and Health Sciences, Medicine, M 001).
Prof. dr. Audronė Telešienė (Kaunas University of Technology, Social Sciences, Sociology, S 005)

The doctoral dissertation will be defended in the public remote meeting of the Psychology Science Council on the 14th of September 2023, at 13:45 pm. at Mykolas Romeris University. Address: Ateities str. 20, LT- 08303, Vilnius, Lithuania.

MYKOLO ROMERIO UNIVERSITETAS

**Audra Balundė**

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**Mokslinės vadovės:**
Prof. dr. Rita Žukauskienė (2015-2023, Mykolo Romerio universitetas, Lietuva, socialiniai mokslai, psichologija, S 006).
Prof. dr. Goda Perlavičiūtė (2016-2023, Groningeno universitetas, Nyderlandai, socialiniai mokslai, psichologija, S 006).
Prof. dr. Linda Steg (2016-2023, Groningeno universitetas, Nyderlandai, socialiniai mokslai, psichologija, S 006).

Daktaro disertacija ginama, Mykolo Romerio universiteto ir Vytauto Didžiojo universiteto psichologijos mokslo krypties tarybose:

**Pirmininkė:**
Prof. dr. Aistė Diržytė (Mykolo Romerio universitetas, Lietuva, socialiniai mokslai, psichologija, S 006).

**Nariai:**
Asst. prof. dr. Andrik Becht (Utrechto universitetas, socialiniai mokslai, psichologija, S 006).
Prof. dr. Silvia Collado (Saragosos universitetas, socialiniai mokslai, psichologija, S 006).
Prof. dr. Danielius Serapinas (Mykolo Romerio universitetas, Lietuva, medicinos ir sveikatos mokslai, medicina, M 001).
Prof. dr. Audronė Telešienė (Kauno technologijos universitetas, socialiniai mokslai, sociologija, S 005)

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The Power of Environmental Considerations to Guide Pro-Environmental Behavior Among Different People and in Different Contexts

A. Balundė

## Propositions

1. Environmental self-identity (i.e., the extent to which one sees oneself as a person who acts environmentally friendly) is a theoretically and empirically distinct construct from other constructs representing people-environment relationship such as environmental identity and connectedness with nature (i.e., feeling connected to the natural environment or parts of it). (this thesis)
2. Biospheric values and environmental self-identity can motivate a range of different pro-environmental behaviors in Lithuania. (this thesis)
3. Biospheric values and environmental self-identity can motivate a range of different pro-environmental behaviors not only among adults but also among adolescents. (this thesis)
4. General environmental considerations, in particular biospheric values and environmental self-identity, explain adolescents' pro-environmental behavior to a similar extent as behavior-specific factors, such as habits and social norms. (this thesis)
5. Environmental considerations of Lithuanian parents and their adolescent children are strongly related. (this thesis)
6. Some behaviors were not related to environmental considerations, both among adults (e.g., fuel-efficient driving) and adolescents (e.g., purchasing unpackaged goods). When behaviors are too costly, interventions such as strengthening environmental considerations and changing the context might be needed to reduce behavioral costs and to enable people to act upon their environmental considerations. (this thesis)
7. No individual success can be accomplished without the collective effort and support of many.
8. Things are often not the way they initially appear.

# Content

## LIST OF CONFERENCE PRESENTATIONS

1. Balundė, A., & Perlaviciute, G. (2021, April). *The relationship between adolescents' and their parents' environmental values, self-identity and personal norms: representative household study* [Conference presentation]. International Congress of Psychology in Lithuania. Online event.
2. Balundė, A. (2019, October). *Exploring the role of moral and identity factors in explaining youngsters' environmentally-friendly actions* [Conference presentation]. Conference Social Innovations: Inclusiveness and Civic Mindedness. Vilnius, Lithuania.
3. Balundė, A., Jovarauskaitė, L., & Poškus, M. S. (2019, November). *Exploring Adolescents' Environmental Citizenship-Relevant Behaviors via General and Behavior-Specific Approaches* [Conference presentation]. 1st International Conference of International Researchers of the Education for Environmental Citizenship. Malaga, Spain.
4. Balundė, A., Perlavičiūtė, G., & Truskauskaitė-Kunevičienė, I. (2019, September). *Testing the effect of environmental considerations in explaining adolescents' environmental behavior* [Conference presentation]. Biennial International Conference of Environmental Psychology. Plymouth, UK.
5. Balundė, A. (2018, July). Explaining adolescents' pro-environmental actions by employing values-identity-personal norms model [Conference presentation]. 25th Biennial Meeting of the International Society for the Study of Behavioral Development. Gold Coast, Queensland, Australia.
6. Jovarauskaitė, L., & Balundė, A. (2017, September). *The relationship between connectedness to nature and environmental identity: Results of a systematic review* [Conference presentation]. International Conference on Environmental Psychology. A Coruna, Spain.
7. Balundė, A., Perlaviciute, G., & Steg, L. (2017, September). *The relationship between values, environmental self-identity, and pro-environmental behaviour in Lithuania* [Conference presentation]. International Conference on Environmental Psychology. A Coruna, Spain.

## LIST OF STUDIES

1. Balundė, A., Jovarauskaitė, L., & Poškus, M. S. (2019). Exploring the Relationship Between Connectedness with Nature, Environmental Identity, and Environmental Self-Identity: A Systematic Review and Meta-Analysis. *SAGE Open*. https://doi.org/10.1177/2158244019841925
2. Balundė, A., Perlaviciute, G., & Steg, L. (2019). The relationship between people's environmental considerations and pro-environmental behavior in Lithuania. *Frontiers in Psychology*, *10*, 2319. https://doi.org/10.3389/fpsyg.2019.02319
3. Balundė, A., Perlaviciute, G., & Truskauskaitė-Kunevičienė, I. (2020). Sustainability in youth: Environmental considerations in adolescence and their relationship to pro-environmental behavior. *Frontiers in Psychology, 11*, 582920. https://doi.org/10.3389/fpsyg.2020.582920
4. Balundė, A., Jovarauskaitė, L., & Poškus, M. S. (2020). Exploring adolescents' waste prevention via value-identity-personal norm and comprehensive action determination models. *Journal of Environmental Psychology, 72*, 101526. https://doi.org/10.1016/j.jenvp.2020.101526
5. Balundė, A., & Perlavičiūtė, G. Are We on The Same Page? Exploring the Relationships Between Environmental Values, Self-Identity, Personal Norms and Behavior in Parent-Adolescent Dyads is under the consideration in Journal of Environmental Psychology and is currently under the second round of revisions.

# CHAPTER 1

## The Power of Environmental Considerations to Guide Pro-Environmental Behavior Among Different People and in Different Contexts

## 1.1 Introduction

If people acted more pro-environmentally, it would help mitigate the climate crisis that our society is facing (IPCC, 2022). Pro-environmental behavior refers to actions aimed at avoiding harm to the environment and safeguarding it (Steg & Vlek, 2009). The climate crisis refers to the situation in which urgent actions are needed to address ecological challenges and stop damage to the environment caused by the climate change (Oxford University Press, n.d.; Ripple et al., 2020). The scope and the seriousness of ecological challenges urge us to identify general factors that could facilitate various pro-environmental behaviors among different people in different contexts. Identifying these general factors could inform interventions aimed at promoting pro-environmental behavior on a large scale – by addressing the key antecedents of a wide range of pro-environmental behaviors.

Research has shown that people's environmental considerations, in particular biospheric values and environmental self-identity, are important general factors that can foster multiple pro-environmental behaviors crucial to address the climate crisis (van der Werff et al., 2013a; van der Werff & Steg, 2016). Biospheric values reflect the extent to which people generally have the goal in their life to care about and protect nature and the environment (Steg & de Groot, 2012). Biospheric values have been found to explain multiple pro-environmental behaviors, including willingness to reduce car use, recycling and energy-efficient driving (Nordlund & Garvill, 2003; van der Werff et al., 2013b, 2014b). Biospheric values can intrinsically motivate people to protect the environment (Steg, 2016), which means that people act pro-environmentally because of the inner personal reasons, such as experiencing a sense of meaningfulness, feeling that one is doing the right thing and feeling positive emotions when conserving the environment, rather than for extrinsic incentives, such as finacnial rewards (Bolderdijk et al., 2013; Venhoeven et al., 2020). Intrinsic motivation is particularly important for pro-environmental behaviors because such behaviors are often not very pleasurable in a sense of convenience and comfort (e.g., taking public transportation or riding a bike might be less convenient than taking a car) and sometimes may be costlier (e.g., organic food products might be more expensive than regular options). If people are intrinsically motivated, they may consistently engage in pro-environmental

behaviors even when there are no attractive external incentives to do so (Bolderdijk et al., 2013; de Groot & Steg, 2010; Lindenberg & Steg, 2007). Notably, feeling that one is doing the right thing in general (Deci & Ryan, 2008) and for the environment protection in particular have been found to elicit positive feelings (Taufik et al., 2015) and to promote people's well-being (Venhoeven et al., 2016, 2020). This type of well-being refers to eudaimonic well-being that is caused by a sense of meaningfulness that can motivate behavior even if that behavior does not bring immediate gratification (Ryan et al., 2008)[1].

Biospheric values are mostly indirectly related to pro-environmental behaviors via intermediate factors, such as environmental self-identity (van der Werff et al., 2014b). Environmental self-identity reflects the extent to which one sees oneself as a person who acts environmentally friendly (van der Werff et al., 2013b). Stronger environmental self-identity leads to multiple pro-environmental behaviors, such as recycling and use of environmentally-friendly transportation for daily commuting (van der Werff et al., 2013b; Whitmarsh & O'Neill, 2010). Importantly, environmental self-identity is rooted not only in biospheric values, but also in people's past pro-environmental behavior, which makes environmental self-identity a valuable target for interventions aimed at promoting pro-environmental behavior. Specifically, while biospheric values are relatively stable constructs, environmental self-identity can be targeted and strengthened via interventions, for example by reminding people about their past pro-environmental behavior (i.e., fuel-efficient driving style), which in turn strengthens people's motivation to engage in (other) pro-environmental behaviors (i.e., reduce meat consumption) (van der Werff et al., 2013a, 2014a, 2014b).

Biospheric values and environmental self-identity are key general factors that can guide many different pro-environmental behaviors. Being such general factors, they can influence concrete pro-environmental behaviors via factors specific to those behaviors, such as personal norms to engage in a specific behavior (van der Werff et al., 2013a, 2013b, 2019). Personal norms are internalized moral standards expressed as a sense of moral obligation

1 The relationship between pro-environmental behavior and eudaimonic well-being is extensively studied in Leonore Amelie Venhoeven's thesis (Venhoeven, 2016).

to engage in various pro-environmental behaviors (Schwartz, 1977; Steg et al., 2011), such as the personal norm to reduce car use, choose sustainable clothing, and to use green energy (Barbarossa & De Pelsmacker, 2016; Nordlund & Garvill, 2003; van der Werff et al., 2013a). As such, personal norms connect people's biospheric values and environmental self-identity to specific pro-environmental behaviors. Once people's personal norm to engage in a specific behavior is activated, for example by providing concrete information about how much other people engage in such behavior (de Groot et al., 2021), the behavior can further be encouraged by enabling people to act upon their personal norms, for example by removing contextual barriers that could inhibit the specific behavior (see van der Werff et al., 2019).

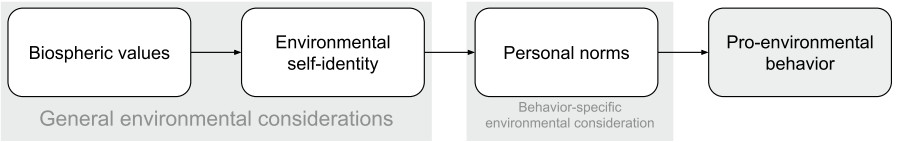
The whole chain of relationships from biospheric values to pro-environmental behavior mediated by environmental self-identity and personal norms has been demonstrated for various behaviors, including behaviors at home, on holidays and at work (Figure 1; Ruepert et al., 2016; van der Werff & Steg, 2016; Xu et al., 2019). At the same time, however, the model has only been tested in WEIRD countries (Western, Educated, Industrialized, Rich and Democratic; Henrich, Heine, & Norenzayan, 2010) and exclusively among adult populations. We therefore do not know how generalizable the model is in other less explored countries and beyond adult samples. If we are to use environmental considerations to promote pro-environmental behaviors at a large scale, there is a need to study the relationship between environmental considerations and pro-environmental behavior in less explored contexts and among different people that have been overlooked in previous studies. For example, people in non-WEIRD countries need to be included because of the global scale of climate change, and adolescents need to be included because they are the future generation that will be much affected by climate change and whose actions will be critical for mitigating climate change. To address this gap, in this dissertation we will explore to what extent general environmental considerations, namely biospheric values and environmental self-identity, and specific environmental considerations, namely personal norms to engage in pro-environmental behavior, can explain various pro-environmental behavior in Lithuania and for adolescents.

Given that environmental self-identity bridges the gap between biospheric values and specific pro-environmental behaviors (van der Werff et al., 2013b),

first, we clarify to what extent environmental self-identity is distinct from other constructs representing human-environment relationship, that may potentially play a role in biospheric values and pro-environmental behavior relationship. Second, we study the relationship between environmental considerations and pro-environmental behavior in a non-WEIRD country, namely Lithuania. Third, we study this relationship for adolescents in Lithuania. We also compare how well environmental considerations predict pro-environmental behavior in comparison to behavior-specific factors among adolescents. Fourth, we look at how environmental considerations could possibly form, namely by testing the relationship between parent-adolescent biospheric values, environmental self-identity and personal norms. In all these steps, we look to what extent environmental considerations explain multiple pro-environmental behaviors. Past studies that explored predictors of pro-environmental behavior in Lithuania either focused on behavior-specific factors (Jovarauskaitė, 2020; Poškus, 2019) or looked at the extent to which behavior-specific factors explain one specific behavior (Jovarauskaitė, 2020). This dissertation expands these studies and explores to what extent general environmental considerations can explain many pro-environmental behaviors.

Knowledge about which factors motivate individuals to engage in multiple pro-environmental behaviors are particularly relevant for stakeholders such as policy makers, environmental activists, educators, communities, NGOs and everyone, who works in addressing issues related to climate crisis. Identifying factors that universally motivate pro-environmental behavior among different people in different contexts can help address the climate crisis at scale. To address this need, the thesis will deliver important insights for practice. We will share insights into the extent to which environmental considerations can explain multiple pro-environmental behavior in Lithuania among adults and adolescents; how well environmental considerations explain pro-environmental behavior compared to other behavior-specific factors; and to what extent family context is important for environmental considerations to form.

**Figure 1** The Relationship Between Environmental Considerations and Pro-Environmental Behavior




*Note*. Figure adapted from van der Werff and Steg (2016).

### 1.1.1 Distinguishing Environmental Self-Identity from Other Constructs Describing Human-Environment Relationship

Being rooted in biospheric values, environmental self-identity reflects people's intrinsic motivation to engage in multiple pro-environmental behaviors (van der Werff et al., 2013b). Besides biospheric values, environmental self-identity is also influenced by people's past behavior (van der Werff et al., 2014a). This makes environmental self-identity a more malleable construct for interventions compared to biospheric values, which are relatively stable and difficult to change (Milfont et al., 2016; Schwartz, 2012b). For example, reminding people of their past pro-environmental behaviors (i.e., fuel-efficient driving) led to stronger environmental self-identity, which in turn resulted in stronger intentions to act pro-environmentally (e.g., to reduce meat consumption; van der Werff et al., 2014b). Importantly, strengthening environmental self-identity by reminding people of their specific past pro-environmental actions may explain positive "spill over" effect to various other pro-environmental actions. Environmental self-identity is therefore a crucial factor explaining pro-environmental behavior that offers possibilities for interventions aimed at fostering pro-environmental behavior (van der Werff et al., 2014a).

Other constructs have been introduced in the literature that, similar to environmental self-identity, describe how people perceive themselves in

relation to the environment[2], in particular connectedness with nature, which refers to perceiving oneself as being a part of nature (Schultz, 2002), and environmental identity, which reflects one's feeling of being connected to certain parts of the natural environment (Clayton, 2003). Seeing oneself as part of or connected to the natural environment could also be associated with pro-environmental behavior, as people may want to protect this part of their identity (Bruni et al., 2021; Martin & Czellar, 2017; Nisbet et al., 2009). However, we argue that environmental self-identity is distinct from these constructs and is most relevant for understanding and influencing people's different pro-environmental behaviors. This is because there could lie different types of motivations to act pro-environmentally behind one's sense of connection with the natural environment (i.e., connectedness with nature, environmental identity) and seeing oneself as someone who acts pro-environmentally (i.e., environmental self-identity). Specifically, feeling connected to the natural environment or parts of it might not necessarily lead to consistent engagement in many pro-environmental behaviors, because people might only engage in behaviors that are exclusively related to protecting the natural environment, but not other pro-environmental behaviors that not merely protect the environment, such as saving energy (e.g., meat consumption, shower time and driving style; van der Werff et al., 2013b). Whereas if people are motivated by their environmental self-identity, they may engage in different types of pro-environmental behaviors that may not be directly related to preserving their natural environment. Therefore, in the scope of this PhD thesis, it is important to explicate how environmental self-identity is a unique concept for understanding and influencing people's pro-environmental behavior next to other constructs explaining human-environment relationship. To achieve this, we will explore its conceptual and empirical distinction from other constructs

2 Usually another umbrella term - human-nature relationship - is used in the literature to refer to various constructs that describe the relationships between people and the environment. We also used it in Chapter 2, to align with the literature. For the rest of this thesis, however, we propose that the term human-environment relationship is more accurate because it not only refers to the extent to which people feel related to nature, but also to the environment in general. People might seek to conserve not only natural environment, but also improve the quality of the environment around them. For example, to reduce CO2 emissions by shifting to clean energy.

that describe human-environment relations, namely connectedness with nature and environmental identity. The idea that environmental self-identity is a conceptually distinct theoretical construct from other theoretical concepts representing human-environment relations was raised in the literature before (Olivos & Clayton, 2017; van der Werff et al., 2013b). Yet there have not been attempts to explore this distinction in a systematic way, including an analysis of both theoretical and empirical relationships between these constructs, which we did in this thesis. Specifically, in Chapter 2, we conduct a systematic literature review on constructs representing human-environment relationships to identify their conceptual commonalities and, more importantly, their differences. Also, we evaluate the strength of relationship between different constructs representing human-environment relationship, to gain insights about their empirical distinctions.

#### *1.1.1.1 Overview of Method and Results of Chapter 2*

We examined the conceptual and empirical similarities and differences between environmental self-identity, connectedness with nature and environmental identity. Evaluating the size of the correlation coefficients is one way to test the extent to which constructs are similar or distinct. The higher the coefficient the higher is the likelihood that constructs are similar and the other way around. Besides, we review theoretical arguments on why certain human-environment constructs are distinct from each other or similar. Thus, we looked at how strongly constructs are related with each other and whether this relationship is in line with the theory (Campbell & Fiske, 1959). We first conducted a systematic review and analysis of the literature on these three constructs, identifying how they are conceptually similar and, most importantly, what are the key conceptual differences between these constructs. Next, we carried out a meta-analysis to investigate the relationship between these three constructs, to assess their empirical overlap and distinctiveness. From the results of the theoretical analysis ($k = 14$), we concluded that connectedness with nature, environmental identity and environmental self-identity define people's self-concept in relation to the environment. The key difference is that for connectedness with nature and environmental identity, the core of the self-concept is feeling part of the natural environment, whereas for environmental self-identity, the core of the self-concept is acting pro-environmentally. In theory, strong environmental

self-identity can lead to pro-environmental behavior irrespective of how much people consider themselves as part of the natural environment, which makes environmental self-identity a valuable target for behavioral interventions. The results from the meta-analysis ($N = 8513$) revealed a strong correlation between the measures of connectedness with nature and environmental identity ($r = .75$ [0.67, 0.83], $k = 11$, $n = 4087$), whereas the relationship between the measures of connectedness with nature and environmental self-identity was less strong ($r = .57$ [.31, .84], $k = 5$, $n = 4426$)[3]. The results show that, despite the positive and statistically significant relationships, there is also a certain degree of empirical distinction between environmental self-identity and connectedness with nature, in line with their theoretical distinction. The significant positive relationship between connectedness with nature and environmental self-identity is not surprising given that both constructs define people's self-concept in relation to the environment.

### 1.1.2 Relationships Between Environmental Considerations and Pro-Environmental Behavior in Lithuania

The research on the relationship between environmental considerations and pro-environmental behavior so far has mostly been conducted in WEIRD countries. Initial evidence from non-WEIRD countries suggests that environmental considerations can explain pro-environmental behavior in these countries too. For example, biospheric values were related to various personal norms to engage in pro-environmental behavior in Hungary (e.g., personal norm to reduce car use; de Groot et al., 2012). Furthermore, biospheric values predicted, via personal norms, efficient energy use and intentions to reduce car use in Argentina (Jakovcevic & Reyna, 2017; Jakovcevic & Steg, 2013), energy conservation behavior in Turkey (Sahin, 2013), and acceptability of car use reduction policies in Russia (Ünal et al., 2019). None of these studies, however, tested to what extent both general environmental considerations, namely biospheric values and environmental self-identity, are related to pro-environmental behavior; environmental self-identity was not examined

3 Systematic literature review yielded no data that would allow to measure the relationship between environmental identity and environmental self-identity.

in these studies. Yet, environmental self-identity can be a critical factor for interventions aimed at promoting pro-environmental behavior (see section 1.1). One exception is a study that found that the stronger their biospheric values, the more people perceived themselves as someone who purchases energy efficient appliances, which in turn was associated with purchasing energy efficient appliances in Vietnam (Nguyen et al., 2016). Yet, since environmental self-identity was measured at a very specific level (i.e., "Buying energy efficient appliances makes me feel that I am an environmentally friendly consumer"), we do not know to what extent it would predict other pro-environmental behaviors. In fact, all the above studies focused on a single or a few specific pro-environmental behaviors, rather than a range of different behaviors. Thus, the question remains to what extent general environmental considerations, namely biospheric values and environmental self-identity, are universal factors that can explain multiple pro-environmental behaviors in different countries. This dissertation will fill these gaps. First, in Chapter 3, we study the extent to which biospheric values and environmental self-identity can explain different pro-environmental behaviors in Lithuania, among adults.

The term WEIRD countries was coined to emphasize that studies in various disciplines including social sciences mostly rely on samples from western, educated, industrialized, rich and democratic countries, mostly from Western Europe and the United States (Ghai, 2021; Henrich et al., 2010), and overlook other samples from less affluent countries. Additionally, in the environmental context in particular, WEIRD countries typically already have a relatively long tradition of policies aimed at promoting pro-environmental behavior, whereas such policies only start to be considered in non-WEIRD countries, emphasizing the need to better understand factors that drive pro-environmental behaviors in such countries. Studies in WEIRD countries suggest that biospheric values and environmental self-identity explain various pro-environmental behaviors (e.g., energy saving, environmental activism; Ruepert et al., 2016; van der Werff & Steg, 2016). Yet, one could argue that environmental considerations only explain pro-environmental behaviors in countries where people do not face other huge challenges, such as social (e.g., high rates of poverty), demographic (e.g., drain of intellectual capital) and economic (e.g., unemployment) challenges. People preoccupied with these issues might act on other considerations, rather than environmental ones. For example, people's behavior might

be guided by economic concerns rather than their environmental considerations. Consequently, when considering whether to recycle their household waste, people may focus on the financial consequences (e.g., is it cheaper to recycle than not) rather than consequences for the environment. As a result, environmental considerations may be related weakly or not related to people's pro-environmental behavior. Noteworthy, WEIRD countries represent 12% of the world's entire population, suggesting that the findings from such countries enable understanding only of a small fraction of countries (Henrich et al., 2010). The results from such countries might not necessarily accurately inform policies in other countries and contexts. Yet, climate crisis requires joint actions across the world, for which we need to better understand key factors that guide pro-environmental behavior in different countries, especially in regions that have been neglected in research so far.

In this PhD thesis, we study the relationship between environmental considerations and behavior in Lithuania – a country in the Baltic region that was under the Soviet occupation for decades. During the occupation period and years after, people in Lithuania experienced constant shortages of variety of resources, from food to clothing and household items, which might have led people to prioritize economic more than other concerns, such as environmental protection. Currently, Lithuania is considered to be an economically developed country by OECD (Demmou, 2016) with highly educated citizens (OECD, 2022). Thus, one might argue that Lithuania is yet another WEIRD country. However, OECD experts point out that Lithuania faces a unique mixture of social, demographic and economic issues, that are not typical for WEIRD countries (Demmou, 2016). These issues include one of the highest suicide rates in the world (WHO, 2021), people living at risk of poverty and social exclusion[4] (country-level - 25%, in rural areas - 32%), one of the lowest incomes among EU countries, huge welfare gaps between urban and rural areas, high rates of unemployment in rural areas (country-level unemployment - 15%, in rural areas

4 Being at risk of poverty and social exclusion refers to a sum of indicators such as risk of poverty, severe material and social deprivation and living in a household with a very low work intensity. Examples of these indicators include low monthly income, inability to buy certain material items or engaging in social activities and working less than 20% of potential work-time per year (Eurostat, 2021).

- 23%), high emigration rates and drain of the intellectual capital[5] (Eurostat, 2022b, 2022a; Okunevičiūtė-Neverauskienė & Pocius, 2019; OSP, 2020a, 2022; Pociūtė-Sereikienė, 2019; Ubarevičienė & van Ham, 2017; UT, 2021). The need to deal with these issues might make people prioritize other concerns than environmental concerns when engaging in various behaviors, resulting in a weaker relationship between environmental considerations and environmental behavior among people in Lithuania. When asked about which issues concern them most, 68% of Lithuanian citizens indicated economic issues (e.g., rising prices, inflation and living costs), while only 1% indicated environmental issues (e.g., climate change and energy-related issues) (Eurobarometer, 2018). Studies furthermore indeed show strong materialist values among Lithuanians (Inglehart, 2018). Focus on materialist values could potentially inhibit the relationship between environmental considerations and pro-environmental behavior in Lithuania (Hurst et al., 2013; Wang et al., 2019).

It is highly relevant to study factors that influence pro-environmental behavior in Lithuania, as the country is facing serious environmental issues that are growing in scope, including air pollution, water contamination with industrial waste, deforestation and biodiversity decline (EEA, 2020; EPHA, 2018; GFW, 2022). Environmental policies in Lithuania are only starting to be implemented to address these issues. Policy measures so far have focused on making pro-environmental behavior more feasible and beneficial and making the environmentally harmful behavior costlier. Examples include developing infrastructure for recycling, improving cycling paths, implementing financial incentives, such as deposit system for recycled bottles and cans, and taxing polluting technologies (European Environment Agency, 2015; Packaging and Packaging Waste Processing Law, 2001). Developing the infrastructure and regulations to enable pro-environmental behavior is a necessary first step. However, interventions could potentially be more effective if considering people's motives to use this infrastructure and the regulations in place. Specifically, focusing exclusively

5 Lithuania's population decreased from 3.7 million in 1989 to 2.9 million in 2015; the largest decline among the world's countries (Ubarevičienė & van Ham, 2017; United Nations - DESA, 2015). The population decline is especially prominent in regions outside big cities, which mostly are left by younger residents with higher education (OSP, 2020b; Ubarevičienė & van Ham, 2017).

on financial costs and benefits of specific pro-environmental behavior might draw people's attention to practical concerns rather than environmental issues. This could reduce the effectiveness of the intervention and lower chances that people will act upon their environmental considerations (Bolderdijk et al., 2013). Namely, there is a risk that people will stop acting pro-environmentally as soon as the incentives are taken away. Whereas if people act upon their environmental considerations, they may act pro-environmentally even if there are no immediate benefits and they may do so across different types of behaviors. However, to know whether it is effective to target environmental considerations in Lithuania, it is first important to find out to what extent environmental considerations and pro-environmental behavior are related.

#### *1.1.2.1 Overview of Method and Results of Chapter 3*

In Chapter 3, we performed a cross-sectional study with a convenience adults' sample in Lithuania (334, 79.6% females, $M_{age}$ = 34.28, $SD_{age}$ = 12.28). The sample is likely to be comparable to the general population. Specifically, the sample was representative in terms of the expression of biospheric values. European Social Survey (ESS-ERIC, 2020), which uses national representative data and was conducted few months after the current study found that biospheric values of people in Lithuania are expressed to a similar extent as we found in this study; 55.9% and 61.8% of respondents respectively[6]. We used established instruments to measure people's environmental considerations and pro-environmental behavior. Biospheric values were measured with the short version of the Schwartz's values scale (Schwartz, 1992, 1994) developed by de Groot and Steg (2007); environmental self-identity was measured with the scale developed by van der Werff and colleagues (van der Werff et al., 2013a, 2013b); and

6 The European Social Survey used a one-item instrument to measure biospheric values, finding that 55.9% of participants agreed with the statement "It is important to care for nature and environment." We calculated this percentage only from the responses indicating strong agreement (i.e., "Very much like me" and "Like me") that it is important to care for nature. In our study, we measured biospheric values using four items (e.g., "Protecting the environment and preserving nature"). Similarly, we calculated the percentage of agreement with the importance of caring for nature only from responses indicating strong agreement (i.e., "Supreme importance" and "Very important"). We then averaged the percentage across the four items.

different types of pro-environmental behaviors were measured with the items adopted from the General Ecological Behavior instrument (Kaiser & Wilson, 2004). Structural equation modeling (SEM) was used to test the relationships between biospheric values, environmental self-identity and pro-environmental behavior. The findings revealed that people's environmental considerations were positively related with recycling and environmental activism, but not with fuel-efficient driving and the use of sustainable transportation in Lithuania. We conclude that also in Lithuania general environmental considerations can guide pro-environmental behaviors, yet for some behaviors there may be important contextual barriers that may prevent people from acting upon their environmental considerations.

### 1.1.3 Relationships Between Environmental Considerations and Pro-Environmental Behavior in Adolescence

General environmental considerations, namely biospheric values and environmental self-identity can explain environmental behavior of adults (e.g., Ruepert et al., 2016; van der Werff & Steg, 2016). Yet, we do not know to what extent these effects are generalizable to other age groups. Adolescents in particular are an important group to study because they are the generation that will be heavily affected by climate change and whose actions are important for further preventing the negative consequences of climate change. Adolescents also go through developmental peculiarities unique to this specific age group. Namely, adolescents' values, identities and norms are still forming (Klimstra et al., 2010; Meeus et al., 2010; Vecchione et al., 2019), suggesting that their environmental considerations could be still in development too. Furthermore, research suggests that particularly in adolescence environmental considerations may be weaker than at other life stages, potentially surpassed by other considerations dominant at this age. For example, values related to caring for nature and other people (i.e., universalism values) are less prioritized in adolescence than later in life (Schwartz, 2012; Vecchione et al., 2019), and they are weaker than self-enhancement values (e.g., caring about achievement and power; Schwartz, 2012; Vecchione et al., 2019). Environmental self-identity might be changing too, since adolescents' self-identities are not stable and constantly changing as they are exploring and testing their identities (e.g., Crocetti et al., 2008). Personal norms are also still developing in adolescence (Hart & Carlo, 2005; Malti et al.,

2021), and research suggests that adolescents see pro-environmental behavior as less obligatory than younger children (Krettenauer, 2017). Furthermore, adolescents tend to engage less in pro-environmental behavior compared to children and adults (Evans et al., 2007; Krettenauer et al., 2019; Otto et al., 2019; Otto & Kaiser, 2014; Wray-Lake et al., 2017). So far, the relationship between adolescents' biospheric values, environmental self-identity, personal norms to engage in pro-environmental behavior and pro-environmental behavior has not been studied. There is initial evidence that adolescents' pro-environmental behavior and personal norms to engage in pro-environmental behavior are related (Collado, Staats, et al., 2017; Matthies et al., 2012), yet it has not been studied whether adolescents' personal norms are rooted in biospheric values and environmental self-identity. Adolescents' personal norms to engage in pro-environmental behavior could be rooted in other than environmental considerations. For example, one could feel obliged to separate waste because their parents tell them to do so or because their peers approve of such behavior. Therefore, we will study to what extent adolescents' personal norms to engage in pro-environmental behavior are rooted particularly in biospheric values and environmental self-identity.

Given that adolescents' environmental considerations may still be forming, the question is to what extent they can motivate multiple pro-environmental behaviors of adolescents. In this study, we study to what extent – if at all – adolescents' pro-environmental behaviors are rooted in biospheric values, environmental self-identity and personal norms to engage in pro-environmental behavior; thereby generating further insights into the extent to which environmental considerations are universal factors that can explain multiple pro-environmental behaviors in different contexts among different people.

#### *1.1.3.1 Overview of Method and Results of Chapter 4*

To test whether environmental considerations can explain pro-environmental behavior of adolescents, in Chapter 4 we have conducted three cross-sectional studies with adolescents in Lithuania (Study 1: 256, 54.7% females, $M_{age}$ = 15.33, $SD_{age}$ = .91; Study 2: 349, 54.7% females, $M_{age}$ = 16.07, $SD_{age}$ = 0.99; Study 3: 905, 54.3% females, $M_{age}$ = 15.23, $SD_{age}$ = .68). We measured key variables with the same instruments as indicated in subsection 1.1.2.1. In addition, we studied how general environmental considerations (i.e., biospheric values

and environmental self-identity) relate to pro-environmental behavior via behavior-specific environmental considerations, namely personal norms to engage in pro-environmental behavior (van der Werff et al., 2013a, 2013b). SEM was used to test the relationships between biospheric values, environmental self-identity, personal norms and pro-environmental behavior of adolescents. We found that adolescents' biospheric values and environmental self-identity were associated, via personal norms, with a wide range of pro-environmental behaviors, including recycling, environmentally friendly traveling, purchasing environmentally friendly goods and drinking tap water. We conclude that general environmental considerations are related, via personal norms, to multiple pro-environmental behaviors of adolescents. This provides additional evidence that environmental considerations are important factors explaining pro-environmental behaviors in Lithuania and among adolescents.

### 1.1.4 The Role of Environmental Considerations in Explaining Adolescents' Pro-Environmental Behavior Compared to Other Factors

Biospheric values and environmental self-identity are general factors that can explain multiple pro-environmental behaviors, via personal norms to engage in specific pro-environmental behaviors. They are important because being general antecedents of behavior they could explain many pro-environmental behaviors. However, other factors that are less general and more related to specific behaviors could potentially be stronger predictors of specific pro-environmental behaviors. Specifically, the Comprehensive Action Determination Model (CADM) posits that behavior-specific factors, namely social norms, awareness about specific environmental issues (e.g., negative effects of using plastic bottles on the environment) and about the consequences of one's own specific behavior for the environment (e.g., drinking bottled water), habits, perceived behavioral control and acess to behavior can guide pro-environmental behavior (Klöckner & Blöbaum, 2010; Stern, 2000). Studies in adult samples show that such behavior-specific factors influence pro-environmental behavior, such as sustainable travel mode choice (i.e., public transportation instead of a car), recycling, environmentally friendly heating system choice, energy saving and recycling at work (Klöckner & Blöbaum, 2010; Klöckner & Friedrichsmeier, 2011; Klöckner & Oppedal, 2011; Ofstad et al., 2017; Sopha & Klöckner, 2011; van den

Broek et al., 2019). Such other factors could play an even more important role in environmental behavior of adolescents, due to developmental and contextual peculiarities at this age, as explained below.

Adolescents' pro-environmental behavior might be affected by perceived social norms via intentions, namely the extent to which one perceives social pressure to (not)engage in a specific pro-environmental behavior or the extent to which one perceives that engaging in a specific pro-environmental behavior is (un)acceptable in one's social environment (Fishbein & Ajzen, 2010). Individuals may internalize the moral standards of groups that are personally significant to them (e.g., peers), turning these standards into inner moral reference points – personal norms (Fishbein & Ajzen, 2010; Schwartz, 1977). Studies in adult samples showed that the more we feel people important to us expect us to use environmentally friendly means of transportation, the more we feel morally obliged to refrain from car use for the daily commutes, and the more we feel morally obliged to choose environmentally friendly transportation (Haustein et al., 2009). Social norms can be particularly relevant for adolescents. Adolescents are more sensitive than adults to social influences, especially to the pressure of their peers (Albert et al., 2013; Pinho et al., 2021). This suggests that social norms to act pro-environmentally might be an important factor influencing their personal norms to engage in pro-environmental behavior and eventually pro-environmental behavior. Yet no studies so far looked at how well general environmental considerations explain adolescents' personal norms to engage in pro-environmental behavior compared to behavior specific factors such as social norms.

Next, personal norms to engage in a specific pro-environmental behavior can be directly affected by one's awareness of need to protect the environment in a specific way (Klöckner & Blöbaum, 2010; Schwartz, 1977). Awareness of need reflects person's belief that the environment is in need for protection and that certain practices or behaviors, for example, using single-use shopping bags, contributes to environmental problems (Schwartz, 1977). Perception of the existing need to act could strengthen one's moral obligation to engage in a specific pro-environmental behavior. Similarly, awareness of consequences

of one's specific environmental behavior[7] is another factor that can affect personal norms to engage in a specific pro-environmental behavior (Klöckner & Blöbaum, 2010; Schwartz, 1968, 1977). Awareness of consequences is defined as the extent to which an individual thinks that their specific behavior has positive or negative effect on the environment (Klöckner & Blöbaum, 2010; Schwartz, 1968, 1977). For example, the level of people's awareness that by bringing their own shopping bag to the store they conserve the environment. The more one is aware that their behavior has impact on someone's or something's well-being, the more likely they may feel morally obliged to reduce their negative impact (Schwartz, 1968). For example, awareness of the negative impact of the personal car use on the environment was related to one's moral obligation to reduce car use and support for car use reduction policies (Klöckner & Blöbaum, 2010; Ünal et al., 2019)[8]. Environmental education partly determines the extent to which adolescents are aware of the need to protect the environment and the effects of their behavior on the environment. In some countries, including Lithuania, there is (yet) no systematic education[9] about environmental issues.

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7 Awareness of consequences in some research is referred to as problem awareness (e.g., Nordlund & Garvill, 2003; van der Werff & Steg, 2015). We use the term pointed out by Schwartz (1968).

8 The key difference between awareness of need and awareness of consequences is that the former construct indicates the extent to which one recognizes the need to alleviate a condition (e.g., reducing plastic use to address plastic pollution), while the latter construct indicates the extent to which one comprehends the repercussions of certain behaviors or practices on the environment (e.g., plastic use contributes to environment pollution) (Schwartz, 1968, 1977).

9 Environmental education considered as a systematic when it meets the following criteria: facilitates the development of awareness and sensitivity towards environmental issues; provides knowledge about causes of these issues and how they are related to other social issues; enables people to form set of attitudes, values and concern that prioritize environment protection; provides relevant skills to identify and address environmental issues; and empowers people to act towards addressing environmental issues (Benedict, 1999; Hungerford et al., 1980; UNESCO -Tbilisi Declaration, 1977). Analysis of policy documents and legislation suggests environmental education in Lithuania is only gaining attention from policy makers and is mostly focused on raising awareness of and providing knowledge about environmental issues (see for a review Balundė et al., 2021, p. 10). Yet to the best of our knowledge there are no attempts to make connection between knowledge translation into pro-environmental behavior in all levels of education, from pre-school to tertiary education institutions. Efforts to address other components of environmental educations is rather fragmented; these other components of environmental education are not included into the general curriculum (Kavaliauskaitė & Leščinskaitė, 2019; Poškus et al., 2019).

Consequently, adolescents may lack awareness about existing environmental issues and how their specific behaviors contribute to these issues, which can form an important barrier for their pro-environmental behavior. As such, (lack of) awareness of need and awareness of consequences could be important factors influencing adolescents' pro-environmental behavior, either directly or via perceived personal norms to engage in the behavior.

Accroding to CADM, personal norms to engage in pro-environmental behavior influence people's intentions to act pro-environmentally and in turn their environmental behaviour. In addition, CADM contains factors that could directly affect people's pro-environmental behaviour. First, perceived behavioral control – the belief that one has control over and capacity to perform specific behavior, which can directly affect personal norms to engage in pro-environmental behavior, intentions to act pro-environmentally and eventually pro-environmental behavior (Fishbein & Ajzen, 2010; Klöckner, 2013b; Klöckner & Blöbaum, 2010; Klöckner & Oppedal, 2011). Research among adults indeed suggests that the more person perceives that buying organic milk is under their control the more they feel morally obliged to do so (Klöckner & Ohms, 2009). Studies also suggest that perceived behavioral control can affect one's intentions to act pro-environmentally (the extent to which person is willing and ready to perform certain behavior; Fishbein & Ajzen, 2010). The stronger one's perceived behavioral control, the stronger their intentions to act pro-environmentally. For example, people who believed that they have control over their behavior to use transfer[10] services to reduce car use, had stronger intentions to use transfer services provided by the city, both for shopping and for commuting to work (de Groot & Steg, 2007b). Adolescents might not (yet) have control over certain behaviors, such as purchasing organic products or deciding how to commute to school. If adolescents think that they have limited possibilities and it is not up to them to engage in certain pro-environmental behaviors, they may also feel less morally obliged to engage in these behaviors and could hold weaker intentions to act pro-environmentally.

10 People arrive from distant districts or other cities to shop or to work. They leave their car at the city-provided parking lot and continue the trip on public transportation.

Second, access to behavior – the extent to which it is easy or difficult to access the means to perform behavior (Klöckner & Blöbaum, 2010) – is another factor that might directly explain adolescents' pro-environmental behavior. Adolescents might not have access to the means to act pro-environmentally. For example, access to clean drinking water in rural areas might be limited[11], therefore adolescents will drink bottled water; or will buy packaged meals, because there is no other option in grocery store. The easier is one's access to behavior and the stronger is perceived behavioral control to act pro-environmentally, the more likely one will act pro-environmentally (van den Broek et al., 2019)[12].

Third, the CADM further suggests that pro-environmental behavior could depend on habit. Strong habit – automatic actions formed in frequent, repetitive and stable situations in the past (van den Broek et al., 2019) – leads to consistent (dis)engagement in pro-environmental behavior, for example car use for daily commute to work or energy conservation while cooking food (Haustein et al., 2009; van den Broek et al., 2019). For adolescents, some pro-environmental behaviors (e.g., cycling to school) might be more habitual than others (e.g., organic grocery shopping).

All in all, both general environmental considerations and behavior-specific factors constituting the CADM model can explain (intentions to engage in) pro-environmental behaviors. Yet general environmental considerations offer more opportunities for interventions, because, due to their overarching nature, they can explain multiple pro-environmental behaviors, while behavior-specific factors are only for single behaviors. Yet, it is important to understand how well general environmental considerations can explain behaviors when compared to other factors among adolescents.

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11 State Food and Veterinary Service suggest that one fifth of Lithuania households use private water wells that are at risk of chemical and biological contamination (TV3, 2022).

12 The key difference between access to behavior and perceived behavioral control is that the former construct indicates the extent to which one realizes objective constrains or facilitators to perform behavior (e.g., unpackaged options are available in grocery store to reduce plastic use), while the latter construct indicates the extent to which one realizes one's subjective capabilities to engage in behavior (e.g., one has a feeling that can engage in behaviors to reduce plastic use).

#### *1.1.4.1 Overview of Method and Results of Chapter 5*

In Chapter 5 we explored in two studies to what extent general environmental considerations, namely biospheric values and environmental self-identity explain, via perceived personal norms, various pro-environmental behaviors of adolescents compared to behavior-specific factors indicated in the CADM model. We measured environmental considerations with the same instruments as indicated in subsections 1.1.2.1 and 1.1.3.1. Social norms, awareness of need and consequences, perceived behavioral control, access to behavior, habits and intentions were measured at a behavior-specific level with the instruments adopted from previous studies (Klöckner & Friedrichsmeier, 2011; Klöckner & Ohms, 2009; van der Werff et al., 2013a). The results of Study 1 (349, 54.7% female, $M_{age}$ = 16, $SD_{age}$ = 1, convenience sample) and Study 2 (508, 49% female, $M_{age}$ = 15.10, $SD_{age}$ = 1.49, nationally representative random sample) indicated that environmental considerations as well as the behavior-specific factors explained the use of bottled water (Study 1), taking one's own bag for shopping and giving away or selling unused items (Study 2) among adolescents reasonably well. Across these behaviors environmental considerations explained from 34% to 48% variance in intentions and from 15% to 46 % variance in behavior. While the behavior-specific factors explained from 33% to 54% variance in intentions and from 35% to 59% variance in behavior. Environmental considerations and behavior-specific factors explained little variance in purchasing unpackaged goods, 1% and 6% respectively, yet they explained the intentions to purchase unpackaged goods reasonably well: 34% and 38% respectively. These results show that environmental considerations and behavior-specific factors can explain pro-environmental behavior to a rather similar extent. Environmental considerations explained a little bit less variance, which is not surprising because they are less specific, but they still explained behavior reasonably well, comparable to the behavior-specific factors. Noteworthy, environmental considerations proved to be relevant factor that can explain multiple behaviors, besides the very specific factors. This makes environmental considerations relevant for interventions, as their main advantage is that by targeting them one could potentially change many specific pro-environmental behaviors, while by targeting behavior-specific factors one would need to target only one specific behavior. These results provide first evidence that environmental considerations being general constructs and relatively distant from behavior explain adolescents' behavior almost as well as constructs specific to behavior.

### 1.1.5 Relationship Between Environmental Considerations of Parents and Their Adolescent Children

If environmental considerations are indeed important determinants of pro-environmental behaviors, as suggested in this thesis, the next important question is how environmental considerations and behavior of adolescents could be possibly formed. In this section, we take the very first step in addressing this complex question. Based on previous research, we propose that family is an important basis where environmental considerations could emerge and form (Manfredo et al., 2017; Olkinuora, 1972; Schwartz, 1977), specifically, family members could influence each other's environmental considerations and behavior. Parents could play an important role in their adolescent children's formation of environmental considerations. Also, children could affect their parents' environmental considerations. The first step in understanding whether parents and their adolescent children could affect each other's environmental considerations is to test whether and to what extent environmental considerations of adolescents and their parents are related in the first place.

In adolescence, the development of values, identities and norms could be influenced by the family context (Friedlmeier & Trommsdorff, 2011; Grønhøj & Thøgersen, 2009; Knafo & Galansky, 2008; Roest et al., 2009). Adolescents may adopt environmental values, identities and norms prevalent in their family. This would result in positive relationships between environmental considerations and behavior of parents and their adolescent children. Yet adolescents may not necessarily adopt the environmental considerations of their parents. In fact, adolescents could even rebel against the values and norms of their parents and seek their own unique identity and moral standards, because this is a characteristic for this age group (Albert et al., 2013; Boykin McElhaney & Allen, 2001; Crocetti, 2017; Crocetti et al., 2008; Jager et al., 2015; Lansford et al., 2009; Pfeifer & Berkman, 2018). This might lead to environmental considerations of parents and their adolescent children being either not related or negatively related. On the other hand, parents could be influenced by their children's environmental considerations too, especially if adolescents are more engaged in environmental issues and initiate discussions at home or show examples of pro-environmental behavior. But parents may also not consider their child as a role model for environmental considerations and behavior. As the very first step in better understanding these relationships, we first of all test if environ-

mental considerations of adolescents and their parents, namely biospheric values, environmental self-identity and personal norms are at all related.

#### *1.1.5.1 Overview of Method and Results of Chapter 6*

To test the extent to which environmental considerations of parents and their adolescent children are related we conducted a study (Chapter 6) in a representative sample of adolescents (492, 49% female, $M_{age}$ = 15.11, $SD_{age}$ = 1.39) and their parents (492, 75.2% female, $M_{age}$ = 42.67, $SD_{age}$ = 6.68) in Lithuania. We measured environmental considerations with the same instruments as indicated in previous subsections. We used correlations to measure the relationship between parents and their adolescent children's environmental considerations and behavior; and SEM to measure the extent to which environmental considerations explain behavior of parents and their children. Results indicated a strong and positive relationship between environmental values, self-identity, and personal norms of parents and their adolescent children. Also, the own environmental considerations predicted various pro-environmental behaviors of both parents and adolescents. This is the first evidence that family could be a potentially important basis for shaping environmental considerations.

## 1.2 Summary

In this dissertation we aim to explore to what extent general environmental considerations are universal factors in explaining many different pro-environmental behaviors, especially in contexts that were not explored before and beyond adult samples. We first conduct a systematic literature review and meta-analysis to clarify the extent to which environmental self-identity is distinct from other constructs representing human-environment relationship, such as environmental identity and connectedness with nature (Chapter 2). This was an important step since environmental self-identity is a crucial link in the relationship between biospheric values and pro-environmental behavior, and it is a valuable target for interventions because it is more malleable than people's values. Next, based on the VIP model we aim to understand to what extent environmental considerations, namely biospheric values and environmental self-identity are universal in explaining various pro-environmental behaviors

among adults in context that was not studied before, namely Lithuania (Chapter 3 and 6) and among adolescents (Chapter 4 and 5). People in different contexts may prioritize other than environmental considerations when engaging in pro-environmental behaviors, which could hinder the effects of environmental considerations on those behaviors. In particular, in Lithuania, beside environmental issues, people are dealing with other social, demographic and economic issues that have more prominent, immediate effects on their lives, such as social inequalities, financial struggles and population decline in rural areas, which could prevent environmental considerations from guiding their behavior. While for adolescents, age related peculiarities such as prioritizing self-enhancement values might push particularly environmental considerations to the background and other concerns might be more important drivers of their pro-environmental behavior. Further, we explore how well general environmental considerations (the VIP model) compared to behavior-specific factors (the CADM model), explain various specific pro-environmental behavior of adolescents (Chapter 5). This is an important step because if interventions aim at general factors, it is essential to unravel how well these factors explain multiple behaviors when compared to factors specific to those behaviors. Finally, we look at the relationships between environmental considerations and pro-environmental behavior in the family context, namely between parents and their adolescent children, in order to get the very first insights into whether family context could potentially be an important basis for the development of individuals' environmental considerations (Chapter 6). Knowledge on the extent to which environmental considerations are relevant in explaining many pro-environmental behaviors beyond WEIRD countries and adult samples might be useful for stakeholders working in such countries and with such groups of people.

# CHAPTER 2

## Exploring the Relationship Between Connectedness with Nature, Environmental Identity, and Environmental Self-Identity: A Systematic Review and Meta-Analysis

Chapter 2 is built on the following publication: Balundė, A., Jovarauskaitė, L., & Poškus, M. S. (2019). Exploring the Relationship Between Connectedness with Nature, Environmental Identity, and Environmental Self-Identity: A Systematic Review and Meta-Analysis. SAGE Open.
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## Abstract

A meta-analysis was carried out to investigate the relationship between connectedness with nature, environmental identity, and environmental self-identity. Through meta-analyzing these relationships, we are able to assess the true estimate of their magnitude. The results revealed a strong correlation between measures of connectedness with nature and environmental identity ($r$ = .75 [0.67, 0.83], $k$ = 11) as well as environmental self-identity ($r$ = .57 [.31, .84], $k$ = 5). Further moderation analysis indicated that the relationship between connectedness with nature and environmental identity is different for graphical and questionnaire instruments used for assessing connectedness with nature; the aggregated correlation for graphical instruments, such as Venn diagrams measuring human-nature relationship ($r$ = .62 [.56, .67], $k$ = 9) was significantly lower than for questionnaires ($r$ = .82 [.74, .91], $k$ = 9). We suggest revisiting the various instruments assessing human–nature relatedness to maximize unique variance among them.

## 2.1 Introduction

Researchers have been spending considerable effort over the last couple of decades on developing the constructs of human–nature relations, as well as the instruments that measure them (Brügger et al., 2011; Martin & Czellar, 2017; Olivos & Clayton, 2017; Restall & Conrad, 2015; Tam, 2013). The result of this effort is a plethora of psychological constructs, such as connection with nature, environmental identity, and others. Many of the constructs stem from the self-concept theory (Baumeister, 1998; Marsh, 1990); despite their common theoretical roots, the instruments measuring them focus on different aspects and have differing aims and evaluation forms (e.g., graphic vs. text). In many cases, measures of these constructs are highly correlated (Brügger et al., 2011; Davis et al., 2011; Martin & Czellar, 2017; Tam, 2013), and we sought a meta-analytical estimate of the strength of this relationship. We have carried out a systematic review and a meta-analysis of the correlations between constructs that deal with connectedness with nature, environmental identity, and environmental self-identity. Specifically, we tested the relationship between connectedness with nature and environmental identity, and connectedness with nature and environmental self-identity. We also tested the moderating effect of assessment instrument type on the relationship between connectedness with nature and environmental identity. In the following sections, we discuss each concept that is relevant to the analysis.

### 2.1.1 Connectedness with Nature

Schultz (2002) was among the first to conceptualize the constructs of human–nature relations through the perspective of conservation psychology. Schultz (2002) describes inclusion of self in nature as "the understanding that an individual has of her place in nature, that s/he places on nature, and his/her actions that impact the natural environment" (p. 67). Connection with nature is said to have three psychological components—cognitive, affective, and behavioral—as well as three core structural components—connectedness, caring, and commitment (Schultz, 2002). In Schultz's (2002) general framework of human–nature relations, connectedness leads to caring, which, in turn, leads to pro-environmental actions.

Focusing on these specific aforementioned components of connectedness with nature, there is a variety of means through which the concept can be operationalized, for example, experiential (Nisbet & Zelenski, 2013), attitudinal (Brügger et al., 2011), or physical connection with the natural environment (Nisbet et al., 2009). From these components stem a number of specific operationalizations: disposition to connect with nature (Brügger et al., 2011); an emotional connection to the natural world (Hinds & Sparks, 2008; Kals et al., 1999; Mayer & Frantz, 2004); connectivity with nature, which refers to the sense of empathy in terms of unity with nature and self (Dutcher et al., 2007); psychological attachment and a long-term orientation toward nature (Davis et al., 2009); the perception of the relationship between nature and self (Martin & Czellar, 2017; Schultz, 2001, 2002; Schultz et al., 2004); and an implicit association with nature (Schultz & Tabanico, 2007). It can be measured with regular text-based questionnaire items (Brügger et al., 2011) or spatial metaphor representations (Martin & Czellar, 2017; Schultz, 2001). This variety is based on ample theoretical differences and enables a comprehensive picture of connectedness with nature, yet these constructs are strongly related (Tam, 2013).

### 2.1.2 Environmental Identity

Another construct that reflects some part of human–nature relations is environmental identity (Clayton, 2003), which is defined thusly: ". . . environmental identity is one part of the way in which people form their self-concept; a sense of connection to some parts of the nonhuman natural environment, based on history, emotional attachment, and/or similarity, that affects the way in which we perceive and act towards the world; a belief that the environment is important to us and an important part of who we are (Clayton, 2003, pp. 45-46)."

Authors claim, that connectedness with nature and environmental identity are similar, but instruments that measure them focus on different aspects of the same underlying construct and are differently related to pro-environmental behavior (Frantz & Mayer, 2014; Tam, 2013). For example, Brügger et al. (2011) found that environmental identity, but not connectedness with nature, inclusions of nature in self, or implicit association with nature had a statistically significant relationship with a general measure of pro-environmental behavior. Furthermore, Tam (2013) found that even though environmental

identity and connectedness with nature (among other nature relatedness constructs) do converge into a single higher factor, these measures contribute unique variance to explain pro-environmental behavior. By the same token, Olivos and Aragonés (2011) suggest that environmental identity consists of four dimensions: environmentalism, appreciation of nature, enjoying nature, and environmental identity. A closer inspection of the environmental identity measure reveals that its scales "enjoying nature" and "appreciation of nature" strongly resemble measures of connectedness with nature, whereas "environmental identity" (as a separate subscale) is distinct and offers unique variance in predicting pro-environmental behaviors (Olivos & Aragonés, 2011).

### 2.1.3 Environmental Self-Identity

Environmental self-identity is conceptually distinct from environmental identity developed by Clayton (2003) (Olivos & Clayton, 2017; van der Werff et al., 2013b), as well as from connectedness with nature introduced by Schultz (2002). However, some authors suggest that it can be potentially interrelated with concepts that reflect human–nature relationships (van der Werff et al., 2013b), or that environmental self-identity is a certain type of operationalization of environmental identity (Kashima et al., 2014).

Environmental self-identity is defined as "the extent to which one sees oneself as a type of person whose actions are environmentally-friendly" (van der Werff et al., 2013b, p. 1258). Environmental self-identity can be investigated in specific or in generic terms; one can address specific pro-environmental behaviors or general ones (van der Werff et al., 2013b; Whitmarsh & O'Neill, 2010). Specific environmental self-identities refer to relevant outcomes of one's identity, for example, one can identify as a cycler, a recycler, a reuser, thus in effect identifying with a certain group. Generic environmental self-identity refers to a mixture of relevant outcomes, for example, one identifies as pro-environmental if one cycles, recycles, and reuses. Thus, environmental self-identity is linked to specific pro-environmental actions (Cook et al., 2002; Dean et al., 2012; Sparks & Shepherd, 1992; Stets & Biga, 2003; van der Werff et al., 2013b; Whitmarsh & O'Neill, 2010) or a mixture of these actions (Kashima et al., 2014; van der Werff et al., 2013a, 2013b, 2014a, 2014b; Whitmarsh & O'Neill, 2010). On the one hand, environmental identity (feeling as a part of nature) might be related to environmental self-identity, in the sense that people who

enjoy nature might be more likely to act in a pro-environmental manner (e.g., Nisbet et al., 2009). On the other hand, enjoying nature does not guarantee that one will actively engage in pro-environmental actions (van der Werff et al., 2013b); similarly, involvement in pro-environmental actions does not necessarily reflect one's connectedness with the natural environment (Olivos & Clayton, 2017).

### 2.1.4 The Present Study

As was mentioned, connectedness with nature and environmental identity have common conceptual roots, yet distinct theoretical paradigms. Instruments that measure them differ in their focus and aim. Research indicates that connectedness with nature and environmental identity are strongly related, and, thus, we assess this relationship meta-analytically. Based on the assumption that environmental self-identity could potentially reflect some parts of human–nature relationship, we also included it into the analysis. Thus, the aim of the present study is to investigate the relationship between connectedness with nature and environmental identity, and connectedness with nature and environmental self-identity by conducting a systematic review and meta-analysis on the correlations between these constructs. To our knowledge, the relationship among these constructs has not yet been meta-analyzed. An aggregated effect size would provide a robust estimate of the true correlation between the constructs in question. First, we have chosen to look at the relationship between connectedness with nature and environmental identity. Second, we investigated links between connectedness with nature and environmental self-identity. Finally, we conducted a moderated analysis of the relationship of connectedness with nature with environmental identity by splitting the sample into groups where connectedness with nature was assessed either with graphical or with questionnaire measures.

## 2.2 Method

The following describes all meta-analytic decisions that were made in gathering the data.

### 2.2.1 Eligibility Criteria

Studies were included in the analysis if they met the following criteria: (a) a correlation between connectedness with nature and either environmental identity or environmental self-identity was obtainable from the study, and (b) the source is scholarly and peer-reviewed. Editorials, reviews, meta-analyses, and conference papers were excluded from the analysis.

### 2.2.2 Search Strategy and Data Sources

Two of the authors of the present study independently carried out a search in eight databases. The search string used in the present study was the following: ("environmental identity" OR "environmental self!identity" OR "pro!environmental self!identity") AND ("connectedness with nature" OR "connectedness to nature" OR "nature connectedness" OR "human nature relationship" OR "inclusion of nature in self" OR "nature relatedness" OR "implicit association with nature"). The search string was modified slightly in several cases to function properly on some search platforms. The publication date range was set from onset of the database to October 2017. The total number of articles that matched the search string from each database is presented in Table 1.

**Table 1** Search Sources and Results

| Database | Number of articles found |
|---|---|
| Clarivate Analytics Web of Science | 235 |
| ERIC | 185 |
| Google Scholar | 580 |
| GreenFile | 272 |
| Science Direct | 278 |
| Scopus | 139 |
| SocINDEX | 322 |
| PsyARTICLES | 440 |
| **Total** | 2451 |

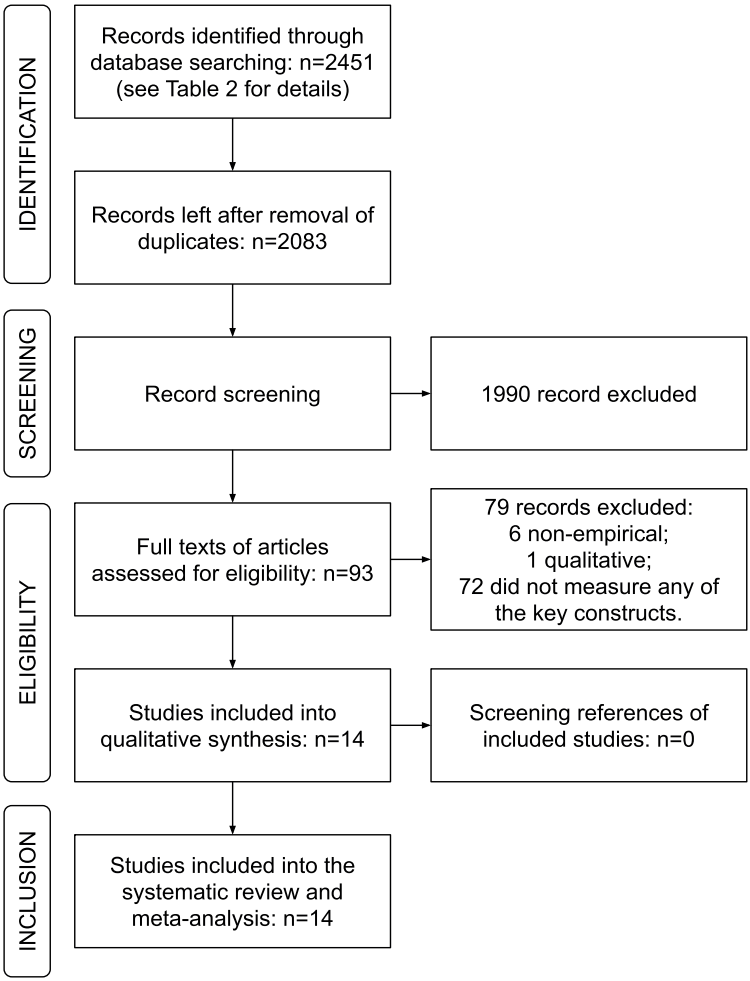
### 2.2.3 Study Selection

We used ENDNOTE to identify and exclude duplicates from the analysis. After the duplicates were removed, two reviewers independently screened the titles and abstracts of the remaining studies, and any study that did not contain connectedness with nature, environmental identity, or environmental self-identity was removed from further analysis. If it was unclear from an article's title and abstract whether the article is suitable for inclusion, the article was read in full. Those articles that were chosen as eligible were read thoroughly, and, based on our eligibility criteria, any irrelevant articles were excluded from further analysis. The reference lists of the selected articles were screened for relevant studies; no additional studies were found based on reference screening. A step-by-step description of our screening process is presented in Figure 1.

A standardized form was used for coding. The form included the following: (a) authors of the study; (b) publication year; (c) publication type; (d) sample characteristics (region, type, size, gender distribution, age range, and mean); (e) measures used in the study to assess connectedness with nature, environmental identity, and environmental self-identity; (f) correlation coefficients between constructs of interest; and (g) internal consistency of the measures used.

To ensure interrater reliability, we followed the procedure suggested by Crocetti (2015). Two researchers with expertise in environmental psychology literature selected and evaluated the selected studies separately. The

**Figure 1** Article Screening and Inclusion Procedure




agreement score between the two raters (McGinn et al., 2004) was $\kappa$ = .88 in selecting studies based on their eligibility criteria. A Cohen's $\kappa$ of .6 or above indicates acceptable interrater reliability and anything above .8 is considered very reliable (Landis & Koch, 1977). The initial misunderstanding and incongruence in determining eligibility was due to the convoluted nature of the

constructs being evaluated (see Dutcher et al., 2007), and after some debate, all inconsistencies between the raters were resolved.

### 2.2.4 Validity of Included Studies

It is common to incorporate the assessment of the validity of the studies included in systematic reviews (Higgins & Green, 2011), as well as to consider this as an eligibility criterion (Johnson & Eagly, 2014). We agreed to confer whether any of the studies raised any questions; however, we did not formalize any specific validity criteria when screening for studies. Throughout the screening process, we did not encounter any cases that would raise our concerns regarding their validity.

## 2.3 Results

The 14 studies that fit the eligibility criteria of the present study are listed in Table 2. One of the included studies can be considered as truly representative (i.e., Hine et al., 2013), while most studies included in the analysis were conducted with student samples. Two of the included studies were conducted in the United States, two in Australia, and one in China, whereas the rest were conducted in Europe, indicating that the results are mostly biased toward representing Europeans. As is often the case with convenience samples of students, females are more represented in the included studies.

**Table 2** Characteristics of the Included Studies

| Author(s) | Year | Sample type | Region | Participant age (range, *M (SD)*) | Females (%) |
|---|---|---|---|---|---|
| 1. Brügger et al | 2011 | Students | Switzerland | 18 to 80, 34.05 (15.30) | 45.16 |
| 2. Davis et al. | 2011 | Students | USA | 17 to 38, 22.00 (3.07) | 57.26 |
| 3. Hinds & Sparks | 2008 | Students | UK | 18 to 53, 21.70 (n/a) | 83.40 |
| 4. Hine et al.[a] | 2013 | General population | Australia | 15 to 108, 45.82 (14.89) | 53 |
| 5. Karlegger[b] | 2010 | Convenient | Germany | n/a | n/a |
| 6. Kashima et al. | 2014 | General population | Australia | 18 to 70, 34.05 (15.30) | 67 |
| 7. Lokhorst et al. | 2014 | Convenient, landowners | Netherlands | n/a, 35.17 (10.16) | 11.30 |
| 8. Mayer & Frantz | 2004 | Students<br>Other | USA | n/a<br>14 to 89, 36.00 (19.00) | 58.82<br>65.92 |
| 9. Olivos & Aragonés | 2011 | Students | Spain | n/a, 21.04 (3.58) | 81 |
| 10. Olivos & Aragonés | 2013 | Students | Spain | n/a, 21.59 (4.98) | 85 |
| 11. Olivos et al. | 2011 | Student | Spain | n/a, 20.00 (2.25) | 82 |
| 12. Piskóti | 2015 | Students | Hungary | n/a, 21.55 (n/a) | 58.70 |
| 13. Prévot et al. | 2016 | Students | France | n/a | n/a |
| 14. Tam | 2013 | Students Other | China | n/a, 20.36 (1.34)<br>17 to 81, 33.43 (13.20) | 45.34<br>63.78 |

*Note.* [a] This is the only included study that used a stratified representative sample. [b] The author was contacted to provide information about the study; the author provided information on the correlation coefficients among the constructs of interest, but did not provide full information about the sample characteristics.

A total of 41 effect sizes could be extracted from the included studies (Table 3). However, to remove intra-study bias, only one effect size was used per sample. A single effect size from each sample was derived by averaging all eligible effect sizes from that sample, providing a robust estimate of the effect in that study. The standard errors for correlations were computed based on their sample size (Cohen et al., 2002), thus automatically weighing the studies in the meta-analysis, to give more weight to effects derived from larger samples. Where possible, the correlation coefficients were corrected for attenuation of the measures to produce the actual effect sizes (Charles, 2005; Howitt & Cramer, 2011).

**Table 3** Measures and Effect Sizes of the Included Studies

| Reference | Connectedness with nature | | Environmental identity and environmental self-identity | | N | *r (SE)* | Corrected *r (SE)* |
|---|---|---|---|---|---|---|---|
| | **Measure** | **α** | **Measure** | **α** | | | |
| 1. Brügger et al (2011) | Connectedness to nature Scale (CNS; Mayer & Frantz, 2004) | .80 | Environmental Identity (EID; Clayton, 2003) | .93 | 1309 | .67 (.02) | .78 (.02) |
| | Inclusion of nature in one's self (INS; Schultz, 2001) | 1[a] | | | | .60 (.02) | .62 (.02) |
| | Disposition to connect with nature (DCB; Beckers, 2005) | .89 | | | | .72 (.02) | .79 (.02) |
| 2. Davis et al. (2011) | Inclusion of nature in one's self (Davis et al., 2009; INS; Schultz, 2001) | 1 | Environmental Identity (EID; Clayton, 2003) | .95 | 248 | .57 (.05) | .58 (.05) |
| | Connectedness to nature Scale (CNS; Mayer & Frantz, 2004) | .85 | | | | .80 (.04) | .89 (.03) |
| 3. Hinds & Sparks (2008) | Affective connection (AC; was measured with the items adapted from Thompson & Barton, 1994) | .77 | Environmental Identity Questions, (EI: Hinds & Sparks, 2008) | .75 | 199 | .80 (.04) | 1 (.01)[b] |
| 4. Hine et al. (2013) | Connection to nature six items adopted from earlier studies (impossible to track from which studies) | .94 | Green self-identity three items adopted from earlier studies (impossible to track from which studies) | .85 | 3096 | .62 (.01) | .69 (.01) |
| 5. Karlegger (2010) | Connectedness to nature Scale (CNS; Mayer & Frantz, 2004) | .85 | Environmental Identity (EID; Clayton, 2003) | .91 | 119[c] | .71 (.07) | .81 (.05) |
| | Nature relatedness (NR; Nisbet et al., 2009) | .60 | | | | .36 (.09) | .49 (.08) |
| | Single item capturing the bond with nature (Nisbet et al., 2009) | | | | | .58 (.08) | .61 (.07) |
| | Inclusion of nature in one's self (Davis et al., 2009; INS; Schultz, 2001) | 1 | | | | .52 (.08) | .55 (.08) |

| Reference | Connectedness with nature | | Environmental identity and environmental self-identity | | N | *r (SE)* | Corrected *r (SE)* |
|---|---|---|---|---|---|---|---|
| | **Measure** | **α** | **Measure** | **α** | | | |
| 6. Kashima et al. (2014) | Human-nature relationship (HNR; Schultz, 2002) | 1 | Environmentalist identity (EI; Whitmarsh & O'Neill, 2010) | .73 | 1093 | .15 (.03) | .18 (.03) |
| | | | Environmental strivings (ES; Emmons, 1986) | .87 | | .12 (.03) | .13 (.03) |
| 7. Lokhorst et al. (2014) | Connectedness to nature (CTN; Gosling & Williams, 2010) | .80 | Self-identity (Terry et al., 1999) | .86 | 94 | .33 (.03) | .40 (.03) |
| 8.1 Mayer & Frantz (2004) | Connectedness to nature scale (CNS; Mayer & Frantz, 2004) | .84 | Identity as an Environmentalist (IE; Mayer & Frantz, 2004) | .74 | 102 | .56 (.08) | .71 (.07) |
| 8.2 Mayer & Frantz (2004) | Connectedness to nature scale (CNS; Mayer & Frantz, 2004) | .79 | Identity as an Environmentalist (IE; Mayer & Frantz, 2004) | .55 | 135 | .61 (.07) | .93 (.03) |
| 9. Olivos & Aragonés (2011) | Connectedness to nature Scale (CNS; Mayer & Frantz, 2004) | .79 | Environmental Identity (EID, Clayton, 2003. (extracted 4 factors: Environmental identity, Enjoying nature, Appreciation of nature, Environmentalism) | .90 | 282 | .69 (.04)<br>.47 (.05)<br>.47 (.05)<br>.54 (.05) | .82 (.03)<br>.56 (.05)<br>.56 (.05)<br>.64 (.05) |
| | Inclusion of nature in one's self (INS; Schultz, 2001) | 1 | | | | .53 (.05)<br>.55 (.05)<br>.45 (.05)<br>.46 (.05) | .56 (.05)<br>.58 (.05)<br>.47 (.05)<br>.48 (.05) |
| 10. Olivos & Aragonés (2013) | Inclusion of nature in one's self (INS; Schultz, 2001) | 1 | Environmental Identity (EID; Clayton, 2003) | .92 | 71 | .70 (.09) | .73 (.08) |
| | Connectedness to nature Scale (CNS; Mayer & Frantz, 2004) | .79 | | | | .72 (.08) | .84 (.06) |

| Reference | Connectedness with nature | | Environmental identity and environmental self-identity | | N | *r (SE)* | Corrected *r (SE)* |
|---|---|---|---|---|---|---|---|
| | **Measure** | **α** | **Measure** | **α** | | | |
| 11. Olivos et al. (2011) | Connectedness to nature Scale (CNS; Mayer & Frantz, 2004) | .79 | Environmental Identity (EID; Clayton, 2003) | .89 | 204 | .63 (.05) | .75 (.05) |
| 12. Piskóti (2015) | Implicit association test (IAT-Nature, Schultz, 2004) | 1 | Environmental Identity (EID; Clayton, 2003) | .88 | 196 | .54 (.06) | .58 (.06) |
| 13. Prevot et al. (2016) | Inclusion of nature in self (INS; Schultz, 2002) | 1 | Environmental Identity (EID; Clayton, 2003) | .82 | 919 | .63 (.03) | .70 (.02) |
| 14.1 Tam (2013) | Commitment to nature (COM; Davis et al., 2009 ) | .83 | Environmental Identity (EID; Clayton, 2003) | .89 | 355 | .85 (.03) | .99 (.01) |
| | Connectedness to nature (CNS; Mayer & Frantz,, 2004) | .79 | | | | .81 (.03) | .97 (.01) |
| | Connectivity with nature (CWN; Dutcher et al., 2007) | .61 | | | | .75 (.04) | 1 (.01) |
| | Emotional affinity toward nature (EATN; Kals et al., 1999) | .84 | | | | .76 (.03) | .88 (.03) |
| | Inclusion of nature in self (INS; Schultz, 2001) | 1 | | | | .67 (.04) | .71 (.04) |
| | Nature relatedness (NR; Nisbet et al., 2009) | .83 | | | | .85 (.03) | .99 (.01) |
| 14.2 Tam (2013) | Commitment to nature (COM; Davis et al., 2009 ) | .93 | Environmental Identity (EID; Clayton, 2003) | .96 | 185 | .85 (.04) | .90 (.03) |
| | Connectedness to nature (CNS; Mayer & Frantz,, 2004) | .89 | | | | .77 (.05) | .83 (.04) |
| | Connectivity with nature (CWN; Dutcher et al., 2007) | .86 | | | | .66 (.06) | .73 (.05) |

| Reference | Connectedness with nature | | Environmental identity and environmental self-identity | | N | *r (SE)* | Corrected *r (SE)* |
|---|---|---|---|---|---|---|---|
| | **Measure** | **α** | **Measure** | **α** | | | |
| | Emotional affinity toward nature (EATN; Kals et al., 1999) | .93 | | | | .79 (.05) | .84 (.04) |
| | Inclusion of nature in self (INS; Schultz, 2001) | 1 | | | | .46 (.07) | .47 (.07) |
| | Nature relatedness (NR; Nisbet et al., 2009) | .90 | | | | .82 (.04) | .88 (.03) |

*Note.* Note. All reported correlations are significant at least at the .01 level. CNS = connectedness to nature scale; CTN = connectedness to nature; EI = environmental identity; EID = environmental identity scale; INS = inclusion of nature in one's self; NR = nature relatedness; IE = identity as an environmentalist; COM = Commitment to Nature; CWN = connectivity with nature; EATN = emotional affinity toward nature. [a]In cases where connectedness with nature was assessed graphically or assessed with a single item, the internal consistency of the measure was assumed to be 1. [b]In cases where the corrected *r* was equal to or exceeded 1, the SE was assumed to be .01 for computational purposes. Rows with a highlighted background indicate cases where connectedness with nature was correlated with environmental self-identity, whereas rows with a non-highlighted background indicate cases where connectedness with nature was correlated with EID. [c]Sample size, correlations among constructs, and internal consistency values were provided by the author.

JASP v0.8.6 was used for statistical analysis (JASP Team, 2018). A random-effects restricted maximum likelihood estimation revealed that the effect was extremely high ($r$ = .75 [.67, .83], $k$ = 11) for the relationship between connectedness with nature and environmental identity (Figure 2). The rank correlation test for the funnel asymmetry (Kendall's $\tau$ = .02, $p$ = .1) showed no bias, whereas the Egger's test ($Z$ = –2.36, $p$ = .02) indicated asymmetry in the funnel plot (Figure 3). A fail-safe $N$ of 34,022, with a target significance of .05 and an observed significance of zero would be needed to make the overall effect insignificant.

**Figure 2** Forest Plot of Correlations Between Connectedness with Nature and Environmental Identity

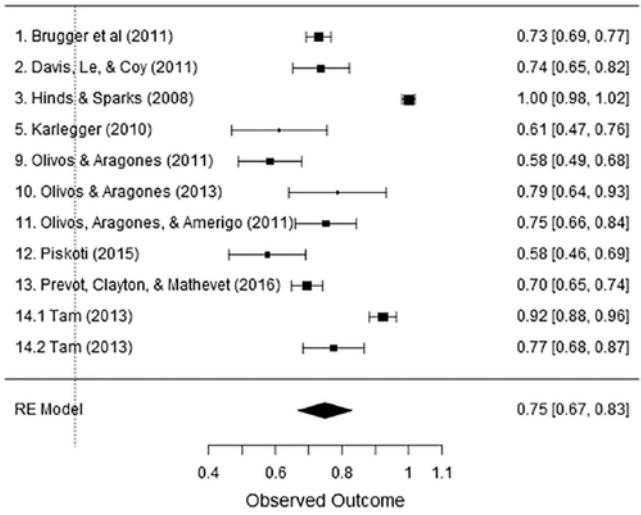
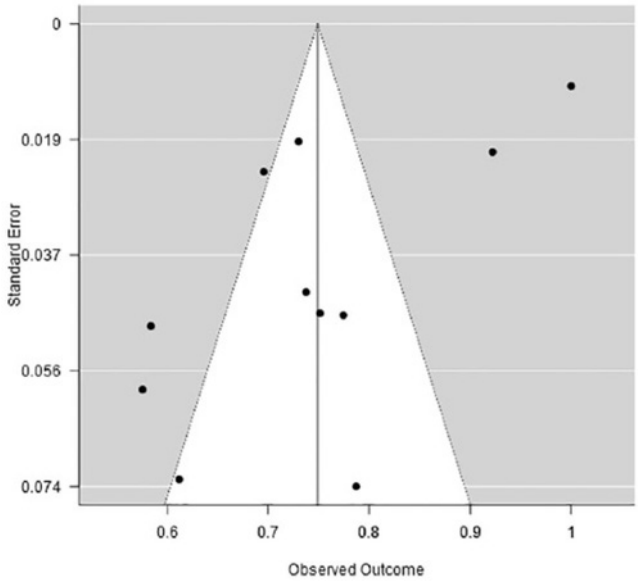



**Figure 3** Funnel Plot for Correlations Between Connectedness with Nature and Environmental Identity



The same estimation was applied for the relationship between connectedness with nature and environmental self-identity (Figure 4). The effect was also found to be very high ($r$ = .57 [.31, .84], $k$ = 5). Both the rank correlation test for the funnel asymmetry (Kendall's $\tau$ = −.20, $p$ = .82) and Egger's test ($Z$ = 0.32, $p$ = .75) indicated that the effect is not biased (Figure 5). A fail-safe $N$ of 4,567, with a target significance of .05 and an observed significance of zero would be needed to make the overall effect insignificant. Mathematically, there is no significant difference between the strength of the relationship of connectedness with nature with environmental identity or connectedness with nature with environmental self-identity.

**Figure 4** Forest Plot of Correlations Between Connectedness with Nature and Environmental Self-Identity

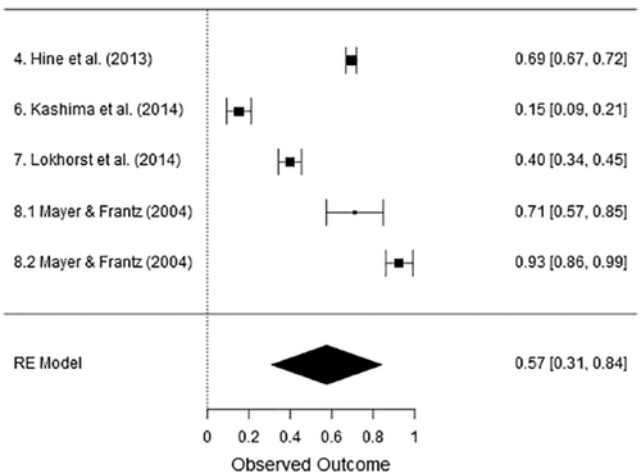
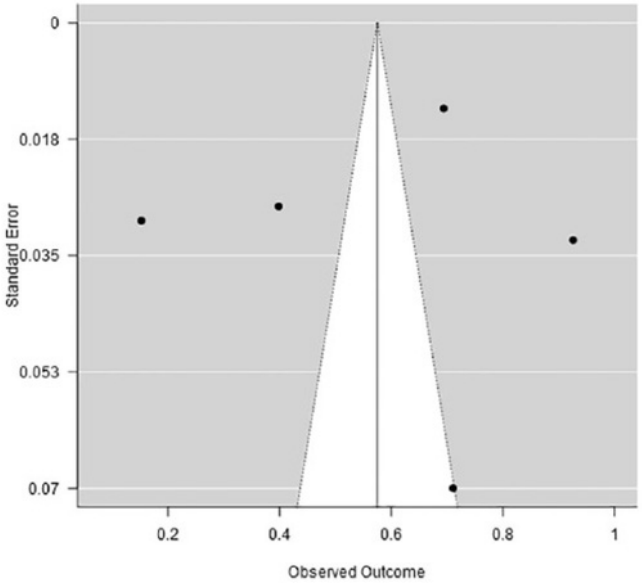


**Figure 5** Funnel Plot for Correlations Between Connectedness with Nature and Environmental Self-Identity




Heterogeneity tests indicated that the included effects for the relationship between connectedness with nature and environmental identity are heterogeneous—residual heterogeneity, $Q(10) = 373.9$, $p < .01$; $I^2 = 95.71\%$—supporting further investigation of moderated effects. Two separate analyses were run to identify whether the observed relationship is different with different assessment methods of connectedness with nature, namely questionnaire items vs. graphical assessment. In both cases, this only slightly improved heterogeneity indicators; however, the observed results indicated significant differences among conditions, showing that the effects are moderated (see supplementary material for detailed outputs of separate analyses and for data files: https://osf.io/tnk7c). Moderation analysis is not reported for the relationship between connectedness with nature and environmental self-identity due to insufficient number of cases.

In effects derived through questionnaire measures of connectedness with nature and measures of environmental identity, the overall effect is higher

($r$ = .82 [.74, .91], $k$ = 9) than when connectedness with nature was assessed graphically ($r$ = .62 [.56, .67], $k$ = 9). Based on the nonoverlapping confidence intervals, this difference is statistically significant at least at the .05 level. This indicates that the relationship between connectedness with nature and environmental identity is stronger when both constructs are assessed using a common method. However, it must be noted that although correlation coefficients between questionnaire measures were corrected for attenuation, this correction is only one-sided when correlating with graphical measures because we are forced to assume a single-item measure to be functioning perfectly. This difference between measures might account for at least a part of the observed difference in overall effects.

## 2.4 Discussion

### 2.4.1 Relations Between Connectedness with Nature and Environmental Identity, and Between Connectedness with Nature and Environmental Self-Identity

Researchers in the field came up with different constructs of one's relationship to nature, which are sound in theory, yet highly correlated (Brügger et al., 2011; Davis et al., 2011; Martin & Czellar, 2016; Tam, 2013). The results of the present meta-analysis are in line with past studies and indicate that connectedness with nature and environmental identity are indeed very highly correlated. In addition, a similarly high correlation was found between connectedness with nature and environmental self-identity. In the following sections, we discuss the implications of these strong relationships between the constructs of human–nature relations.

A correlation coefficient higher than .50 is traditionally assumed to indicate a strong effect (Cooper & Findley, 1982), while more recent research shows that the average effect size for a correlation in social psychology is only .21, with effects higher than .50 being very uncommon (Richard et al., 2003). In this study, there is an indication that measures of connectedness with nature and measures of environmental identity share a great amount of variance. According to classical test theory (Campbell & Fiske, 1959; Cronbach & Meehl, 1955; Reichardt & Coleman, 1995; Westen & Rosenthal, 2003), this high shared

variance could potentially point to these measures being indistinguishable in some cases; thus, having different instruments for them might be superfluous. However, some studies have shown that measures of connectedness with nature and environmental identity do have some unique predictive power (Brügger et al., 2011; Tam, 2013). We argue that strong links among various theoretically distinct constructs representing the human–nature relationship imply strong links among the elements of these concepts (e.g., identification with the natural environment, Clayton, 2003; and the emotional aspect of connection with nature, Schultz, 2001, among others). This is in line with what was theorized by Schultz (2001), where he argued that the broader inclusion with nature construct comprised causally interrelated elements such as caring, connection, and commitment, where commitment is possible only in the presence of caring and connection. Similarly, the theory of environmental identity developed by Clayton (2003) emphasizes the interrelated aspects of the human–nature relationship. Specifically, contact with nature (or certain elements of nature) can invoke the sense of belonging to or being a part of nature; this, in turn, could lead to the development of the relationship between a person and nature, which further can have an effect on behavior that is relevant in maintaining this relationship, for example, volunteering in anti-logging campaigns or wildlife protection organizations.

We took these two independent concepts of environmental identity and inclusion with nature as a case in point, to demonstrate that the human–nature relationship can be seen through differing theoretical lenses (either rooted in identity/self-concept or cognitive-affective-behavioral structures), yet at the same time being of equal importance in this relationship and having the potential, as it was already suggested by Tam (2013), to be unified by a common conceptual framework. The purpose of this unifying approach could be to find communalities of various human–nature relationship constructs, yet emphasizing their unique contribution on the conceptual as well as the methodological and measurement level. A comprehensive assessment of the various human–nature relations constructs could potentially indicate which particular aspects of these constructs lead to desirable proenvironmental outcomes; this would enable more precise interventions for promoting proenvironmental behavior. Furthermore, a comprehensive instrument of all human–nature relat-

edness constructs would allow a holistic pattern-based understanding of various individuals through the exploration of typical profiles of various samples.

### 2.4.2 The Effect of Instrument Type

The form in which a question is asked and the response form can affect the answers to a question (Christian & Dillman, 2004). Thus, the observed significant difference in the relationship between connectedness with nature and environmental identity when the assessment method of connectedness with nature is either graphical or through a questionnaire might partly be due to the difference in response tendencies to questions that differ in form. Operationalizing connectedness with nature through graphical means introduces method variance (Westen & Rosenthal, 2003) that is different from instances, when connectedness with nature is assessed through questionnaires. We, therefore, argue that having two distinct approaches in assessing one's connectedness with nature (through semiprojective means and through self-report) is needed, and one approach should not be abandoned in favor of the other, because different means are effective in reaching different demographics or specific samples (Martin & Czellar, 2016).

### 2.4.3 Recommendations

Internal consistency could potentially be an important factor in understanding correlations between human–nature relationship constructs. This study shows that, in some cases, the internal consistency of environmental identity (Clayton, 2003) is as modest as .57; in other cases, it reaches a whopping .96. Measures of connectedness with nature are similar in this regard. Although having good internal consistency is preferred, one must be mindful of alpha coefficients that are too high (Streiner, 2003). If a measure that is said to reflect a broad construct has very high internal consistency, it might be indicative of the measured construct only being represented in part (Streiner, 2003). Because both connectedness with nature and environmental identity are quite broad concepts, one would expect the measures of these constructs to have more moderate alpha coefficients, let alone being correlated with one another with effects so high that they might lose their uniqueness (see Table 3 for examples of correlations of .9 and above).

One of the possible solutions to the aforementioned problem is to perform factor analysis to identify whether a construct is uni- or multidimensional. Some authors have used factor analysis to crystallize the various components of measures that deal with human–nature relations. For example, Olivos and Aragonés (2011) factorized the Clayton's (2003) environmental identity scale and extracted four subscales that represented different aspects of human–nature relations. Furthermore, Navarro and colleagues performed factor analysis on Mayer and Frantz's (2004) connectedness to nature scale (Navarro et al., 2017). This helped to refine the instruments by excluding items that failed to represent constructs as well as threatened internal consistency of the instrument. Similarly, Pasca and colleagues refined Mayer and Frantz's (2004) connectedness to nature scale by checking the scale's dimensionality within the framework of item response theory and found that several items failed to represent the construct of connectedness with nature (Pasca et al., 2017).

Reworking the particular items used in scales assessing connectedness with nature and environmental identity could be helpful to overall improve the unique predictive power of these instruments. For example, Brügger and colleagues (2011) state that the "connectedness to nature scale and the environmental identity measure also partly reflect people's environmental concern and not exclusively connection with nature" (p. 330). In addition, the various questionnaire measures of human–nature relationships include items that refer to past behavior, attitudes, identification with groups, affective measures, and so forth (Brick et al., 2017; Hinds & Sparks, 2008; Sparks & Guthrie, 1998; Stets & Biga, 2003). For example, the disposition to connect with nature scale (Brügger et al., 2011) consists of items that not only reflect connectedness with nature (e.g., "I feel the need to be out in nature") but also reflect behavior (e.g., "I collect objects from nature such as stones, butterflies, or insects"), affective aspects (e.g., "I mourn the loss of pets"), and personal attitudes (e.g., "Indoor plants are part of the family"). Furthermore, the commitment to nature scale (Davis et al., 2009), which is intended to operationalize the commitment part of human–nature relations (Schultz, 2001), comprises items that reflect not only commitment (e.g., "I feel committed to keeping the best interests of the environment in mind") but also connection with nature (e.g., "It seems to me

that humans and the environment are interdependent") or attachment (e.g., "I feel very attached to the natural environment").

Another aspect that should be taken into account is the way the measures are presented in a questionnaire. There is a substantial possibility that the constructs that are the object of the present study might prime respondents' answers because of question order effects. We suggest, where possible, to present questionnaire items of all measures in random order so as not to prime respondents with specific constructs. Presenting all items together in random order makes everything salient at the same time (Poškus & Sadauskaitė, 2015; Siminski, 2006); thus, the respondent answers to items with a common framework, but there is less opportunity for specific directional priming of one measure affecting the other. Only a few studies that were included in this meta-analysis addressed such biases. For example, in a study conducted by Tam (2013), the presentation order of measures was randomized; the test–retest procedure was performed in studies conducted by Olivos, Aragonés, and Amérigo (2011) as well as Mayer and Frantz (2004). Future studies that deal with constructs of human–nature relatedness should pay more attention to order effects and other possible biasing factors.

### 2.4.4 Future Directions and Limitations

There are several other constructs of human–nature relatedness besides the ones we included in the present study. Future research that explores the methodological soundness of human–nature connectedness and the various instruments and conceptual differences of these concepts could look into such constructs as visions of nature (van den Born et al., 2006) or the new environmental/ecological paradigm (Dunlap, 2008).

In the present study, we did not have enough cases to draw firm conclusions on the instruments used to assess environmental self-identity; nevertheless, this construct could also be included in exploratory analyses of various human–nature relatedness instruments. In addition, as can be seen in Table 2, Western countries are overrepresented in the present meta-analysis and the results might not be as representative of non-Western societies.

### 2.4.5 Concluding Remarks

Connectedness with nature is very strongly correlated to environmental identity as well as to environmental self-identity. The correlation between connectedness with nature and environmental identity is moderated by the type of assessment method used for connectedness with nature: The effect is significantly higher when both connectedness with nature and environmental identity are assessed with questionnaire items and is lower when connectedness with nature is assessed graphically.

# CHAPTER 3

## The Relationship Between People's Environmental Considerations and Pro-environmental Behavior in Lithuania

Chapter 3 is built on the following publication: Balundė, A., Perlaviciute, G., & Steg, L. (2019). The relationship between people's environmental considerations and pro-environmental behavior in Lithuania. Frontiers in Psychology, 10, 2319. https://doi.org/10.3389/fpsyg.2019.02319

## Abstract

Given the need for global action on climate change, it is crucial to comprehend which factors motivate people in different countries to act more pro-environmentally. Lithuania is a post-socialist country that has recently increased commitment to foster pro-environmental behavior of individuals, by implementing interventions that target mainly the personal costs and benefits of relevant behaviors. Yet, research suggests that people's general environmental considerations, namely biospheric values and environmental self-identity, can drive people' pro-environmental behavior and may be important targets for interventions. These studies, however, have been mostly conducted in Western Europe and the United States, with limited evidence of relationship between people's biospheric values, environmental self-identity and pro-environmental behaviors across different countries and cultures. We performed a correlational study with a convenience sample in Lithuania ($N$ = 334). Consistent with previous studies and the theory, our study revealed that people's general environmental considerations were positively related with recycling and environmental activism, but not with fuel-efficient driving and the use of sustainable transportation in Lithuania. We conclude that general environmental considerations are related to pro-environmental behaviors beyond Western Europe and the United States. Yet, future studies need to examine the boundary conditions of this relationship and test whether interventions targeting environmental consideration can be effective to promote pro-environmental behavior.

## 3.1 Introduction

Anthropogenic causes of environmental problems such as climate change have been widely acknowledged (IPCC, 2018; Stern et al., 2016). Environmental problems could therefore be reduced if people acted more pro-environmentally. Many countries have already committed to take measures to reduce climate change (United Nations Climate Change, 2015), yet the efficiency of implementation and scale of these measures differs across countries (IPCC, 2018). Such measures will be more effective if they address key antecedents of pro-environmental actions of citizens of these different countries (Steg & Gifford, 2017). To this end, the question is which factors are related to pro-environmental behavior across different countries and cultures (Mancha & Yoder, 2015; Morren & Grinstein, 2016). Such knowledge is crucial for developing effective measures to promote pro-environmental behavior in countries across the world (Intergovernmental Panel on Climate Change (IPCC), 2018; Steg et al., 2014).

Research shows that people's environmental considerations, such as biospheric values and environmental self-identity, are related to pro-environmental behavior. Pro-environmental behavior can be defined as all possible actions aimed at avoiding harm to and/or safeguarding the environment (Steg & Vlek, 2009), either performed in public (e.g., participation in environmental movements) or private domains (e.g., recycling; Hadler & Haller, 2011). Values have been found to be an important antecedent of a variety of pro-environmental behaviors (Abrahamse & Steg, 2013; Nordlund & Garvill, 2003; Steg et al., 2014, 2015). Four types of values have been shown to be particularly important in explaining pro-environmental behavior, namely biospheric values (caring about nature and environment protection), altruistic values (focusing on the well-being of others), egoistic values (safeguarding and promoting personal resources), and hedonic values (focusing on seeking pleasure and reducing effort) (de Groot et al., 2012; Steg et al., 2014). Pro-environmental behaviors often imply personal costs, while the benefits are mostly for the environment and society at large. This explains why, compared to other values, particularly people's biospheric values are positively and strongly related to pro-environmental behavior (Nordlund & Garvill, 2003; Steg et al., 2011, 2014). Biospheric values motivate people to act pro-environmentally, even when the behavior is somewhat costly (Loebnitz & Aschemann-Witzel, 2016; Steg, 2016; Steg et al.,

2014; Verplanken & Holland, 2002). For example, the more individuals endorse their biospheric values, the more they recycle and drive in an energy-efficient manner (van der Werff et al., 2014b), engage in environmental activism (Steg et al., 2011; Stern et al., 1999), eat less meat and take shorter showers (Steg et al., 2012; Thøgersen & Ölander, 2002), intend to reduce car use and accept car use reduction policies (de Groot & Steg, 2007a), accept energy policies aimed at reducing household $CO_2$ emissions (Steg et al., 2011), and adopt renewable energy systems at home (van der Werff & Steg, 2016).

Biospheric values represent general goal to protect the environment, which is why they are related to many different pro-environmental behaviors. Yet, it also implies that they are related to behaviors mostly indirectly (Dietz, 2015; Steg et al., 2014). An important factor that could explain the relationship between biospheric values and pro-environmental behavior is environmental self-identity (van der Werff et al., 2013b). Environmental self-identity reflects the degree to which a person thinks of himself or herself as an individual who acts in environmentally friendly manner (van der Werff et al., 2013a). People are motivated to act in line with how they see themselves in order to be or appear to be consistent (Bem, 1972). The stronger their environmental self-identity, the more individuals tend to recycle (Mannetti et al., 2004; Whitmarsh & O'Neill, 2010), use sustainable transportation and drive fuel-efficiently (van der Werff et al., 2013b), engage in environmental activism (Fielding et al., 2008), intend to consume less meat (van der Werff et al., 2013b), and prefer environmentally friendly products (Barbarossa & De Pelsmacker, 2016; van der Werff et al., 2014b).

So far, biospheric values and environmental self-identity have mostly been studied separately. Yet, building on the above, a theoretical model has been introduced, which postulates that environmental self-identity mediates the relationship between biospheric values and pro-environmental behaviors (Figure 1; van der Werff et al., 2014b). A few studies have tested the full model of relationship between biospheric values, environmental self-identity and pro-environmental behavior, providing initial empirical support for the model, including evidence for the proposed mediation effect, via correlational as well as experimental designs (Gatersleben et al., 2014; van der Werff et al., 2013b, 2014b; van der Werff & Steg, 2016).

**Figure 1** Theoretical Model on the Relationship Between Biospheric Values, Environmental Self-Identity and Pro-Environmental Behavior (adopted from van der Werff et al., 2014b)




Importantly, these studies have been carried out exclusively in Western European countries with relatively long history of policies and measures aimed at promoting individual pro-environmental behavior. This raises a question whether similar relationship between these key variables can be found in other countries, which are not so-called WEIRD countries (Western, Educated, Industrialized, Rich and Developed; Henrich et al., 2010) and which are only starting to develop and implement policies and measures to promote individual pro-environmental behavior.

Some initial evidence from non-Western countries supports parts of the relationships proposed in the theoretical model (Figure 1). For example, in Latin America, notably Argentina, biospheric values were related to household energy savings (Jakovcevic & Reyna, 2017), and intention to reduce passenger car use and acceptability of passenger car taxation policies (Jakovcevic & Steg, 2013). In addition, biospheric values were related to energy conservation behavior in Hungary (de Groot et al., 2012) and Turkey (Sahin, 2013), and acceptability of car use reduction policies in Japan and Russia (Hiratsuka et al., 2018; Ünal et al., 2019). These studies however did not include environmental self-identity. One study found that identifying oneself as an environmentally friendly consumer mediated the effects of biospheric values on intentions to buy energy-efficient appliances in Vietnam (Nguyen et al., 2016). However, seeing oneself as an environmentally friendly consumer is a very specific measure that is less likely to be related to a variety of pro-environmental behaviors than a more general measure of environmental self-identity. To conclude, the proposed relationship in the literature between biospheric values, environmental self-identity, and different pro-environmental behaviors (Figure 1; van der Werff et al., 2014b) has not been studied outside affluent Western Europe; the current study addresses

this gap in the literature by testing above mentioned relationship in different country, namely Lithuania.

Lithuania is a post-socialist country and relatively young member of the European Union (EU) that differs in many respects from the Western EU and from countries where previous studies on the relationship between biospheric values, environmental self-identity and environmental behaviors have been conducted. After gaining its independence in 1990, Lithuania went through radical changes of the economic system: from state-run to market-oriented. It also encountered challenges while reestablishing its national identity. Since joining the European Union and NATO in 2004 Lithuania demonstrated a quick development and growth of economy. Being a part of these internationally acknowledged alliances' including OECD indicates that Lithuania's economic performance approaches that of developed countries. Yet, despite economical advancements, Lithuania encounters issues that are not common to Western societies, especially the so-called WEIRD countries (Henrich et al., 2010). These issues include high rates of people living at risk of poverty and social exclusion (Eurostat, 2017b), one of the lowest income among EU countries (Eurostat, 2019), large development gaps between large cities and areas beyond them (Pociūtė-Sereikienė, 2019), high rates of unemployment in rural areas, high emigration rates and drain of the intellectual capital that flows to Western countries (Ubarevičienė & van Ham, 2017). What is even more relevant in the context of the current study, is that Lithuanians do not recognize climate change as important, particularly compared to citizens of affluent countries such as Sweden, Finland, Denmark, Ireland, Belgium, France and the Netherlands (Eurobarometer, 2018). Furthermore, unlike in Western European countries, the so-called post-materialist values (Inglehart, 2018) are not dominant in Lithuanian society; on the contrary, with the slight fluctuations, materialist values became increasingly more expressed from 1990 to 2008 (Savicka, 2016), during the period of economic growth. Although the latest data shows consistent slow decrease in materialist values and increase of post-materialist values in Lithuania, materialist values remain dominant (Inglehart, 2018). Materialist values can indeed inhibit pro-environmental actions (Wang et al., 2019), therefore, the question is whether there is a relationship between environmental considerations and pro-environmental behavior in Lithuania.

One could speculate that in a country with such prominent other issues besides the environment, environmental considerations are not strongly related to concrete pro-environmental behaviors. If anything, Lithuanians may link pro-environmental behaviors primarily to immediate practical concerns, such as costs and convenience. This assumption seems to be entrenched in policies and measures aimed at promoting pro-environmental behaviors in Lithuania. These measures have mostly aimed at making pro-environmental behavior beneficial and making the environmentally harmful behavior costly, thus focusing exclusively on reducing individual costs and increasing individual benefits of pro-environmental behavior. Examples include infrastructure developments and technological improvements (e.g., building cycling paths, improving public transportation facilities, improving and establishing new recycling facilities, and implementing cleaner technologies in industry, among others; European Environment Agency, 2015) as well as financial incentives (e.g., deposits for recycled bottles and cans, taxes for commercial motor vehicles, and a free parking service for users of electric vehicles; Packaging and Packaging Waste Processing Law, 2001). Notably, such measures typically do not address general environmental considerations to motivate people to engage in the relevant actions. While there have been some informational campaigns that target people's awareness of environmental problems (Environmental Sector Publicity Measures, 2014), such campaigns typically do not inform people about which individual actions could contribute to resolving these issues. Alternatively, one could also expect that biospheric values and environmental self-identity are universal general factors that are related to environmental behavior across countries and cultures, therefore environmental considerations will be related to environmental behavior in Lithuania. Since both cases are likely, it is very relevant to study whether and to what extent the relationship between biospheric values, environmental self-identity, and pro-environmental behaviors exists in Lithuania.

We study the relationship between biospheric values, environmental self-identity, and several pro-environmental behaviors, which we consider highly relevant in Lithuania, namely recycling, environmental activism, and transportation behaviors, specifically fuel-efficient driving and the use of sustainable transportation. Notably, although the amount of recycled waste in

Lithuania increased from 2% in 2004 to 30% in 2014, probably largely due to improved recycling facilities, it remains below the EU target to recycle 50% of waste in 2020 (European Environment Agency, 2017). Next, Lithuania is behind most of the EU countries in the use of public transportation, with 89.2% of citizens commuting by car (Eurostat, 2017a). This is noteworthy, since 25.4% of greenhouse gas emissions in Lithuania are caused by the transportation sector (LME & EPA, 2017). Finally, environmental activism is interesting because it had favorable conditions to occur in Lithuania. In 2016 (when this study was conducted) a critical mass of NGOs' was formed in Lithuania. These NGO's aim to educate society about environmental issues and promote citizens' environmental activism. This has been done mainly through informational campaigns [e.g., raising awareness on environmental issues such as climate change via public service announcements (PSAs'), educational campaigns (e.g., "Green Olympics") and public events (e.g., creative recreational activities such as festivals in nature in protected areas) (Kriauciunaite & Telesiene, 2009). Although fragmentally and mostly on a small scale, NGOs' have therefore been targeting people's environmental considerations to promote pro-environmental behavior, and environmental activism in particular. Yet, the question remains whether or not environmental considerations are related to pro-environmental behaviors in Lithuania, which represents post-socialist countries that are only starting to promote pro-environmental behavior.

## 3.2 Materials and Methods

### 3.2.1 Participants and Procedure

The data was collected in April–July 2016 in Lithuania, using a convenience sampling method. Most of the participants completed online questionnaires disseminated through social networks Facebook and Google+, additionally asking the participants to forward the link to the questionnaire to as many people as possible. In total 266 people completed the questionnaire (79.6% of the total sample; the response rate is not known as we did not track to how many contacts the participants forwarded the questionnaire). Besides, we approached students at a local university during psychology lectures and asked them to complete a paper version of the questionnaire (8.1% of the sample; *n*

= 27; response rate: 90%). The rest of the participants were recruited by asking acquaintances of the first author to fill in a paper version of the questionnaire (12.3% of the sample; $n$ = 41; response rate: 41%). Participants' confidentiality and possibility to withdraw from the study at any stage were assured.

First, participants' values were measured and afterward their pro-environmental behaviors and environmental self-identity.[15] Additionally, questions about demographic characteristics were included at the end of the questionnaire. Eight participants did not complete a substantial part of the questionnaire and their data were excluded from the analysis, therefore the final sample consisted of 334 responses. In total 65 men and 266 women participated in the study; three participants did not specify their gender. The age of participants ranged from 18 to 73 ($M_{age}$ = 34.28, $SD_{age}$ = 12.28). In total 76.3% of the participants had obtained higher education, 22.8% had vocational or lower education, and 0.9% did not specify their education level. Income distribution was as follows: 21.9% had a monthly personal income of ≤300 €, 36.5% had a monthly personal income of ≤600 €, 17.1% had a monthly personal income of ≤800 €, 6.6% had a monthly personal income of ≤1000 €, 15.2% had a monthly personal income of >1000 €, and 3.3% participants did not specify their income.

A priori power analysis (Soper, 2017) revealed that $n$ = 161 is the minimum and $n$ = 227 is the recommended sample size to conduct a valid SEM analysis to test the model (when effect size is .30, statistical power is .80, level of significance is .05, with six latent variables and 17 observed variables). The sample size of this study, $n$ = 334, was therefore sufficient.

### 3.2.2 Ethics Statement

This research was conducted in accordance with the recommendations of and approved by the Psychological Research Ethics Committee of the Mykolas Romeris University. Informed consent was obtained from study participants; it was considered that by filling in the survey participants gave their consent to participate. Anonymity of participants was assured. Study participants

15 The current research was part of a larger survey on pro-environmental behavior in Lithuania. We only discuss measures that are directly relevant to this study; other measures are available from the first author upon request.

were informed that their participation is voluntary, and that they can refuse to participate or withdraw from the study at any stage. Participants were also informed about the aims of the study and that the data will be used for scientific purposes only. Participation in the online and paper surveys was anonymous; no data was collected that can be linked to the participants' identity.

## 3.3 Measures

We used established instruments to measure the key variables of interest, which we translated into Lithuanian. Translation and back-translation procedures were performed.[16] For all measures that consisted of three or more items, we used Cronbach's alpha to assess scale reliability. For measurements consisting of two items, we calculated correlation coefficients. All scales included in the study were reliable.

### 3.3.1 Values

A short version of the Schwartz's values scale (Schwartz, 1992, 1994) developed by de Groot and Steg (2007) and Steg and colleagues (2012) was used to measure people's values. Instrument was tested and validated in numerous studies (e.g., Steg et al., 2012). Participants indicated on a nine-point scale to what extent they find different values important as guiding principles of their life. A scale ranged from –1 *opposed to my guiding principles*, 0 *not important*, to 7 *of supreme importance*. The scale included four items that measure biospheric values (e.g., "Respecting the earth: harmony with other species"; $\alpha = .89$). Higher scores mean stronger endorsement of biospheric values.

We used the Oblique Multiple Group (OMG) method to test whether the data supports the a priori assignment of the value items to the four value

16 First, a Lithuanian native speaker, who is an English linguist-translator, translated the original scales from English to Lithuanian. Afterward, a second English linguist-translator back-translated the Lithuanian version to English. Next, the first author and another researcher in Psychology (both native Lithuanian speakers) translated the English version into Lithuanian. Finally, the first author, the second researcher in Psychology, and an expert in Lithuanian language checked for inconsistencies between the different translated versions and made corrections where necessary.

dimensions (Stuive et al., 2008), a method that is commonly used to test whether the four types of values can be distinguished empirically (e.g., Steg et al., 2012). The analysis confirmed the distinction of biospheric values from altruistic, egoistic, and hedonic values. Notably, the items that are theoretically meant to measure biospheric values indeed correlated stronger with the biospheric values scale than with the other value scales, when controlled for self-correlations (Table 1).[17]



17 The item measuring altruistic values, namely "A world at peace," correlated more strongly with the biospheric values scale and two items measuring egoistic values, namely "Ambitious" and "Wealth" correlated more strongly with the altruistic and hedonic values scales, respectively (see Table 1). Given that we focus in this study on particularly biospheric values and that the items measuring biospheric values formed a reliable scale, we decided to comply with the theoretically and empirically established structure of the instrument. Interestingly, studies in some other post-socialist counties, namely Czechia (de Groot & Steg, 2007a) and Hungary (de Groot et al., 2012), also found that "A world at peace" correlates most strongly with the biospheric values scale. This could indicate that this value represents more biospheric than altruistic values in post-socialist countries. The studies in these countries also found a relatively strong positive correlation between "Ambitious" and the altruistic values scale. Materialism values dominate in comparison to post-materialism values in these countries, as in Lithuania (Inglehart, 2018). People in these countries value materialistic well-being and hard work (Inglehart, 2018) and may therefore perceive being ambitious, hardworking and aspiring as key qualities for the well-being of the society. These explanations are highly speculative, however, and required further examination. The positive correlation between "Wealth" and the hedonic values scale is likely since both types of values belong to the same dimension of self-enhancement values (Schwartz, 1992, 1994).

**Table 1** Correlations Between the Value Items and the Corresponding Value Scales

| Scale | Biospheric values | Altruistic values | Egoistic values | Hedonic values |
|---|---|---|---|---|
| Biospheric values | | | | |
| Respecting the earth | **.663** | .372 | -.017 | .054 |
| Unity with nature | **.647** | .279 | .055 | .076 |
| Protecting the environment | **.726** | .361 | .097 | .167 |
| Preventing pollution | **.710** | .357 | .059 | .103 |
| Altruistic values | | | | |
| Equality | .276 | **.280** | .093 | .204 |
| A world at peace | **.442** | .239 | .089 | .211 |
| Social justice | .355 | **.360** | .116 | .092 |
| Helpful | .297 | **.329** | .175 | .045 |
| Egoistic values | | | | |
| Social power | -.012 | .074 | **.383** | .242 |
| Wealth | -.028 | .016 | .314 | **.487** |
| Authority | -.052 | .013 | **.444** | .348 |
| Influential | .103 | .180 | **.358** | .282 |
| Ambitious | .233 | **.307** | .206 | .259 |
| Hedonic values | | | | |
| Pleasure | .124 | .135 | .327 | **.586** |
| Enjoying life | .012 | .091 | .313 | **.532** |
| Self-indulgent | .164 | .188 | .330 | **.590** |

*Note.* Correlation coefficients are corrected for self-correlation and test-length. The highest correlation coefficients of each item, are marked in bold. The tested item grouping explains 62.43% of the observed variance.

### 3.3.2 Pro-Environmental Behavior

To measure pro-environmental behaviors, we used items from the General Ecological Behavior instrument (Kaiser & Wilson, 2004). Participants rated the frequency of their engagement in each of the behaviors on a Likert type scale, varying from 1 *never* to 5 *very often*. Two items measured recycling behavior: "I collect and recycle used paper" and "I bring empty bottles to a recycling bin" ($r$ = .46, $p < .01$); three items measured environmental activism: "I boycott companies

with an unecological background", "I read about environmental issues", and "I talk with my friends about environmental pollution, climate change, and/or energy consumption" ($\alpha$ = .75); two items measured fuel-efficient driving: "I keep the engine running while waiting in front of a railroad crossing or in a traffic jam" and "At red traffic lights, I keep the engine running" (scores were reverse-coded; higher scores mean more fuel-efficient driving; $r$ = .49, $p$ < .001); and three items measured the use of sustainable transportation modes: "I ride a bicycle or take public transportation to work or school", "I drive my car to the city" (reverse coded), and "In nearby areas (around 30 kilometers), I use public transportation or ride a bike" ($\alpha$ = .87).

### 3.3.3 Environmental Self-Identity

A validated instrument was used to measure individuals' environmental self-identity (van der Werff et al., 2013a, 2013b). Participants indicated on a Likert type scale, varying from 1 *totally disagree* to 7 *totally agree* to what extent they consider themselves as individuals who act in an environmentally friendly way (e.g., "Acting pro-environmentally in an important part of who I am"; $\alpha$ = .81). Higher scores reflect a stronger environmental self-identity.

## 3.4 Results

### 3.4.1 Data Analysis Strategy

The statistical software SPSS 23.0 and Mplus 7.4 (Muthén & Muthén, 2017) were used for the data analyses. To test the relationship between key variables we followed statistical procedures that are commonly applied to test the theoretical model (Gatersleben et al., 2014; van der Werff et al., 2013b, 2014b; van der Werff & Steg, 2016). We first studied bivariate correlations to examine the relationships between the key variables. Next, to examine the relationship between the environmental considerations and the four pro-environmental behaviors as proposed by the theoretical model (Figure 1), we used Structural Equation Modeling (SEM) with a maximum likelihood estimator (ML) that, treats biospheric values and environmental self-identity as predictors of the four types of pro-environmental behaviors, and environmental self-identity as a mediating variable in the relationship between biospheric values and the

different behaviors.[18]

### 3.4.2 Relationship Between People's Biospheric Values, Environmental Self-Identity and Pro-environmental Behavior

Bivariate correlations between all variables measured in this study (as well as means and standard deviations) are provided in Table 2. We further discuss specifically the relationships that are relevant for the current research questions. Biospheric values and environmental self-identity correlated positively with all pro-environmental behaviors, except for the use of sustainable transportation modes. Biospheric values and environmental self-identity were also correlated positively and strongly.[19]

The model[20] of the relationship between environmental considerations and pro-environmental behaviors (Figure 1) fitted the data sufficiently well ($\chi 2 = 217.72$, $p < .01$, $df = 104$, $CFI = .95$, $TLI = .94$, $RMSEA$ [90% CI] = .06 [.05;.07], $SRMR = .05$) and could be considered as acceptable (Little, 2013).[21] The results are illustrated in Table 3.

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18 Please note that because of the correlational nature of the data, we cannot draw firm conclusions on causal relationships. We thank reviewer for bringing this important point forward.

19 Oblique Multiple Group (OMG) analysis indicated that items measuring biospheric values and environmental self-identity correlate strongly with the respective scales. One item measuring environmental self-identity ("Acting environmentally friendly is an important part of who I am") also correlated strongly with the biospheric values scale ($r = .55$), as well as with the environmental self-identity scale ($r = .54$); please see OSF repository https://osf.io/qn9fp/?view_only=055ffd0809454c0ba6bd2f2597097c08.

20 We controlled for the possible differences in the tested model across the data collected in two different ways: online versus paper questionnaire. The invariance analysis with Mplus 7.4 (Muthén & Muthén, 2017) was performed. We found no significant differences in the model fit (Milfont & Fischer, 2010). We additionally tested gender effects on the studied model of relationship and found no significant differences in the tested model based on gender.

21 The value of *TLI* was slightly below the suggested threshold (.95; Schreiber et al., 2006), yet it is still acceptable and does not deviate much from the acceptable values (Hooper et al., 2008; Little, 2013).

**Table 2** Bivariate Correlations Between Values, Environmental Self-Identity, Pro-Environmental Behaviors and Demographic Characteristics

| | *M/(SD)* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Biospheric values | 5.58(1.34) | - | | | | | | | | | | | |
| 2. Altruistic values | 5.60(1.08) | .55*** | - | | | | | | | | | | |
| 3. Hedonic values | 5.05(1.52) | .13* | .23*** | - | | | | | | | | | |
| 4. Egoistic values | 3.13(1.59) | .003 | .14* | .52*** | - | | | | | | | | |
| 5. Environmental self-identity | 5.25(1.12) | .62*** | .42*** | -.05 | -.01 | - | | | | | | | |
| 6. Recycling | 3.90(1.12) | .23*** | .08 | -.19*** | -.10 | .33*** | - | | | | | | |
| 7. Environmental activism | 2.48(0.92) | .43*** | .23*** | -.11* | -.12* | .47*** | .35*** | - | | | | | |
| 8. Sustainable transportation use | 3.00(1.40) | -.04 | -.02 | -.08 | -.14* | -.02 | .07 | .01 | - | | | | |
| 9. Fuel-efficient driving | 2.25(1.16) | .18** | .002 | -.06 | -.04 | .18** | .06 | .22*** | .26*** | - | | | |
| 10. Gender | | .05 | .09 | -.02 | -.05 | .13* | .14* | .13* | .08 | -.10 | - | | |
| 11. Age | 34.29(12.29) | .29*** | .10 | -.18** | .01 | .38*** | .28*** | .32*** | -.18** | .19** | .02 | - | |
| 12. Education | | .07 | -.02 | -.09 | .02 | .13* | .17** | .20*** | -.10 | -.08 | .03 | .41*** | - |
| 13. Income | | .09 | -.04 | .03 | .07 | .06 | .08 | .03 | -.21*** | -.03 | -.17** | .17** | .29*** |

*Note.* * $p < .05$, ** $p < .01$, *** $p < .001$.

**Table 3** Relationship Between Biospheric Values and Pro-Environmental Behaviors, Mediated by Environmental Self-Identity

| Indirect and direct paths | Estimate [95% BC CI] | *SE* |
|---|---|---|
| Indirect effect of BIOS on REC via ESI | .34** [.12; .55] | .11 |
| Direct effect of BIOS on REC | -.01 [-.26; 25] | .13 |
| Indirect effect of BIOS on EA via ESI | .29** [.08; .50] | .11 |
| Direct effect of BIOS on EA | .22 [-.01; .45] | .12 |
| Indirect effect of BIOS on FED via ESI | .16 [-.04; 35} | .10 |
| Direct effect of BIOS on FED | .06 [-.21; .34] | .14 |
| Indirect effect of BIOS on STM via ESI | .03 [-.12; .19] | .08 |
| Direct effect of BIOS on STM | -.10 [-.31; .12] | .11 |

*Note.* $**p < .01$. Estimate – standardized estimates; *SE* – standard error; *BC CI* – bias-corrected confidence intervals. BIOS – biospheric values; ESI – environmental self-identity; REC – recycling; EA – environmental activism; FED – fuel-efficient driving; STM – the use of sustainable transportation modes.

In line with the theoretical model, we found that biospheric values were related to environmental self-identity ($\beta = .69$, $p < .01$). Biospheric values had no direct positive relationship with the studied behaviors when environmental self-identity was included as a mediator. We found significant indirect relationship between biospheric values and environmental activism as well as recycling via environmental self-identity, but no relationship was found between biospheric values and fuel-efficient driving and the use of sustainable transportation modes via environmental self-identity (Table 3).

Environmental self-identity explained 23% of variance in recycling behavior, while biospheric values, when including environmental self-identity as a mediator, explained 10% of variance in recycling. Environmental self-identity

explained 35% of variance in environmental activism, while biospheric values, when including environmental self-identity as a mediator, explained 17% of variance in environmental activism.

## 3.5 Discussion



Given the global urgency to combat climate change, it is highly relevant to investigate general factors that relate to various pro-environmental behavior across different countries and cultures. This is particularly important for countries where interventions to promote pro-environmental behavior are only starting to enter political agendas and where there has been little research into factors related to pro-environmental behaviors. We studied the relationship between general environmental considerations, namely biospheric values and environmental self-identity, and pro-environmental behaviors in Lithuania, a post-socialist and non-WEIRD country.

We found that biospheric values and environmental self-identity were strongly correlated with each other and related to some types of pro-environmental behaviors in Lithuania, namely recycling and environmental activism. This provides further support for the relationship between these key variables, as theorized and initially supported in past studies (Gatersleben et al., 2014; van der Werff et al., 2013b, 2014b; van der Werff & Steg, 2016), and gives first evidence that this relationship can hold in countries outside affluent Western-Europe. Together with studies that have tested parts of this theoretical model in other parts of the world, the current findings give evidence that also in countries outside Western-Europe and the United States, stronger general environmental considerations are associated with concrete pro-environmental behaviors (de Groot et al., 2012; Geiger et al., 2019; Hiratsuka et al., 2018; Jakovcevic & Reyna, 2017; Jakovcevic & Steg, 2013; Nguyen et al., 2016; Sahin, 2013).

While biospheric values and environmental self-identity were positively related with recycling and environmental activism, both variables were not significantly related with fuel-efficient driving and the use of sustainable transportation modes. This could be due to various reasons. First, using sustainable transportation modes may be perceived as a personally costly behavior in

Lithuania, and it seems that environmental considerations are poorer predictors of relatively costly behaviors (Gatersleben et al., 2014; Whitmarsh & O'Neill, 2010). Using sustainable transportation modes in Lithuania can be inconvenient and time-consuming, for example because of outdated vehicles (e.g., buses) and absence of conditioning/heating systems in public transport. Cycling infrastructure in Lithuania is still underdeveloped, which makes cycling not easy and often even not safe. The relatively high personal costs of sustainable transportation behaviors in Lithuania could prevent people from engaging in these behaviors, even if they have strong biospheric values and a strong environmental self-identity. Future studies could examine whether and how perceived costs, as well as perceived benefits, of different pro-environmental behaviors affect the relationship between people's environmental considerations and engagement in these behaviors. Second, especially for fuel-efficient driving, such as stopping the car engine when waiting at a traffic light, people may have never considered the environmental impact of such behavior, partly because such behaviors are never presented in interventions as having impact on the environment. Hence people may not take their environmental considerations into account in such behavioral choices. Future studies need to test the degree to which people are aware of the environmental impact of different behaviors and how that affects the relationship between their environmental considerations and engagement in these behaviors.

Building on the current findings, the next critical step is to test the effects of interventions that target people's environmental considerations on pro-environmental behaviors. This is especially important in less affluent countries with limited budgets for environment interventions and in countries where practices fostering pro-environmental behavior are just starting. These countries are in need of evidence-based knowledge that could inform effective and efficient policies and measures to meet the climate goals. Our study gives initial evidence that general environmental considerations are related with specific pro-environmental behaviors in Lithuania, which is an important starting point to develop and test interventions that target environmental considerations. While interventions that make pro-environmental behaviors less costly are important, because they reduce barriers to the behavior, it may also be important at the same time to target environmental considerations in such interventions, explicitly linking these interventions to environmental

considerations (van der Werff et al., 2013a, 2013b; van der Werff & Steg, 2016). For example, interventions could aim at strengthening individuals' environmental self-identity (Fanghella et al., 2019) by reminding people of their pro-environmental behavior performed in the past, which has been found to reinforce their environmental self-identity, eventually resulting in other environmentally beneficial actions (van der Werff et al., 2014a). The effectiveness of such interventions could be tested via experimental and/or field studies, more specifically it could be tested which interventions are effective in strengthening environmental self-identity and whether they indeed result in more pro-environmental behavior.

A few concerns regarding this study should be considered when interpreting the results. We used a convenience sample, which included more females and higher levels of education and income compared to the general population in Lithuania. Yet, the goal of the current research was to test the relationship between people's environmental considerations and pro-environmental behaviors. While the absolute values of these variables could potentially differ across different demographic groups, we do not have a reason to expect that this would change the relationship between these variables (see also Bhushan et al., 2019; de Groot et al., 2012; de Groot & Steg, 2007a; Schultz et al., 2005). We indeed found no effects of gender on the relationship between people's environmental considerations and pro-environmental behaviors, and the relationship remained the same irrespective of the method of the data collection. Furthermore, our sample is likely to be comparable to the general population in terms of exposure to and experience with interventions aimed at promoting pro-environmental behavior in Lithuania. Future studies could explore whether the findings of this research could be replicable in a more representative sample.

Next, we used self-reported measures of environmental behavior. Future studies could examine whether similar results will be found when including measures of actual behaviors, for example by weighing recycled materials of households (Bartelings & Sterner, 1999), reaching out to individuals who actually are (not) members of environmental organizations and/or studying people's voting behaviors and donations to environmental organizations (Alisat & Riemer, 2015), using driving simulator for measuring fuel-efficient driving (Dogan et al., 2011; Zhao et al., 2015), and employing GPS technologies

to trace daily transportation patterns (Bolderdijk & Steg, 2011; Houston et al., 2014), among others.

Further, the relationship between biospheric values and environmental self-identity was rather strong that could lead one to concerns regarding their discriminant validity. Strong relationship between the two constructs can be expected based on theory (e.g., Bardi et al., 2014; Hitlin, 2003; Schwartz, 1992; Verplanken & Holland, 2002). At the same time, the two constructs have been distinguished on theoretical grounds (van der Werff et al., 2013b, 2014b; Whitmarsh & O'Neill, 2010), and studies conducted in six different samples confirmed that they can be empirically distinguished (van der Werff et al., 2013b, 2014b). Yet it is important for future research to test whether the current findings regarding this strong correlation can be replicated in Lithuania and if so whether the two constructs can be empirically distinguished in Lithuania as it was done in other countries (van der Werff et al., 2013b, 2014b). Future research is also needed to find out what could cause some overlap between the two constructs in Lithuania.

Also, the variables of the current study were distributed on the right side from the zero (except egoistic and hedonic values that are deviated to the right side to a lesser extent). As suggests literature such deviation could yield stronger correlations than they actually are (Podasakoff et al., 2003). Yet in the current study, we found significant relationship between the environmental considerations and pro-environmental behaviors, but not for all of them. This indicates that probably relationships were not affected by certain biases that strong, because some relationships were non-significant. Rather, this points out that there may be important reasons why environmental considerations relate to some behaviors and not to others (e.g., high behavioral costs). Future studies could test whether similar results can be found when questionnaire order effects are reduced, for example, by randomizing instruments' items (Podasakoff et al., 2003) and measuring key variables in different time points (e. g., van der Werff et al., 2013b, 2014b).

Finally, based on the correlational study, we cannot draw conclusions about the causal relationship between people's environmental considerations and pro-environmental behavior. Yet, there is initial evidence from prior research on the causal direction of the relationships for parts of the model. For example, a two-wave longitudinal study with a representative Danish sample concluded

that stronger universalism values, which incorporated biospheric values (e.g., protecting the environment) and altruistic values (e.g., social justice), predicted pro-environmental behavior (Thøgersen & Ölander, 2002). Specifically, a cross-lagged analysis indicated that values in the first measurement wave predicted pro-environmental behavior in the second wave, while behavior in the first wave had no effects on values in the second wave (Thøgersen & Ölander, 2002). Further, experimentally varying the levels of environmental self-identity in an experiment caused changes in people's choice for environmentally (un)friendly products (van der Werff et al., 2014b), which implies causality. Moreover, the causal relationship between values, identity and behavior have strong theoretical underpinnings (Schwartz, 1977; Stern, 2000). Yet, additional studies are still needed to establish causality in the full model of relationship between biospheric values, environmental self-identity and pro-environmental actions. Notably, the participants in our study first reported their pro-environmental behaviors and afterward environmental self-identity. It has been established that reminding individuals of their past pro-environmental behaviors could affect their environmental self-identity (van der Werff et al., 2014a, 2014b). Yet, since we found different relationship between the environmental considerations and some pro-environmental behaviors, but not for other pro-environmental behaviors, such order effects are not likely to have impacted on our results. Future studies could test the order effects further by counterbalancing the order of the items.

All in all, we find that also in a post-socialist non-WEIRD country general environmental considerations, namely biospheric values and environmental self-identity, are related to some pro-environmental behaviors. This is an important finding since current policies and interventions targeting pro-environmental behavior in Lithuania seem to rely on the assumption that pro-environmental behaviors are related to immediate, practical considerations only. With the current findings, we hope to provide impetus for future research to test the effects of interventions targeting environmental considerations on pro-environmental behavior in countries that have been understudied so far, such as Lithuania

# CHAPTER 4

## Sustainability in Youth: Environmental Considerations in Adolescence and Their Relationship to Pro-environmental Behavior

Chapter 4 is built on the following publication: Balundė, A., Perlaviciute, G., & Truskauskaitė-Kunevičienė, I. (2020). Sustainability in youth: Environmental considerations in adolescence and their relationship to pro-environmental behavior. *Frontiers in Psychology, 11*, 582920.
https://doi.org/10.3389/fpsyg.2020.582920

## Abstract

Adolescents today face the negative outcomes of climate change, and their pro-environmental behavior is crucial to mitigate these negative outcomes. Yet, we know little about what influences adolescents' pro-environmental behavior. Research shows that people's biospheric values and environmental self-identity, elicit personal norms to act environmentally friendly, which can induce a wide range of pro-environmental actions. Yet there is no evidence that these factors can influence pro-environmental behavior of adolescents, because this has only been studied for adults. Given that in adolescence, values, identities and moral structures undergo intense development, the question is whether these factors can motivate adolescents to act pro-environmentally. To address this question, we have conducted three studies with adolescents in Lithuania (Study 1: $N = 256$; Study 2: $N = 349$; Study 3: $N = 905$). We found support that adolescents' biospheric values and environmental self-identity were associated, via personal norms, with a wide range of pro-environmental behaviors, including recycling, environmentally friendly traveling, purchasing environmentally friendly goods and drinking tap water. Based on theory and the current findings, we suggest directions for policies aimed at promoting pro-environmental behavior of adolescents.

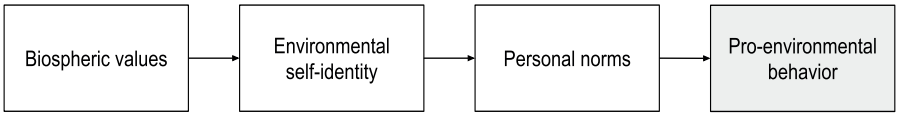
## 4.1 Introduction

Like no other generation, the youth today are exposed to grand environmental challenges (Faustini, 2014). Adolescents worldwide are rising and initiating social movements to urge policy makers to tackle environmental challenges such as climate change (e.g., Fridays for Future). This may signal that today's youth are concerned about the anthropogenic climate change and hold moral standards that motivate them to act pro-environmentally. But is this indeed the case?



The Value-Identity-Personal norm theoretical model suggests that people's general environmental considerations such as biospheric values strengthen environmental self-identity and elicit moral obligation to act environmentally friendly (Figure 1; Ruepert et al., 2016; van der Werff & Steg, 2016). Yet, this relationship has only been tested for adults and never for adolescents. Adolescents' values, identity and moral structures undergo intense development and are not stable yet (Moshman, 1999; Wigfield et al., 2006). This raises a question to what extent, if at all, adolescents hold personal norms to act pro-environmentally that are rooted in their biospheric values and environmental self-identity. Such knowledge is needed to develop evidence-based age-tailored policies to foster adolescents' pro-environmental behavior (United Nations General Assembly – UNGA, 2018).

**Figure 1** The Relationship Between Environmental Considerations and Behavior (adopted from van der Werff and Steg, 2016)




Pro-environmental behavior is aimed at protecting the environment or at least not harming it (F. Lange & Dewitte, 2019). Values are people's general goals or ideals in life that transcend situations and guide behavior (Schwartz, 1977, 1992). Four values have been found to be important to explain pro-environmental behavior, namely biospheric (caring for nature and the environment), altruistic (caring for other people), egoistic (caring for personal resources), and hedonic values (seeking pleasure and comfort; de Groot et al., 2012; de Groot & Steg,

2007a, 2007c; Steg et al., 2014). Biospheric and altruistic values are part of self-transcendence values (i.e., concern for the wellbeing of others), and egoistic and hedonic values are part of self-enhancement values (i.e., concern for personal interests and welfare; Schwartz, 2012b).

Particularly people's strong biospheric values have been found to be important to explain multiple pro-environmental behaviors (de Groot & Steg, 2007a, 2007c; Merrill et al., 2018; Steg et al., 2012, 2014). Studies found positive relationships between biospheric values and recycling and environmental activism (Balundė et al., 2019), energy conservation (de Groot et al., 2012; Sahin, 2013) and acceptability of policies to reduce car use (Hiratsuka et al., 2018; Ünal et al., 2019).

Because biospheric values reflect very general goals in life, they are related to behaviors mostly indirectly via intermediate factors, in particular environmental self-identity (van der Werff et al., 2014a). Environmental self-identity is the extent to which a person sees her/himself as someone who acts environmentally friendly (van der Werff et al., 2013b). The more people endorse biospheric values, the stronger is their environmental self-identity (van der Werff et al., 2014b). Together biospheric values and environmental self-identity can elicit people's personal norms to act pro-environmentally (van der Werff et al., 2013b, 2013a). Personal norms are internalized moral standards (Olkinuora, 1972; Schwartz, 1977), expressed as a sense of moral obligation to protect the environment (Steg et al., 2011). Personal norms to protect the environment are related to various pro-environmental actions, such as intentions to use green energy, preferences for sustainable products and willingness to reduce car use (Barbarossa & De Pelsmacker, 2016; Nordlund & Garvill, 2003; van der Werff et al., 2013a).

In sum, research suggests that people may hold moral obligations to act pro-environmentally, which are rooted in their biospheric values and environmental self-identity. These moral obligations in turn guide people's pro-environmental behavior (Figure 1; Ruepert et al., 2016; van der Werff & Steg, 2016). The full chain of relationships between biospheric values, environmental self-identity and personal norms has been demonstrated for pro-environmental behavior at work (Ruepert et al., 2016), participation in renewable energy projects (van der Werff & Steg, 2016) and tourists' pro-environmental behavior (Y. Xu et al., 2019).

However, these relationships have only been tested for adults so far, but never for adolescents. This is an important gap in the literature, because there is an urgent need for the youth of today to engage in many different sustainable behaviors. Therefore, it is critical to study general antecedents that influence adolescents' environmental behaviors, to effectively address the environmental crisis. Noteworthy, biospheric values and environmental self-identity in adolescence could potentially be fostered, for example, by means of environmental education (Caduto, 1983, 1985). Yet, to estimate whether such policies could be effective in promoting adolescents' pro-environmental behavior, it is crucial to study adolescents' biospheric values and environmental self-identity and their relationships with personal norms and the actual pro-environmental behavior.

Interestingly, pro-environmental behavior tends to decline from childhood to adolescence (Evans et al., 2007; Krettenauer, 2017; Krettenauer et al., 2019; Otto et al., 2019; Wray-Lake et al., 2017) and again increase in adulthood (Grønhøj & Thøgersen, 2009; Otto & Kaiser, 2014). Similarly, adolescents tend to see pro-environmental behavior as less obligatory then their younger counterparts (Krettenauer, 2017). This suggests that personal norms to act pro-environmentally and eventually pro-environmental behavior are not yet stable in adolescence. There is initial evidence that adolescents' pro-environmental behavior is related to their personal norms to act pro-environmentally (Collado, Staats, et al., 2017; Matthies et al., 2012; Uitto et al., 2015). Yet it has not been studied whether these norms and behaviors are rooted in adolescents' biospheric values and environmental self-identity.

Studies in various cultures have shown that universalism values, which encompass caring for nature and the environment as well as other people (Schwartz, 2012b), can already be detected in adolescents and distinguished from their other values (Cieciuch et al., 2013; Liem et al., 2010; Paez & De-Juanas, 2015; Schwartz et al., 2001; Schwartz, 2012a). At the same time, these values seem to be less prioritized in adolescence than later in life and weaker than other values, in particular self-enhancement values (Schwartz, 2012a; Vecchione et al., 2019). This suggests that biospheric values in particular may still be developing in adolescence. Furthermore, adolescents' identity structures are not stable yet as adolescents are still exploring their identities, including through social interactions with parents and peers (Crocetti et al.,

2008; Crocetti, 2017; Erikson, 1968; Kaplan & Garner, 2017; Klimstra et al., 2010; Luyckx et al., 2011; Meeus et al., 2010). Given that values, self-identity and moral standards of adolescents are still changing, we designed the study to test these key constructs in adolescence and their relationships with adolescents' pro-environmental behavior.

Importantly, acting sustainably requires a large variety of actions, from recycling to supporting environmental policy. Research suggests that specific constructs such as behavior-specific self-identity (e.g., "I see myself as someone who recycles) and personal norms (e.g., "I feel morally obliged to recycle") can predict the respective behavior (i.e., recycling; Geiger et al., 2019). Yet, it can be not very practical to look at only specific constructs, because of the wide range of behaviors that need to be promoted to address climate change. Values, on the other hand, are general constructs that could potentially predict a large variety of behaviors (Dietz, 2015). There is some initial evidence that environmental values influence many pro-environmental behaviors of adolescents, including cycling to school and other environmentally friendly everyday activities (Ojala, 2013). However, only the aggregate of the different behaviors was examined in this study, and not the effects of values on each individual behavior. Based on the compatibility principle (Ajzen, 1996; Trope & Liberman, 2010), one could argue that because values are measured on a general level, they particularly influence general categories of behaviors, but not concrete behaviors. To rule out this alternative explanation, we will test to what extent general environmental considerations, namely biospheric values and environmental self-identity, drive, via personal norms, various pro-environmental behaviors. We test this for behaviors at different levels of specificity – from general categories of behaviors to very specific actions.

The current research was designed to test the relationships between environmental self-identity, personal norms and pro-environmental behaviors in adolescence. We tested these relationships across three studies that targeted different pro-environmental behaviors, from general to specific. Specifically, we tested the relationships between adolescents' environmental considerations and more general behaviors such as recycling waste, choosing environmentally friendly transportation means and purchasing sustainably produced products (Study 1) and more specific behaviors, such as recycling non-refundable plastics, cycling to school, and purchasing organic food products

(Study 2) and drinking tap instead of bottled water (Study 3). In all three studies, we first tested whether biospheric values can be distinguished from other values (i.e., altruistic, egoistic and hedonic); and whether biospheric values, environmental self-identity and personal norms can be empirically distinguished from each other in adolescence sample. Then, we tested the extent to which biospheric values, environmental self-identity and personal norms can explain the different types of pro-environmental behaviors of adolescents.

If environmental considerations indeed guide general as well as specific pro-environmental behavior in adolescence, interventions could focus on, for example, strengthening biospheric values (e.g., through parents' and teachers' role modeling; environmental education). Adolescence could be an especially good time for such interventions, because environmental considerations in adolescence are still developing and may be more susceptible to change than in adulthood. As a result of behavior modeling or educational interventions, adolescents could have a stronger intrinsic motivation to act pro-environmentally and there may be less need for interventions based on financial (dis) incentives, laws and regulations. Also, adolescents' environmental considerations could be a gateway to many actions needed to combat climate change, such as changing traveling behavior and consumption habits, reducing energy use at home or at school, and recycling, among others (IPCC, 2018).

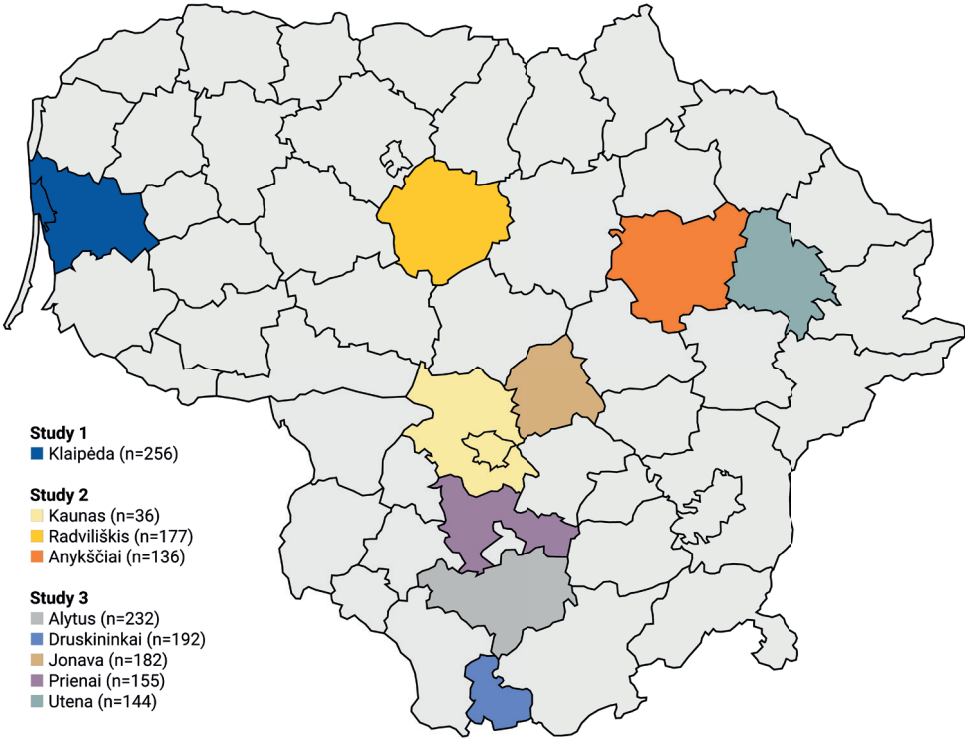


## 4.2 Materials and Methods

### 4.2.1 Participants and Procedure

The three studies were conducted in nine different municipalities of Lithuania covering different geographical regions, including urban and rural areas (Figure 2), enabling us to test the robustness of the findings. Participants completed online questionnaires at school, in computer labs, during a pre-scheduled meeting, using either desktops at school (Study 1) or tablets provided by the research team (Study 2 and 3). The survey time was strictly limited to avoid interference with participants' activities, such as classes or recess time.

**Figure 2** Geographical Representation of Regions Where Three Studies Were Conducted




Participants reported demographic characteristics (see Table 1), followed, in a random order, by measures of values, environmental self-identity, personal norms to act pro-environmentally and pro-environmental behavior. To cross validate our findings we used different scales to measure personal norms, namely one item measure and three-item instrument. Across each of three studies we tested different behaviors to uncover whether biospheric values, environmental self-identity and personal norms can explain a variety of pro-environmental behavior. All studies were part of a larger research project on adolescents' pro-environmental behavior. We only discuss the measures that were included for the purposes of the current studies.

**Table 1** Summary of Sample Characteristics

| Study | Year | Number of schools | Removed cases due to missing data | Refused to participate (n) | Response rate | Age | Gender | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Boys | Girls |
| Study 1 ($N$ = 256) | 2016 | 5 | - | 2 | 99.22% | 14 - 18 ($M$ = 15.33, $SD$ = .91) | 116 (45.3%) | 140 (54.7%) |
| Study 2 ($N$ = 349) | 2018 | 3 | 6 | 1 | 99.22% | 13 - 18 ($M$ = 16.07, $SD$ = .99) | 158 (45.3%) | 191 (54.7%) |
| Study 3 ($N$ = 905) | 2019 | 5 | 26 | 5 | 99.47% | 13 - 17 ($M$ = 15.23, $SD$ = .68) | 414 (45.7%) | 491 (54.3%) |

### 4.2.2 Measures

Participants' values were measured with a short version of the Schwartz's values instrument (de Groot & Steg, 2007a; Schwartz, 1992; Steg et al., 2012). Participants indicated on a nine-point scale to what extent different values are important guiding principles in their lives, from -1 *opposed to my guiding principles*, 0 *not important*, to 7 *of supreme importance*. Biospheric values scale consisted of four items, e.g., "Unity with nature: fitting into nature." We took the mean of these items to calculate biospheric values; higher values indicate stronger biospheric values (Study 1, $\alpha = .89$, $M = 4.42$, $SD = 1.84$; Study 2, $\alpha = .87$, $M = 4.35$, $SD = 1.86$; Study 3, $\alpha = .88$, $M = 5.12$, $SD = 1.70$). Confirmatory factor analyses in all three studies showed that biospheric values can be empirically distinguished from other values, namely altruistic, egoistic and hedonic values (Supplementary Material 1). Specifically, the items measuring biospheric values correlated stronger with the biospheric-values scale than with the other value scales, after controlling for self-correlations[23].

We used an established measure of environmental self-identity, which consists of three items (e.g., "I see myself as an environmentally friendly person"; van der Werff et al., 2013b, 2013a). Participants indicated to what extent they consider themselves as a person who acts pro-environmentally, from 1 – *totally disagree* to 5 – *totally agree*. We took the mean of these items to calculate environmental self-identity; higher values indicate stronger environmental self-identity (Study 1, $\alpha = .78$, $M = 3.33$, $SD = .84$; Study 2, $\alpha = .73$; $M = 3.60$, $SD = .64$; Study 3, $\alpha = .76$; $M = 3.52$, $SD = .71$).

An established instrument was used to measure personal norms (van der Werff et al., 2013a, 2013b). In Study 1 personal norms to engage in each behavior were measured with three items. Participants indicated on a five-point scale, from 1 – *totally disagree* to 5 – *totally agree*, to what extent they feel obliged to recycle (e.g., "I feel morally obliged to recycle waste"; $\alpha = .69$, $M = 3.39$, $SD = .84$), use sustainable transportation (e.g., "I feel morally obliged to choose environmentally friendly transportation means"; $\alpha = .76$, $M = 3.33$, $SD = .89$), and

23 For other values, a few items correlated slightly stronger with other value scales (see Supplementary Material 1). Supplementary materials for this paper, including dataset are available online: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.582920/full#supplementary-material

purchase sustainably produced goods (e.g., "I feel morally obliged to choose products that are produced in the least environmentally harmful way"; $\alpha = .73$, $M = 3.31$, $SD = .86$). In Study 2, due to the limited length of the questionnaire, we measured personal norms to engage in each behavior with single items, using the same five-point scale as in Study 1 (adapted from van der Werff et al., 2013a). Using single items is a valid way to measure personal norms (Schwartz, 1977), particularly when the item matches the definition of the construct, as is the case in this study. We tested to what extent participants feel obliged to recycle non-refundable plastics ("I feel morally obliged to recycle non-refundable plastics"; $M = 3.13$, $SD = 1.21$), cycle to school ("I feel morally obliged to cycle to school"; $M = 2.26$, $SD = 1.14$) and purchase organic food products ("I feel morally obliged to purchase organic food products"; $M = 2.70$, $SD = .98$). In Study 3, as in Study 1, we used three items to measure personal norms to engage in pro-environmental behavior. Participants indicated to what extent they feel obliged to not drink bottled water (e.g., "I feel morally obliged to not drink bottled water"; $\alpha = .77$, $M = 2.96$, $SD = .99$). In Study 1 and Study 3 we took the mean of these items to calculate personal norms; higher values indicate stronger personal norms to engage in each behavior.

Participants indicated on a five-point scale, from 1 – *never or almost never* to 5 – *always or almost always*, how often during the past two months they recycled waste ($M = 3.02$, $SD = 1.19$), chose environmentally friendly transportation means ($M = 3.12$, $SD = 1.14$) and chose products that are produced in the least environmentally harmful way ($M = 2.98$, $SD = 1.11$) in Study 1; how often during the period of the past four weeks they recycled non-refundable plastics ($M = 3.00$, $SD = 1.42$), cycled to school ($M = 1.67$, $SD = 1.15$) and purchased organic food products ($M = 2.68$, $SD = 1.01$) in Study 2; and how often during the period of the past four weeks they drank water from the tap or well ($M = 4.40$, $SD = .89$) in Study 3; higher values indicate stronger engagement in each behavior.

Confirmatory factor analysis indicated that in all three studies the items measuring biospheric values and environmental self-identity, also personal norms in Study 1 and Study 3, correlated stronger with their respective scales than with the other scales, after controlling for self-correlations (Supplementary Material 3). This suggests that biospheric values, environmental self-identity and personal norms discriminate well from each other. We did

not test the discriminant validity of personal norms in Study 2, because each personal norm was measured with single item.

No reversed coded items compose above indicated instruments. The full item list can be found in Open Science Framework repository: https://osf.io/yxfjz/?view_only=5bf95276c67a4984a8fb76cfe201abb7.

### 4.2.3 Ethics Statement

All studies presented in the paper were conducted in accordance with the recommendations of and approved by the ethics committee at the Mykolas Romeris University [protocol number: 3A(11.21-32002)-129)]. Procedures applied in this research comply with the national and international research ethics standards (i.e., Regulations of Psychological Testing in Lithuania; American Psychological Association Ethics Code; Helsinki declaration). An informed consent in written or electronic form was obtained from study participants' parents or legal guardians. Before starting to fill in the online questionnaires, participants were informed that they are not obliged to participate even if their parents gave consent for participation. Moreover, participants were informed that they can freely opt out from the study at any stage. Participants were briefly informed about the aims of the research, namely, to explore the attitudes of young people toward pro-environmental behavior. Participants were informed that their data will be kept confidentially and as soon as all the necessary stages of data processing are completed, the personal information (participants' names in Study 1 and special ID codes in Study 2 and 3) will be permanently removed with no possibility to restore personal information. The final datasets do not allow to track the identity of the participants and are therefore anonymous.

### 4.2.4 Analytic Strategy

We used the 23rd version of SPSS to calculate descriptive statistics and correlations, and to perform confirmatory factor analyses. To investigate the discriminant validity of the theoretical constructs, namely biospheric values, environmental self-identity and personal norms to act pro-environmentally, we used a confirmatory factor analysis, specifically the Oblique Multiple Group method (OMG; Nunnally, 1978). The OMG is commonly used to test the discriminant validity of above mentioned variables (Steg et al., 2012; van der Werff et al., 2013b, 2014b) and tests whether the data supports the a priori

assignment of the items to the respective subscales/dimensions (Stuive et al., 2008).

To investigate the relationships between the key variables and pro-environmental behavior, we applied Structural Equation Modeling (SEM) in Mplus 8.2. (Muthén & Muthén, 2015). We tested whether biospheric values are related to various pro-environmental behaviors via environmental self-identity and personal norms. We applied the robust unweighted least squares estimator (ULSMV) together with the theta parameterization. Theta parametrization is usually used when the model contains at least one ordinal variable. In the current research, ordinal variables were pro-environmental behaviors in all three studies and personal norms in Study 2, which are most appropriate procedures for such type of analysis (Muthén, 1993; Muthén & Asparouhov, 2002). The fit of the proposed model was evaluated with the following indices: *RMSEA* (the Root Mean Square Error of Approximation), *CFI* (the Comparative Fit Index), *TLI* (the Tucker-Lewis Index) and chi square ($\chi 2$). The fit of the model is considered acceptable when $RMSEA \leq 0.06$, $CFI \geq 0.90$, $TLI \geq 0.90$, and when the chi square ($\chi 2$) value is not significant (Little, 2013). Noteworthy, the chi square indice may result in rejecting acceptable models because the indice is sensitive to sample peculiarities. It is therefore most important to consider *CFI* and *TLI* values, which are the derivatives of chi square when controlling for sample size (Hooper et al., 2008). We used a common way to report significance levels of SEM, namely with confidence intervals (Schreiber et al., 2006).



### 4.2.5 Power Analysis

We employed a priori power analysis (Soper, 2019) to calculate the required sample size for the three studies. The analysis revealed that in order to conduct valid SEM analysis, when the effect size is .30, statistical power is .80 and the level of significance is .01, for Study 1 and Study 3 the recommended sample size is $n = 161$ (3 latent variables and 10 observed variables), and for Study 2, $n = 133$ (2 latent variables and 8 observed variables). The sample sizes of all studies exceeded the recommended threshold.

### 4.2.6 Questionnaire Order Effects

In cross-sectional questionnaire studies it is important to control for possible order effects (Podasakoff et al., 2003). We used three different datasets across

the three studies and applied relevant procedures to address this issue. In Study 1 and Study 2, the items were randomized within each scale measuring the key constructs (i.e., values, environmental self-identity, personal norms and pro-environmental behavior). In Study 3, two steps of randomization were followed. First, the items were randomized within each scale and second, the order of the scales measuring the key constructs was also randomized. In all three studies the demographic questions were presented at the beginning of the survey.

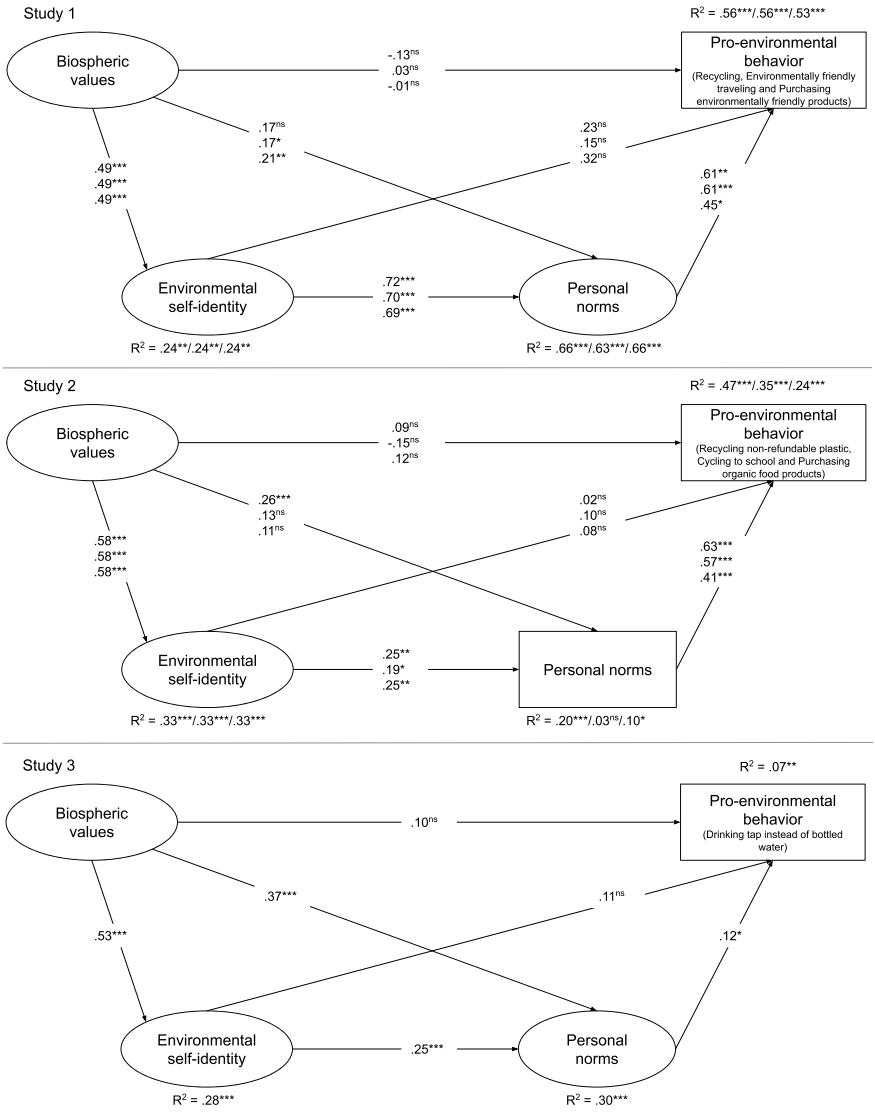
## 4.3 Results

### 4.3.1 Study 1

Correlations between key variables are provided in Supplementary Material 2. The model of the relationships between biospheric values, environmental self-identity, personal norms and the three types of pro-environmental behaviors fitted the data sufficiently well (recycling: $\chi 2(df) = 55.85(39)$, $p = .04$, *CFI/TLI* = .96/.95, *RMSEA* [90% CI] = .04 [.01, .06]; environmentally friendly traveling: $\chi 2(df) = 57.13(39)$, $p = .03$, *CFI/TLI* = .96/.95, *RMSEA* [90% CI] = .04 [.01, .07]; and purchasing environmentally friendly products: $\chi 2(df) = 64.19(39)$, $p = .01$, *CFI/TLI* = .95/.92, *RMSEA* [90% CI] = .05 [.03, .07]; Figure 3).

Biospheric values were indirectly related to the three pro-environmental behaviors via environmental self-identity and personal norms (Table 2). Specifically, biospheric values explained 24% of the variance in environmental self-identity, which in turn was strongly related to personal norms. Together, biospheric values and environmental self-identity explained 66, 63, and 66% of the variance in personal norms to recycle, travel environmentally friendly and purchase sustainably produced goods, respectively. Personal norms, in turn, explained 56, 56, and 53% of variance in the three respective behaviors. In addition, biospheric values were also directly and moderately strongly related to the personal norms to travel environmentally friendly and to purchase environmentally friendly products.

**Figure 3** Standardized Regression Coefficients of the Direct Model Paths for Environmental Considerations and Pro-Environmental Behaviors in Three Studies in Adolescents' Sample




*Note*. ns, non-significant; *$p < .05$, **$p < .01$, ***$p < .001$. In Study 1 and Study 2 each coefficient represents three behaviors, respectively.

**Table 2** The Indirect Effects of Adolescents' Biospheric Values and Environmental Self-Identity on Pro-Environmental Behaviors

| **Study 1** | | | **Study 2** | | | **Study 3** | | |
|---|---|---|---|---|---|---|---|---|
| | **→ Behavior** | | | **→ Behavior** | | | **→ Behavior** | |
| **Indirect paths** | **Estimate [95% CI]** | ***SE*** | **Indirect paths** | **Estimate [95% CI]** | ***SE*** | **Indirect paths** | **Estimate [95% CI]** | ***SE*** |
| **Recycling** | | | **Recycling non-refundable plastic** | | | **Drinking water from the tap or well** | | |
| (SUM) | **.43 [.29; .62]** | .08 | (SUM) | **.27 [.18; .38]** | .05 | (SUM) | **.12 [.05; .19]** | .03 |
| BIO®ESI® PN® | **.22 [.10; .42]** | .09 | BIO®ESI® PN® | **.09 [.03; .15]** | .03 | BIO®ESI® PN® | **.02 [.001; .03]** | .01 |
| BIO®ESI® | .11 [-.09; .30] | .10 | BIO®ESI® | .01 [-.06; .11] | .04 | BIO®ESI® | .06 [-.002; .12] | .03 |
| BIO® PN® | .10 [-.01; .26] | .07 | BIO® PN® | **.16 [.07; .26]** | .05 | BIO® PN® | **.04 [.004; .09]** | .02 |
| ESI® PN® | **.44 [.21; .81]** | .16 | ESI® PN® | **.16 [.05; .26]** | .06 | ESI® PN® | **.03 [.002; .06]** | .02 |
| **Environmentally friendly traveling** | | | **Cycling to school** | | | | | |
| (SUM) | **.38 [.26; .53]** | .07 | (SUM) | .05 [-.09; .18] | .07 | | | |
| BIO®ESI® PN® | **.21 [.12; .39]** | .07 | BIO®ESI® PN® | **.06 [.01; .13]** | .03 | | | |
| BIO®ESI® | .08 [-.08; .19] | .07 | BIO®ESI® | .06 [-.07; .18] | .06 | | | |
| BIO® PN® | .10 [-.002; .22] | .06 | BIO® PN® | -.07 [-.16; .01] | .04 | | | |
| ESI® PN® | **.42 [.28; .70]** | .11 | ESI® PN® | **.11 [.01; .21]** | .05 | | | |
| **Purchasing environmentally friendly products** | | | **Purchasing of organic food products** | | | | | |
| (SUM) | .41 [.29; .56] | .07 | (SUM) | **.15 [.04; .25]** | .05 | | | |
| BIO®ESI® PN® | **.15 [.03; .30]** | .07 | BIO®ESI® PN® | **.06 [.02; .10]** | .02 | | | |
| BIO®ESI® | .16 [-.01; .38] | .10 | BIO®ESI® | .05 [-.05; .14] | .05 | | | |
| BIO® PN® | **.10 [.004; .24]** | .06 | BIO® PN® | .04 [-.01; .11] | .03 | | | |
| ESI® PN® | **.31 [.06; .59]** | .14 | ESI® PN® | **.10 [.03; .17]** | .04 | | | |

*Note. CI* – confidence interval; *SE* – standard error; BIO – biospheric values; ESI – environmental self-identity; PN – personal norm; SUM – cumulative indirect effect.

Study 1 provides the first evidence that adolescents' biospheric values can facilitate, via environmental self-identity and personal norms, pro-environmental behaviors such as recycling, environmentally friendly traveling and purchasing environmentally friendly products. In Study 2, we test whether the results can be replicated for more specific pro-environmental behaviors. In addition, we targeted a different region in Lithuania (Figure 2) to cross-validate our findings.



### 4.3.2 Study 2

All correlations between key variables are provided in Supplementary Material 2. The model of the relations between biospheric values, environmental self-identity, personal norms and three specific pro-environmental behaviors fitted the data sufficiently well (recycling non-refundable plastics $\chi 2(df) = 48.53(23)$, $p = .001$, *CFI/TLI* = .93/.90, *RMSEA* [90% CI] = .06 [.03, .08]; cycling to school $\chi 2(df) = 35.71(23)$, $p = .04$, *CFI/TLI* = .97/.95, *RMSEA* [90% CI] = .04 [.01, .06]; and purchasing organic food products $\chi 2(df) = 43.41(23)$, $p = .01$, *CFI/TLI* = .95/.92, *RMSEA* [90% CI] = .05 [.03, .07]; Figure 3).

Biospheric values were indirectly related to the three pro-environmental behaviors via environmental self-identity and personal norms (Table 2). Specifically, biospheric values explained 33% of the variance in environmental self-identity, which in turn was related to personal norms with the strength varying from small to moderate. Together, biospheric values and environmental self-identity explained 20, 3, and 10% of the variance in personal norms to recycle non-refundable plastics, cycle to school and purchase organic food products, respectively. Personal norms were strongly related to the respective behaviors and explained, accordingly, 47, 35 and 24% of variance in these behaviors. Also, biospheric values were directly and moderately strongly related to moral obligation to recycle non-refundable plastics.

In Study 2, we found that biospheric values can also explain, via environmental self-identity and personal norms, a significant amount of variance in adolescents' more specific pro-environmental behaviors, namely recycling non-refundable plastic, cycling to school and purchasing organic food products. Yet, the relationship between environmental self-identity and the three types of personal norms was of small to moderate strength and weaker than in Study 1. In Study 3, we test whether the same relationships hold for

another specific pro-environmental behavior, namely drinking water from the tap. Again, we target a different region in Lithuania (Figure 2) to cross-validate the findings.

### 4.3.3 Study 3

Correlations between key variables are provided in Supplementary Material 2. The model of the relations between biospheric values, environmental self-identity, personal norms and a specific pro-environmental behavior – to drink tap water or water from the well - fitted the data sufficiently well ($\chi 2(df)$ = 155.98(39), $p < .001$, *CFI/TLI* = .92/.89, *RMSEA* [90% CI] = .06 [.04, .07]; Figure 3).

Biospheric values were indirectly related to behavior via environmental self-identity and personal norms (Table 2). Specifically, biospheric values were strongly related to and explained 28% of the variance in environmental self-identity, which in turn was moderately strongly related to personal norms. Next, biospheric values and environmental self-identity explained 30% of the variance in personal norms to not drink bottled water. Personal norms were rather weakly related to the drinking water from the tap or well behavior and explained 12% of the variance in this behavior. Also, biospheric values were moderately directly related to personal norms.

In Study 3 we again found that biospheric values could explain adolescents' very specific pro-environmental behavior, namely drinking less bottled water, via environmental self-identity and personal norms.

## 4.4 Discussion

Biospheric values, environmental self-identity and personal norms can strengthen people's intrinsic motivation to engage in various pro-environmental behaviors and could therefore be targeted in order to effectively promote pro-environmental behavior (Ruepert et al., 2016; Steg, 2016; van der Werff & Steg, 2016). It is important to study whether environmental considerations influence pro-environmental behaviors of adolescents too, since it is crucial to motivate the youth and future generations to act pro-environmentally to address global environmental crisis. We carried out three studies to find out. Overall, across three studies in different regions in Lithuania, we have found initial evidence

that general environmental considerations can motivate adolescents to engage in a range of pro-environmental behaviors.

First, in all three studies we found that adolescent's biospheric values can be distinguished from altruistic, egoistic and hedonic values. This extends previous evidence which showed that universalism values, which encompass both biospheric and altruistic values, can be empirically distinguished from other values in adolescents (Cieciuch et al., 2013; Liem et al., 2010; Paez & De-Juanas, 2015; Schwartz et al., 2001; Schwartz, 2012a; Zeiske et al., 2020). Our finding that biospheric values in particular can be distinguished from other values suggests that biospheric values already form a distinct value type in adolescence. Also, we found that adolescents' biospheric values, environmental self-identity and personal norms to act pro-environmentally can be empirically distinguished from each other, which has so far been shown for adults only (Ruepert et al., 2016; van der Werff et al., 2013a, 2013b; van der Werff & Steg, 2016). This indicates that these moral and identity structures, although still under development and unstable, can already be distinguished among adolescents. Next, most importantly, we found that adolescents' biospheric values were associated to various pro-environmental behaviors via environmental self-identity and personal norms to act pro-environmentally.

We found that environmental considerations were associated with general (e.g., purchasing environmentally friendly products) as well as more specific (e.g., purchasing organic food products) environmental behaviors. This provides support that general environmental considerations, such as biospheric values and environmental self-identity, can explain a large variety of behaviors. Yet, we also found that more general behaviors, for example recycling (Study 1), were more strongly related to biospheric values, environmental self-identity and personal norms than more specific behaviors, for example recycling non-refundable plastics (Study 2) and drinking water from the tap (Study 3). Specifically, environmental self-identity was less strongly associated with personal norms to engage in these specific behaviors, especially cycling to school. Also, the relationship between personal norm to drink tap water and the respective behavior was relatively weak. The principle of compatibility implies that constructs are more strongly related if they are measured at the same level of generality or specificity (Ajzen, 1996). Yet, this could not explain why in some cases we found that general constructs, such as biospheric values,

were strongly related to specific constructs, such as the personal norm to drink tap water (see also Ruepert et al., 2016). Rather, we propose that general environmental considerations determine a general tendency to act pro-environmentally, yet other factors play a role once people consider engaging in a specific behavior (Rim et al., 2013; Trope & Liberman, 2012). Even if people's environmental considerations are strong, other factors may prevent them from acting upon these considerations. For example, pro-environmental behavior can be relatively costly (e.g., purchasing organic products) and adolescents may simply not have control over certain behaviors (e.g., choice for the means of transportation). Indeed, perceived behavioral control (i.e., thinking that one has means and resources to perform certain behavior) could be the factor that is important in explaining why adolescents do not adopt certain pro-environmental behaviors (Theory of Planned Behavior; Ajzen & Fishbein, 1980, 2005; Fishbein & Ajzen, 1975). Perceived risks to behavior such as safety (e.g., to drink tap water instead of bottled water; van der Linden, 2013) could also explain why adolescents (not)engage in these behaviors. Furthermore, social norms, especially among peers, could influence whether or not adolescents engage in specific behaviors. For example, they may be reluctant to drink tap water if social norms to drink bottled water prevails among adolescents. Relatedly, environmental considerations may better predict behaviors that are less constrained by situational barriers and/or done mostly in private. Thus, private behaviors, for example recycling or taking shorter showers, may sometimes be more easily adopted and performed. Future studies could examine which factors and to what extent moderate the relationship between biospheric values and various pro-environmental behaviors of adolescents.

Interestingly, we found that in all three studies adolescents' biospheric values were stronger than their egoistic values and, in some cases, than their hedonic values (Study 3), while previously research has suggested that adolescents' biospheric values may be surpassed by their self-enhancement values (Schwartz, 2012a; Vecchione et al., 2019). Our findings in fact indicate that adolescents have rather strong biospheric values. At the same time, a comparison with a recent study in Lithuania with adults (Supplementary Material 4; Balundė et al., 2019) reveals that biospheric and altruistic values of adolescents in the current study were slightly weaker and egoistic values were slightly stronger compared to adults; for hedonic values there was no such consistent pattern.

These results are in line with previous evidence that biospheric values may be weaker in adolescence than later in life (Schwartz, 2012a; Vecchione et al., 2019). Yet, we cannot test across the two studies whether there are significant differences between the values of adolescents and adults. Overall, our findings suggest that adolescents may already have relatively strong biospheric values, but these values could still become stronger later in life. Future studies could test whether biospheric as well as other values, environmental self-identity, personal norms and pro-environmental behavior significantly differ between adolescents and adults. Also, longitudinal studies are needed to examine how these key constructs change throughout the lifetime of individuals and across different cohorts and which key factors influence these changes. For example, increasing societal debate on climate issues could potentially strengthen the environmental considerations and/or the effects of these considerations on environmental behavior.

The current findings have important implications for policies to promote adolescents' pro-environmental behavior. Specifically, we show that biospheric values could be a gateway for adolescents' many pro-environmental behaviors. Biospheric values, environmental-identity, and personal norms to act pro-environmentally are still forming in adolescence, and it could be the best time to strengthen them. Several directions for policy can be distinguished. First, there is preliminary evidence that education about nature makes adolescents feel more connected to nature (e.g., Jordan et al., 2013; Jordan & Chawla, 2019) and could potentially strengthen their biospheric values (Martin & Czellar, 2017). Thus, policies could aim at strengthening adolescents' biospheric values via environmental education (Jordan et al., 2013) and activities in nature (Collado et al., 2013). This could be relevant for higher and university education too. There are already programs appearing in higher formal education such as environmental psychology, sustainable leadership, and sustainable development, among others, that target sustainability issues and potentially can strengthen environmental considerations of young people. Future studies could look at the effects of such programs on the students' biospheric values, environmental self-identity and personal norms. Second, environmental self-identity could potentially be strengthened by reminding people of their past pro-environmental behavior, even if behaviors were rather rarely performed (Fanghella et al., 2019; Lacasse, 2016; van der Werff et al., 2014a, 2014b). This could be done,

for example, by evaluating adolescents' pro-environmental behaviors with self-reports (e.g., in school settings), that they most certainly would engage in, and then providing them with feedback about their pro-environmental behavior. Also, some unique behaviors (e.g., participating in climate march or volunteering for forest clean-up project) that could strongly signal adolescents' environmental self-identity could be included in the evaluation too. Third, perceived peers' social norms to act pro-environmentally could enhance adolescents' personal norms and their pro-environmental behavior (Collado, Staats, et al., 2017), especially because adolescents are very susceptive to peer influence (Kerr et al., 2003). An effective measure may be to give adolescents feedback about pro-environmental behavior of their peers. This could be done similarly as in studies with adults where participants of a recycling program were getting feedback about the recycling behavior of their neighbors; knowing that others recycled more increased people's recycling behavior (Schultz, 1999). Future studies could test whether such different interventions are effective to strengthen adolescents' biospheric values and environmental self-identity and in turn whether there is an effect of such interventions on pro-environmental behavior. Fourth, besides strengthening environmental considerations, we suggest that it is important to address contextual factors such as removing barriers for specific pro-environmental behaviors (e.g., ensuring easy access to tap water). Yet future studies are needed to test whether environmental education and removing barriers for certain behaviors can indeed lead to more pro-environmental behavior.

Some limitations should be considered when interpreting the current findings. First, we cannot draw definite conclusions about causal relationships between biospheric values, environmental self-identity, personal norms and environmental behaviors. Past studies give initial evidence of causal relationships between these variables. For example, universalism values (encompassing biospheric and altruistic values) measured in one time point predicted environmental behavior of adults measured after a year (Thøgersen & Ölander, 2002). Also, manipulating environmental self-identity in experiments resulted in changes in environmental behavior (van der Werff et al., 2014b). Future studies could test whether these results can be replicated for adolescents. Second, the current research was conducted with adolescents in Lithuania; future studies could test whether this relationship holds for adolescents in

other parts of the world. Third, we did not measure how adolescents perceived the studied behaviors, for example as easy or difficult. Perceived difficulty of behaviors could potentially explain why biospheric values, environmental self-identity and personal norms are related stronger to some behaviors than others. Also, the extent to which adolescents think that certain behaviors are common among their peers could influence the relationships between their biospheric values and these behaviors. Fourth, we studied how important people find protecting nature and the environment in general, without distinguish for which reasons. Follow-up research could test whether, for example, adolescents engage in different types of pro-environmental behavior depending on the reasons why they value the environment, including for selfish reasons (i.e., anthropocentric) or for the wellbeing of nature itself (i.e., ecocentric; Thompson & Barton, 1994). For example, future studies could test which motivation, ecocentric, anthropocentric or both drives young people to recycle, chose environmentally friendly transportation means, among others. Fifth, despite the efforts to reduce chances of deceitful answers and the effect of social desirability these biases could potentially affect the results of the studies. Although, according to recent study the effect of social desirability bias in pro-environmental behavior studies is rather weak (Vesely & Klöckner, 2020), it is nevertheless important to consider this possible limitation. Future studies could test whether this potential compound affects the relationship between biospheric values, environmental self-identity, personal norms and pro-environmental behavior in adolescents' studies. This is possible through controlling tested models/relationships for general social desirability as well as testing to what extent social norms moderate the relationships between social desirability and variables in question (Vesely & Klöckner, 2020). Sixth, in this study we targeted environmental sustainability in particular, but it is also important to study which factors motivate people to engage in other types of sustainable actions (e.g., reducing inequalities) on an individual as well as organizational and institutional level (e.g., sustainable businesses and industry). Future studies could test to what extent different values, namely, biospheric, altruistic, egoistic and hedonic, on an individual as well as a group level, explain different aspects of sustainability (i.e., environmental, social, and economic; United Nations, 1987; United Nations General Assembly – UNGA, 2012) or sustainable development goals (e.g., ensure sustainable consumption,

reduce inequality, promote sustainable economic growth, etc.; United Nations, 2015). For example, altruistic values could be particularly important for explaining protection of marginalized groups.

In conclusion, we provide evidence that adolescents' environmental behavior can be rooted in their biospheric values, environmental self-identity and personal norms to act pro-environmentally. The findings suggest that policies aimed at promoting pro-environmental behavior of adolescents may benefit from targeting biospheric values, environmental self-identity and personal norms, thereby strengthening adolescents' intrinsic motivation to act pro-environmentally. Accordingly, we proposed some future directions for such policies. Also, this study extends previous research on biospheric values, environmental self-identity and personal norms beyond adult samples.

# CHAPTER 5

## Exploring Adolescents' Waste Prevention Via Value-Identity-Personal Norm and Comprehensive Action Determination Models

Chapter 5 is built on the following publication: Balundė, A., Jovarauskaitė, L., & Poškus, M. S. (2020). Exploring adolescents' waste prevention via value-identity-personal norm and comprehensive action determination models. *Journal of Environmental Psychology, 72*, 101526.
https://doi.org/10.1016/j.jenvp.2020.101526.

## Abstract

We explored to what extent two theoretical approaches – general (i.e., the Value-Identity-Personal norm model), and behavior-specific (i.e., the Comprehensive Action Determination Model) can explain different waste prevention behaviors. In Study 1 we investigated bottled water consumption, while in Study 2 we investigated bag reuse when shopping, giving away or selling unused items, and purchasing unpackaged goods. The results of Study 1 (349 adolescents from 13 to 18 years of age (54.7% were female), convenience sample) and Study 2 (508 adolescents from 13 to 17 years of age (49% were female), nationally representative random sample) indicated that both approaches predict behaviors substantially well. Among other factors, biospheric values, environmental self-identity, social norm, personal norm, and habit were found to be the most prominent contributors for their models. Both general and behavior-specific approaches have value in informing policies for lowering adolescents' waste generation and potentially could be used in tandem.

## 5.1 Introduction

With this study we aim to investigate two relatively recent theoretical approaches: the Value-Identity-Personal norm model (VIP) (Ruepert et al., 2016; van der Werff & Steg, 2016) and the Comprehensive Action Determination Model (CADM) (Klöckner, 2013a; Klöckner & Blöbaum, 2010) that cover the most relevant factors in explaining pro-environmental behavior. These models propose two different motivational routes (a general values- and identity-driven path in the case of the VIP, and a behavior-specific path in the case of the CADM) that could be relevant in explaining waste prevention behaviors. We explore these models in two samples of adolescents.



### 5.1.1 The VIP Model

The VIP model consists of three components. The first and core component of the model are biospheric values that reflect one's belief that nature is the object of conservation and nature is important in its own right (Steg et al., 2012). Numerous studies have found that biospheric values are essential in creating a solid background for various pro-environmental actions (Balundė et al., 2019; Boomsma & Steg, 2014; Hiratsuka et al., 2018; Martin & Czellar, 2017; Namazkhan et al., 2019; Nilsson et al., 2016; Ruepert et al., 2016; van den Broek et al., 2017; van der Werff et al., 2013b). Biospheric values are a crucial antecedent of intention to act in environmentally beneficial ways and actual pro-environmental behavior, but they are mainly indirectly related to behavior and intentions via environmental self-identity. One who has a strong environmental self-identity is considered to think of herself as a person who acts in environmentally unharmful ways and behaves accordingly (van der Werff et al., 2013b). Environmental self-identity has been found to be related to various pro-environmental actions (Barbarossa & De Pelsmacker, 2016; Lalot et al., 2019; van der Werff et al., 2014b; Whitmarsh & O'Neill, 2010). Biospheric values and environmental self-identity are general in nature and are distant from behavior. Personal norms, or the sense of moral obligation to act in a certain environmentally friendly way, connect these general antecedents to pro-environmental behavior by motivating individuals to act upon their environmental self-identity (van der Werff et al., 2013a). Personal norms have been found to predict a wide range of pro-environmental intentions and behaviors (Barbarossa & De Pelsmacker, 2016; Nordlund & Garvill,

2003; Ruepert et al., 2016; van der Werff et al., 2013a). In many of the previously mentioned studies only separate parts of the VIP model were tested. More recent studies found initial evidence that the full VIP model predicts residents' interest and participation in smart energy systems (van der Werff & Steg, 2016) and employees' conservation behavior at the workplace in organizations with an environmental background (Ruepert et al., 2016).

### 5.1.2 The CADM

The CADM is based on the Theory of Planned Behavior (TPB) (Ajzen, 1991) and the Norm Activation Model (Schwartz, 1977) additionally capturing habitual and situational factors. In this framework normative predictors consist of both social and personal norms as well as awareness of need to change one's behavior and awareness of consequences of one's behavior. Social norm describes the degree of perceived social pressure to act or not to act pro-environmentally (Fishbein & Ajzen, 2010). Personal norm reflects the moral obligation to behave in an environmentally-friendly way, while awareness of need captures the perceived understanding that someone or something is in need of help; awareness of consequences refers the extent to which an individual perceives their behavioral outcomes as negative (Schwartz, 1977). To activate the moral obligation to act pro-environmentally an individual has to feel some degree of pressure from their social environment, needs to be familiar with the existing need for a behavior, and has to be aware of the consequences of their behavior. Normative factors lead to behavior through additional variables, i.e., intention and habit. Here habit is defined as an automatic action formed through frequent similar situations in the past in which a specific behavior was performed (Fishbein & Ajzen, 2010).

The CADM also contains situational factors such as perceived behavioral control and access to behavior. Perceived behavioral control refers to the perceived capacity to perform an action (Fishbein & Ajzen, 2010), while access to behavior captures the availability of those actions (Klöckner & Blöbaum, 2010). Situational factors reflect the perceived environment and infrastructure and function as direct and indirect predictors of behavior (Klöckner & Blöbaum, 2010). The validity of the CADM was tested meta-analytically (Klöckner, 2013a) and several studies have also shown promising results of the CADM explaining pro-environmental behavior (Klöckner & Friedrichsmeier, 2011; Klöckner &

Oppedal, 2011; Ofstad et al., 2017; Sopha & Klöckner, 2011; van den Broek et al., 2019).

### 5.1.3 Aim of the Present Studies

We aim to test the extent to which general and behavior specific antecedents reflected in two theoretically distinct approaches explain aspects of waste prevention of adolescents. Both models capture normative factors of pro-environmental behavior and overlap by personal norm and intention. Unlike the CADM, the VIP enables us to evaluate the role of values and identity in pro-environmental behavior; the CADM contains, among other things, habitual and situational factors. For this study, we chose such behaviors as shopping with reusable bags, selling or donating personal stuff that is no longer in use, buying unpackaged groceries, and refraining from bottled water consumption.



### 5.1.4 Analysis Strategy

Analyses were run using Mplus 7.11 (Muthén & Muthén, 2017). Robust unweighted least squares estimation (ULSMV) was used for all analyses, along with theta parameterization. This estimation method is appropriate for models that have categorical variables and was chosen to deal with single-item measures that can be interpreted as categorical. The VIP (van der Werff & Steg, 2016) and the CADM (Klöckner & Blöbaum, 2010) models were specified based on their structure established in previous studies. The initial CADM model was amended with a path from intention to habit which was reported in previous studies of the CADM (Klöckner, 2013a; Klöckner & Oppedal, 2011)[25]. Based on model fit investigations, a path from awareness of consequences to behavior was included. The aforementioned path was also found to be significant in a previous study of young adults (Haustein et al., 2009). In all analyses in both studies there were a few missing cases (from 1 to 8, depending on the analysis) which were removed from the analysis using pairwise deletion. According to (Kline, 2011), structural equation models need to have at least 5 to 1 ratio

25 Since habit is an automatic behavioral response to environmental cues, one might negotiate the relationship between habit and intention since the intention is a conscious consideration to engage in a particular behavior. However, intention can hold a stronger effect on habits when the habit is relatively weak (Klöckner, 2013a).

of observations to estimated parameters; in our most complex models we estimated 43 parameters, making our minimal sample size 215. We set a goal of at least 300 observation for Study 1 and at least 500 observations for Study 2 as our target sample size.

## 5.2 Study 1

### 5.2.1 Method

#### *5.2.1.1 Sample Characteristics*

The sample consists of 349 adolescents from 13 to 18 years of age (54.7% were female). Mean participant age was 16 years of age ($SD$ = 1). Participants were recruited through convenience sampling from several schools in Lithuania. We recruited one school from a city and two schools from smaller towns to capture a more diverse respondent base.

#### *5.2.1.2 Procedure*

The survey was conducted during an arranged time in the participating schools. Consent was obtained from the schools' administrations, as well as from the parents or legal guardians of the participating adolescents (parents or legal guardians had the opportunity to withdraw their consent at any time). Study participants were informed that the study is anonymous and that their participation is completely voluntary, and they have the right to withdraw from participation at any time. Filling in the questionnaire battery took approximately 20 min.

#### *5.2.1.3 Measures*

Biospheric values were assessed with four items (Steg et al., 2012). Participants indicated on a nine-point scale to what extent they find different values important as guiding principles of their life. The scale ranged from −1 *opposed to my guiding principles*, and 0 *not important*, to 7 *of supreme importance*. The scale showed good internal consistency ($\omega$ = .87, $\alpha$ = .87).

Environmental self-identity was assessed with three items (van der Werff et al., 2013b). Participants rated three items such as "Acting pro-environmentally in an important part of who I am" on a seven-point Likert scale ranging from

1 *completely disagree* to 7 *completely agree*. The scale showed good internal consistency ($\omega = .74$, $\alpha = .73$).

Personal norm, social norm, awareness of need, awareness of consequences, habit, intention, perceived behavioral control, and access to behavior were all assessed with 1 item each, ranging from 1 *completely disagree* to 5 *completely agree*. Self-reported behavior was assessed with 1 item rated from 1 *never or almost never* to 5 *constantly or almost constantly*. Single-item measures for each variable were constructed based on previous research by other authors (Carrus et al., 2008; Heath & Gifford, 2002; Klöckner & Friedrichsmeier, 2011; Klöckner & Ohms, 2009; Schwartz, 1977; van der Werff et al., 2013a). These items were all directed at bottled water consumption. Single-item measures, while not optimal in all cases, can be used to assess constructs that are very clear and precise (Fisher et al., 2016; Hoeppner et al., 2011; Schwartz, 1977), thus we opted to assess all behavior-specific constructs with single items (Klöckner & Ohms, 2009). All items used for both Study 1 and Study 2 are available in Supplementary Materials[26].



#### *5.2.1.4 Managing Order Effects*

Environmental self-identity was assessed before all other measures so as not to affect identity through making values and behaviors salient (van der Werff et al., 2014b). Items were presented in random order within each scale (Poškus & Sadauskaitė, 2015).

### 5.2.2 Results

Descriptive statistics of all variables used in Study 1 are presented in Table 1. As expected, most correlations among the variables are significant. Two path analyses were run to investigate both the VIP and the CADM models of bottled water consumption, using the same dependent variables – self-reported behavior of consuming bottled water and intention not to consume bottled water.

26 Supplementary materials are available at the Open Science Framework page https://osf.io/7c8a9/?view_only=209413f7d8e140debba7634eb19820bf.

**Table 1** Descriptive Statistics of All Variables Used in Study 1

| | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. BIOS | 4.36 | 1.87 | | | | | | | | | | |
| 2. ESI | 3.60 | .64 | .44*** [.36, .52] | | | | | | | | | |
| 3. SN | 2.55 | 1.18 | .12* [.01, .22] | .11* [.003, .21] | | | | | | | | |
| 4. AN | 3.74 | 1.02 | .25*** [.15, .35] | .09 [-.01, .20] | .27*** [.17, .36] | | | | | | | |
| 5. AC | 3.60 | 1.04 | .22*** [.12, .32] | .10 [-.01, .20] | .31*** [.21, .40] | .65*** [.58, .70] | | | | | | |
| 6. PN | 2.81 | 1.16 | .18*** [.08, .28] | .11* [.01, .22] | .52*** [.44, .60] | .31*** [.21, .40] | .36*** [.26, .45] | | | | | |
| 7. HAB | 2.85 | 1.31 | -.08 [-.18, .03] | -.10 [-.20, .01] | -.04 [-.14, .07] | -.04 [-.14, .07] | -.06 [-.16, .05] | -.30*** [-.39, -.20] | | | | |
| 8. INT | 2.95 | 1.24 | .24*** [.14, .33] | .14** [.03, .24] | .41*** [.32, .50] | .32*** [.22, .41] | .29*** [.19, .39] | .51*** [.42, .58] | -.38*** [-.47, -.29] | | | |
| 9. PBC | 3.95 | 1.10 | .24*** [.13, .33] | .06 [-.05, .17] | .15** [.04, .25] | .44*** [.35, .52] | .28*** [.18, .38] | .17** [.06, .27] | -.03 [-.13, .08] | .25*** [.15, .34] | | |
| 10. AB | 4.18 | 1.03 | .26*** [.16, .36] | .09 [-.02, .19] | .05 [-.06, .15] | .33*** [.23, .42] | .27*** [.16, .36] | .16** [.05, .26] | -.17** [-.27, -.06] | .21*** [.10, .30] | .38*** [.29, .47] | |
| 11.BEH | 3.32 | 1.30 | -.03 [-.14, .07] | -.08 [-.18, .03] | -.09 [-.19, .02] | -.08 [-.18, .03] | -.12* [-.22, -.02] | -.25*** [-.35, -.15] | .48*** [.40, .56] | -.35*** [-.44, -.25] | -.09 [-.20, .01] | -.03 [-.13, .08] |

*Note.* * $p < .05$, ** $p < .01$, *** $p < .001$. Confidence intervals (95%) are presented in brackets for correlations. BIOS – biospheric values; ESI – environmental self-identity; SN – social norm ("People who are important to me prefer that I do not buy bottled water"); AN – awareness of need ("Buying bottled water contributes to environmental problems"); AC – awareness of consequences ("By not buying bottled water I am conserving the environment"); PN – personal norm ("I feel morally obliged not to buy bottled water"); HA – habit ("I have a habit of buying bottled water"); IN – intention ("I truly intend not to buy bottled water during the next 4 weeks"); PBC – perceived behavioral control ("It is up to me whether I will use drinking water from the tap, a spring, or a well during the next 4 weeks"); AB – access to behavior ("I have access to places where I can get drinking water from the tap, a spring, or a well"); and BEH – Self-reported behavior ("I bought bottled water").

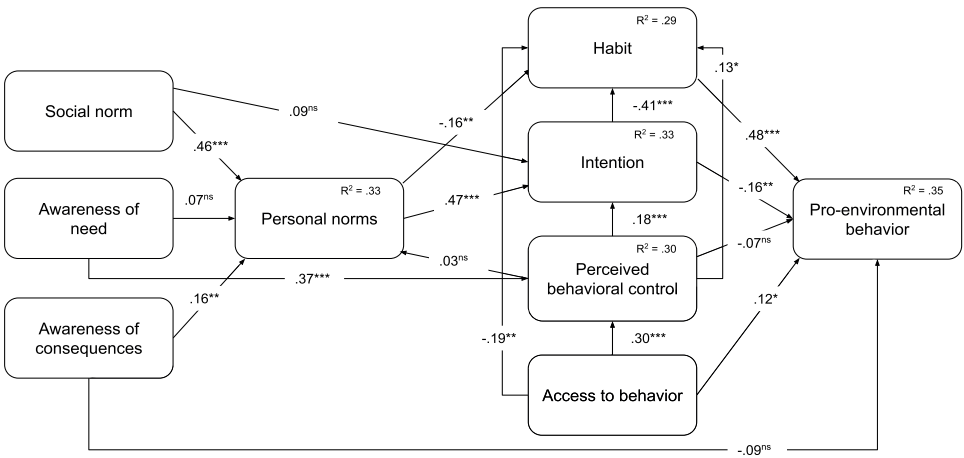
**Table 2** Results from Structural Equation Modeling Analysis of Study 1

| Path | *B* | LL | UL | *S.E.* | *p* | Beta | $R^2$ | Path | *B* | LL | UL | *S.E.* | *p* | Beta | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CADM model<br>*CFI* = .98, *TLI* = .94, *RMSEA* = .05 [.0, .08]<br>$\chi 2(12) = 20.66$, $p = .06$ | | | | | | | | VIP model<br>*CFI* = .95, *TLI* = .91, *RMSEA* = .05 [.03, .07]<br>$\chi 2(28) = 50.91$, $p = .005$ | | | | | | | |
| AC→ BEH | -.10 | -.25 | .05 | .08 | .183 | -.09 | | BIOS→ ESI | .27 | .21 | .32 | .03 | **<.001** | .58 | |
| HAB→ BEH | .50 | .37 | .62 | .06 | **<.001** | .48 | | ESI | | | | | | | .33 |
| INT→ BEH | -.16 | -.26 | -.05 | .05 | **.003** | -.16 | | BIOS→ PN | .10 | .01 | .19 | .05 | **.04** | .16 | |
| PBC→ BEH | -.08 | -.20 | .04 | .06 | 0.2 | -.07 | | ESI→ PN | .10 | -.10 | .30 | .10 | .33 | .08 | |
| AB→ BEH | .14 | .02 | .27 | .07 | **.03** | .12 | | PN | | | | | | | .05 |
| BEH | | | | | | | .35 | BIOS→ INT | .11 | .01 | .21 | .05 | **.03** | .15 | |
| SN→ INT | .10 | -.01 | .21 | .06 | .09 | .09 | | ESI→ INT | .02 | -.17 | .21 | .10 | .84 | .01 | |
| PN→ INT | .47 | .36 | .58 | .05 | **<.001** | .47 | | PN→ INT | .64 | .53 | .75 | .06 | **<.001** | .53 | |
| PBC→ INT | .18 | .06 | .28 | .05 | **.001** | .18 | | INT | | | | | | | .34 |
| INT | | | | | | | .33 | BIOS→ BEH | .06 | -.05 | .16 | .05 | .28 | .09 | |
| PN→ HAB | -.16 | -.28 | -.04 | .06 | **.01** | -.16 | | ESI→ BEH | -.06 | -.28 | .16 | .11 | .58 | -.05 | |
| PBC→ HAB | .13 | .02 | .24 | .06 | **.02** | .13 | | PN→ BEH | -.11 | -.23 | .02 | .06 | .10 | -.10 | |
| AB→ HAB | -.21 | -.35 | -.08 | .07 | **.002** | -.19 | | INT→ BEH | -.29 | -.40 | -.19 | .06 | **<.001** | -.33 | |
| INT→ HAB | -.40 | -.51 | -.29 | .06 | **<.001** | -.41 | | BEH | | | | | | | .15 |
| HAB | | | | | | | .29 | | | | | | | | |
| SN→ PN | .47 | .38 | .57 | .05 | **<.001** | .46 | | | | | | | | | |
| AN→ PN | .08 | -.08 | .24 | .08 | .33 | .07 | | | | | | | | | |
| AC→ PN | .19 | .05 | .33 | .07 | **.01** | .16 | | | | | | | | | |
| PBC→ PN | .03 | -.07 | .13 | .05 | .55 | .03 | | | | | | | | | |
| PN | | | | | | | .33 | | | | | | | | |
| AN→ PBC | .43 | .30 | .57 | .07 | **<.001** | .37 | | | | | | | | | |
| AB→ PBC | .35 | .24 | .46 | .05 | **<.001** | .30 | | | | | | | | | |
| PBC | | | | | | | .30 | | | | | | | | |

*Notes.* BIOS – biospheric values, ESI – environmental self-identity, SN – social norm, AN – awareness of need, AC – awareness of consequences, PN – personal norm, HAB – habit, INT – intention, PBC – perceived behavioral control, AB – access to behavior and BEH – self-reported behavior. LL – lower 95% confidence interval, UL – upper 95% confidence interval.

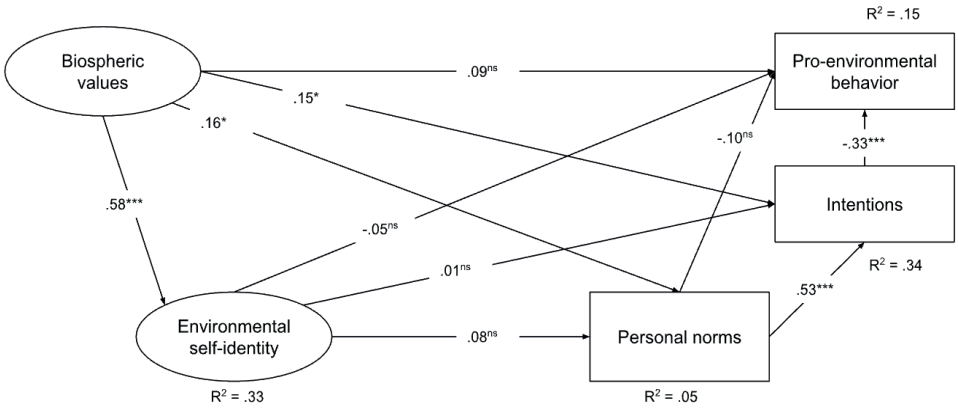
In this sample the CADM model initially did not fit the data well; however, adding an additional path leading from awareness of need toward perceived behavioral control substantially improved model fit. The theoretical background regarding the link between awareness of need and perceived behavioral control derives from the idea that awareness can be related to pro-environmental behavior through the constructs of the TPB. For example, Xu et al. (2020) found that environmental awareness positively predicted perceived behavioral control which, in turn, led to intention to purchase green furniture. The results of structural equation modeling are presented in Table 2, Figure 1 and Figure 2.

**Figure 1** Standardized Regression Paths of the CADM (N = 349)




*Note.* ns - non-significant, * $p < .05$, ** $p < .01$, *** $p < .001$.

**Figure 2** Standardized Regression Paths of the VIP model (N = 349)




*Note.* ns - non-significant, * $p < .05$, ** $p < .01$, *** $p < .001$.

Some of the paths in the CADM model were in an unexpected direction. For example, the path leading from access to behavior (one having access to water sources other than bottled water) was positively related to bottled water purchasing behavior. Similarly, perceived behavior control (one's subjective evaluation that it is up to oneself if one consumes water from sources other than bottled water) was positively related to the habit of purchasing bottled water. It may be that the respondents do believe that they have both access to and control over water sources other than bottled water, yet still opt to consume bottled water regardless, illustrating a strong habit of the aforementioned behavior. Indeed, habit was found to be the largest contributor in predicting bottled water purchasing behavior, thus illustrating that having access and control might not be enough in some instances, one must also consider old behavior patterns and active means to change them.

Given that the sample of this study was small, and the convenience sampling made the sample of limited usefulness for generalization, we opted to conduct further research in a representative sample, covering more behaviors.

## 5.3 Study 2

Study 2 expands upon Study 1 by investigating other behaviors indicating low consumption: bag reuse when shopping, giving away or selling unused items, and purchasing unpackaged goods. This study was intended to investigate whether the tested models perform equally for other behaviors. Additionally, this study was done in a representative sample to encompass a diverse base of respondents, since pro-environmental behaviors are approached differently by different social strata in Lithuania.

### 5.3.1 Method

#### *5.3.1.1 Sample and Procedure*

We gathered a representative random sample of Lithuanian adolescents. The sampling procedure was designed to make sure that the age, gender, and geographical distribution of the participants was representative of Lithuanian adolescents. A total of 508 adolescents participated in the study, their mean age was 15.10 ($SD$ = 1.49) and ranged from 13 to 17 years of age (49% of the participants were female). Our dataset contained additional measures that are not discussed in this paper. Consent to participate was obtained both from the participants and their parents or legal guardians.

#### *5.3.1.2 Measures*

Biospheric values ($\omega$ = .84, $\alpha$ = .84) and environmental self-identity ($\omega$ = .95, $\alpha$ = .95) were assessed the same way as in Study 1. Although the internal consistency of the environmental self-identity scale was slightly too high (Streiner, 2003), the same measure has been shown to have acceptable level of internal consistency and functioned well in Study 1. Personal norm, social norm, awareness of need, awareness of consequences, habit, intention, perceived behavioral control, access to behavior, and self-reported behavior were all assessed similarly to Study 1. These constructs were assessed for three behaviors: bag reuse when shopping, giving away or selling unused items, and purchasing unpackaged goods. See Supplementary Materials for items used in both Study 1 and Study 2.

#### *5.3.1.3 Questionnaire Order and Possible Order Effects*

The data used in the present study is taken from a large representative dataset and the questionnaire battery contained additional measures that are not discussed in this study. Effort was made to construct the questionnaire battery in a way that minimizes the possibility of question order effects or priming. Demographic data were gathered first, followed by measures of environmental self-identity and a scale assessing beliefs about climate change. Items asking for the frequency of various environmentally-relevant behaviors were presented next, followed by items assessing the components of the CADM[27]. Biospheric values were assessed last. The order of the items within all scales was inverted for half of the respondents, but the general order in which the scales were presented was maintained.



### 5.3.2 Results

As in the previous study, the ULSMV estimator with theta parameterization was used for model estimation. The same analytical strategy as in Study 1 was used to test the models. All models demonstrated sufficiently good model fit, with the VIP model fitting the data slightly better on all occasions, which is not unexpected given that the VIP model has a simpler structure than the CADM. Descriptive statistics of all variables used in Study 2 are presented in Supplementary Materials. Results and model fit indices are presented in Table 3, Figure 3 and Figure 4 (see Supplementary Materials[28] for a model that combines both VIP and CADM).

27 In this study, we used the original structure of the model and did not include an additional path from awareness of need to perceived behavioral control, as we did in Study 1; we did this because adding this path in Study 2 did not improve the model fits for all behaviors, but for some behaviors, the model fit even decreased.

28 Each model independently explains a significant amount of variance of pro-environmental behavior, thus it is worthwhile to test to what extent joint models can explain various pro-environmental behaviors (see Supplementary material). We thank the two anonymous reviewers for bringing this idea forward.

**Table 3** Results from Structural Equation Modeling Analysis of Study 2

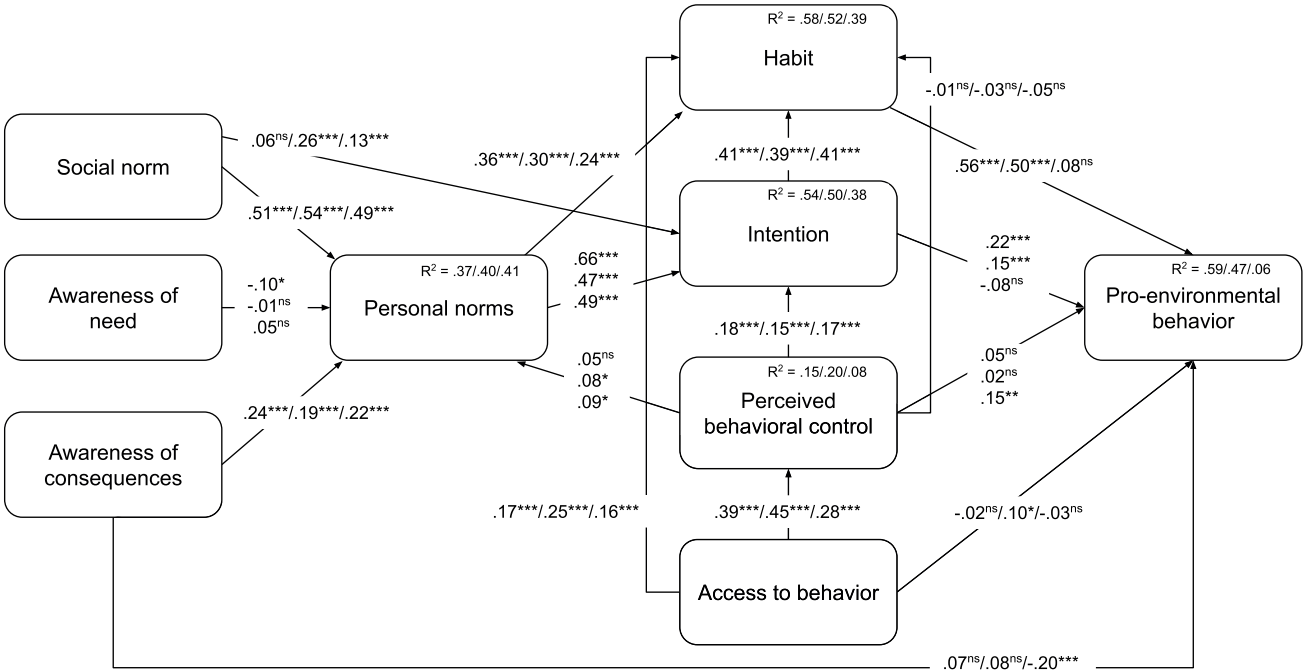
| Path | *B* | LL | UL | *S.E.* | *p* | Beta | $R^2$ | Path | *B* | LL | UL | *S.E.* | *p* | Beta | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bag reuse when shopping: CADM model *CFI* = .94, *TLI* = .85, *RMSEA* = .09 [.07, .11]), $\chi2(13) = 63.68$, $p<.001$ | | | | | | | | Bag reuse when shopping: VIP model *CFI* = .99, *TLI* = .98, *RMSEA* = .04 [.02, .06] $\chi2(28) = 50.13$, $p = .006$ | | | | | | | |
| AC→ BEH | .15 | -.03 | .34 | .09 | .11 | .07 | | BIOS→ ESI | .59 | .48 | .71 | .06 | **<.001** | .53 | |
| HAB→ BEH | .57 | .47 | .67 | .05 | **<.001** | .56 | | ESI | | | | | | | .28 |
| INT→ BEH | .23 | .13 | .34 | .05 | **<.001** | .22 | | BIOS→ PN | .15 | -.04 | .34 | .10 | .13 | .08 | |
| PBC→ BEH | .08 | -.04 | .19 | .06 | .18 | .05 | | ESI→ PN | .72 | .54 | .91 | .09 | **<.001** | .44 | |
| AB→ BEH | -.05 | -.20 | .10 | .08 | .55 | -.02 | | PN | | | | | | | .23 |
| BEH | | | | | | | .59 | BIOS→ INT | .20 | -.003 | .40 | .10 | .05 | .09 | |
| SN→ INT | .10 | -.04 | .23 | .07 | .16 | .06 | | ESI→ INT | -.28 | -.48 | -.07 | .10 | **.008** | -.14 | |
| PN→ INT | .78 | .63 | .93 | .08 | **<.001** | .66 | | PN→ INT | .88 | .75 | 1.00 | .06 | **<.001** | .72 | |
| PBC→ INT | .24 | .13 | .35 | .06 | **<.001** | .18 | | INT | | | | | | | .48 |
| INT | | | | | | | .54 | BIOS→ BEH | -.08 | -.31 | .14 | .11 | .46 | -.04 | |
| PN→ HAB | .45 | .31 | .58 | .07 | **<.001** | .36 | | ESI→ BEH | .24 | .03 | .44 | .10 | **.02** | .12 | |
| PBC→ HAB | -.02 | -.13 | .10 | .06 | .75 | -.01 | | PN→ BEH | .23 | .10 | .36 | .07 | **.001** | .19 | |
| AB→ HAB | .31 | .14 | .48 | .09 | **.001** | .17 | | INT→ BEH | .48 | .38 | .60 | .05 | **<.001** | .49 | |
| INT→ HAB | .43 | .31 | .54 | .06 | **<.001** | .41 | | BEH | | | | | | | .46 |
| HAB | | | | | | | .58 | | | | | | | | |
| SN→ PN | .69 | .58 | .79 | .05 | **<.001** | .51 | | | | | | | | | |
| AN→ PN | -.16 | -.29 | -.03 | .07 | **.02** | -.10 | | | | | | | | | |
| AC→ PN | .40 | .25 | .56 | .08 | **<.001** | .24 | | | | | | | | | |
| PBC→ PN | .05 | -.04 | .15 | .05 | .26 | .05 | | | | | | | | | |
| PN | | | | | | | .37 | | | | | | | | |
| AB→ PBC | .50 | .40 | .61 | .05 | **<.001** | .39 | | | | | | | | | |
| PBC | | | | | | | .15 | | | | | | | | |

| **Path** | ***B*** | **LL** | **UL** | ***S.E.*** | ***p*** | **Beta** | ***R²*** | **Path** | ***B*** | **LL** | **UL** | ***S.E.*** | ***p*** | **Beta** | ***R²*** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Giving away or selling unused items: CADM model<br>*CFI* = .96, *TLI* = .91, *RMSEA* = .07 [.05, .09]<br>$\chi2(13) = 42.90$, $p<.001$ | | | | | | | | Giving away or selling unused items: VIP model<br>*CFI* = .98, *TLI* = .97, *RMSEA* = .04 [.02, .06]<br>$\chi2(28) = 52.88$, $p = .003$ | | | | | | | |
| Path | *B* | LL | UL | *S.E.* | *p* | Beta | $R^2$ | Path | *B* | LL | UL | *S.E.* | *p* | Beta | $R^2$ |
| AC→ BEH | .12 | -.02 | .27 | .08 | .10 | .08 | | BIOS→ ESI | .58 | .47 | .70 | .06 | **<.001** | .53 | |
| HAB→ BEH | .48 | .37 | .58 | .05 | **<.001** | .50 | | ESI | | | | | | | .28 |
| INT→ BEH | .15 | .04 | .25 | .05 | **.01** | .15 | | BIOS→ PN | .27 | .08 | .46 | .10 | **.01** | .15 | |
| PBC→ BEH | .02 | -.08 | .12 | .05 | .70 | .02 | | ESI→ PN | .50 | .33 | .67 | .09 | **<.001** | .31 | |
| AB→ BEH | .14 | .01 | .27 | .07 | **.04** | .10 | | PN | | | | | | | .17 |
| BEH | | | | | | | .47 | BIOS→ INT | -.05 | -.25 | .16 | .10 | .66 | -.02 | |
| SN→ INT | .39 | .27 | .51 | .06 | **<.001** | .26 | | ESI→ INT | .09 | -.09 | .28 | .09 | .32 | .05 | |
| PN→ INT | .52 | .42 | .62 | .05 | **<.001** | .47 | | PN→ INT | .79 | .67 | .91 | .06 | **<.001** | .65 | |
| PBC→ INT | .19 | .10 | .28 | .05 | **<.001** | .15 | | INT | | | | | | | .44 |
| INT | | | | | | | .50 | BIOS→ BEH | .05 | -.17 | .26 | .11 | .66 | .02 | |
| PN→ HAB | .33 | .23 | .44 | .05 | **<.001** | .30 | | ESI→ BEH | .12 | -.07 | .32 | .10 | .21 | .07 | |
| PBC→ HAB | -.04 | -.15 | .07 | .05 | .45 | -.03 | | PN→ BEH | .21 | .08 | .33 | .06 | **.001** | .19 | |
| AB→ HAB | .36 | .23 | .48 | .06 | **<.001** | .25 | | INT→ BEH | .34 | .24 | .45 | .05 | **<.001** | .38 | |
| INT→ HAB | .40 | .30 | .50 | .05 | **<.001** | .39 | | BEH | | | | | | | .31 |
| HAB | | | | | | | .52 | | | | | | | | |
| SN→ PN | .74 | .64 | .85 | .05 | **<.001** | .54 | | | | | | | | | |
| AN→ PN | -.02 | -.18 | .14 | .08 | .79 | -.01 | | | | | | | | | |
| AC→ PN | .29 | .16 | .42 | .07 | **<.001** | .19 | | | | | | | | | |
| PBC→ PN | .09 | .01 | .17 | .04 | **.04** | .08 | | | | | | | | | |
| PN | | | | | | | .40 | | | | | | | | |
| AB→ PBC | .50 | .41 | .59 | .05 | **<.001** | .45 | | | | | | | | | |
| PBC | | | | | | | .2 | | | | | | | | |

| **Path** | ***B*** | **LL** | **UL** | ***S.E.*** | ***p*** | **Beta** | ***R*²** | **Path** | ***B*** | **LL** | **UL** | ***S.E.*** | ***p*** | **Beta** | ***R*²** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Purchasing unpackaged goods: CADM model<br>*CFI* = .92, *TLI* = .82, *RMSEA* = .07 [.05, .10]<br>$\chi2(13) = 48.94, p<.001$ | | | | | | | | Purchasing unpackaged goods: VIP model<br>*CFI* = .98, *TLI* = .97, *RMSEA* = .04 [.02, .06]<br>$\chi2(28) = 48.99, p = .008$ | | | | | | | |
| Path | *B* | LL | UL | *S.E.* | *p* | Beta | $R^2$ | Path | *B* | LL | UL | *S.E.* | *p* | Beta | $R^2$ |
| AC→ BEH | -.23 | -.35 | -.12 | .06 | **<.001** | -.20 | | BIOS→ ESI | .58 | .47 | .69 | .06 | **<.001** | .53 | |
| HAB→ BEH | .07 | -.01 | .14 | .04 | .08 | .08 | | ESI | | | | | | | .28 |
| INT→ BEH | -.07 | -.15 | .02 | .04 | .13 | -.08 | | BIOS→ PN | .18 | -.01 | .37 | .10 | .07 | .10 | |
| PBC→ BEH | .15 | .05 | .25 | .05 | **.004** | .15 | | ESI→ PN | .71 | .52 | .90 | .10 | **<.001** | .43 | |
| AB→ BEH | -.04 | -.16 | .09 | .06 | .54 | -.03 | | PN | | | | | | | .24 |
| BEH | | | | | | | .06 | BIOS→ INT | .12 | -.07 | .32 | .10 | .21 | .06 | |
| SN→ INT | .18 | .05 | .31 | .07 | **<.001** | .13 | | ESI→ INT | -.14 | -.33 | .04 | .09 | .13 | -.08 | |
| PN→ INT | .48 | .37 | .58 | .05 | **<.001** | .49 | | PN→ INT | .64 | .53 | .74 | .05 | **<.001** | .59 | |
| PBC→ INT | .21 | .11 | .30 | .05 | **<.001** | .17 | | INT | | | | | | | .34 |
| INT | | | | | | | .38 | BIOS→ BEH | .05 | -.14 | .23 | .10 | .61 | .03 | |
| PN→ HAB | .24 | .15 | .32 | .05 | **<.001** | .24 | | ESI→ BEH | .12 | -.06 | .30 | .09 | .19 | .08 | |
| PBC→ HAB | -.06 | -.16 | .05 | .05 | .30 | -.05 | | PN→ BEH | -.09 | -20 | .01 | .05 | .09 | -.11 | |
| AB→ HAB | .25 | .11 | .39 | .07 | **.001** | .16 | | INT→ BEH | -.01 | -10 | .08 | .04 | .82 | -.01 | |
| INT→ HAB | .42 | .32 | .52 | .05 | **<.001** | .41 | | BEH | | | | | | | .01 |
| HAB | | | | | | | .39 | | | | | | | | |
| SN→ PN | .68 | .58 | .78 | .05 | **<.001** | .49 | | | | | | | | | |
| AN→ PN | .07 | -.07 | .21 | .07 | .34 | .05 | | | | | | | | | |
| AC→ PN | .33 | .19 | .48 | .07 | **<.001** | .22 | | | | | | | | | |
| PBC→ PN | .11 | .02 | .21 | .05 | **.02** | .09 | | | | | | | | | |
| PN | | | | | | | .41 | | | | | | | | |
| AB→ PBC | .35 | .23 | .47 | .06 | **<.001** | .28 | | | | | | | | | |
| PBC | | | | | | | .08 | | | | | | | | |

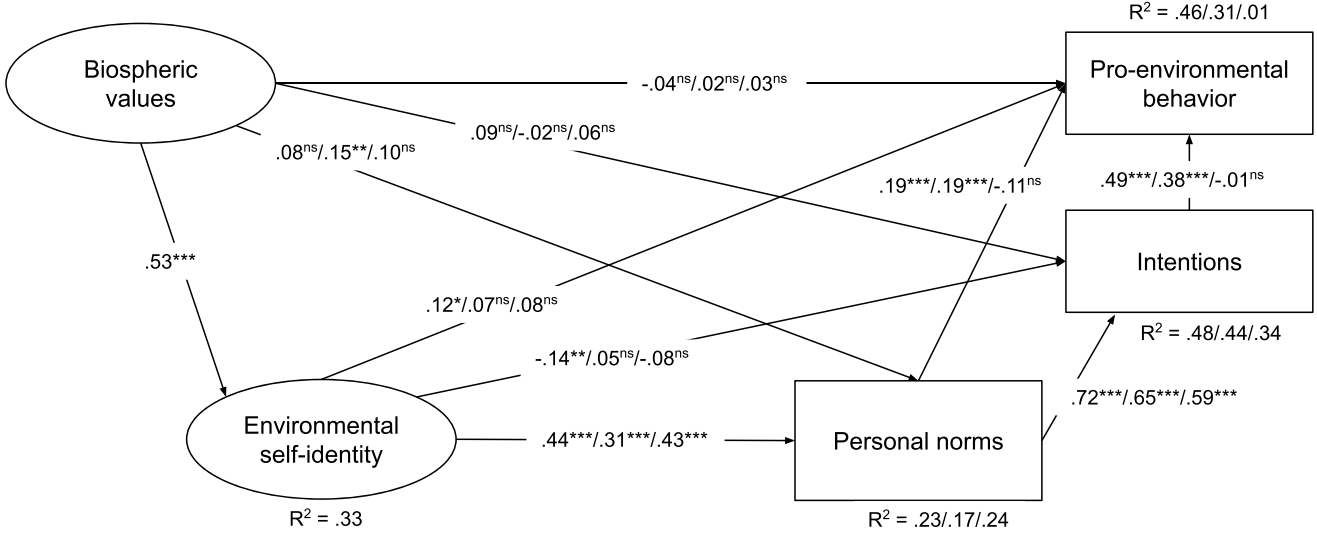
*Notes*. BIOS – biospheric values, ESI – environmental self-identity, SN – social norm, AN – awareness of need, AC – awareness of consequences, PN – personal norm, HAB – habit, INT – intention, PBC – perceived behavioral control, AB – access to behavior and BEH – self-reported behavior. LL – lower 95% confidence interval, UL – upper 95% confidence interval.

**Figure 3** Standardized Regression Paths of the CADM (N = 508)




*Note.* ns - non-significant, * $p < .05$, ** $p < .01$, *** $p < .001$. Coefficients are presented in this order: bag reuse when shopping, giving away or selling unused items, purchasing unpackaged goods.

**Figure 4** Standardized Regression Paths of the VIP (N = 508)




*Note*. ns - non-significant, * $p < .05$, ** $p < .01$, *** $p < .001$. Coefficients are presented in this order: bag reuse when shopping, giving away or selling unused items, purchasing unpackaged goods.

It was not expected that access to behavior and perceived behavioral control will be insignificant predictors in the CADM, however it seems that habit, sharing a lot of variance with both of these variables, overshadows them and emerges as the most contributing predictor for reusable shopping bag use and giving away or selling unused items, but not for purchasing unpackaged goods. Additionally, the insignificant paths of the VIP model between biospheric values and self-reported behaviors provide further support for the linear model structure that implies an indirect path leading from biospheric values toward intention and behavior.



## 5.4 Discussion

We investigated two theoretical approaches: the VIP model (a general model predicting and explaining pro-environmental behavior) and the CADM (a behavior-specific approach in predicting and explaining pro-environmental behavior) to understand adolescents' waste prevention behaviors. Both approaches are effective in explaining waste prevention behaviors. Between the tested models, we found that the components of the VIP model, i.e. biospheric values, environmental self-identity, and the components of the CADM, i.e. social norm, habit, and personal norm (which is shared between the two models) contributed the most in explaining behavior. The predictive power of the VIP varied from 34% to 48%, while the CADM predicted from 47% to 59% of behavioral variance across specific waste prevention behaviors. The CADM consistently outperforms VIP in explained intention and behavior variance, yet this can likely be explained by the principle of compatibility (Fishbein & Ajzen, 2010) and construal-level theory (Rim et al., 2013), which both suggest that behavior specific measures will be more correlated with that specific behavior when compared to more general measures. Ultimately, the two models have different applications, and both are useful for different purposes. The VIP model is more general, thus successfully targeting the components of the VIP model (specifically – environmental self-identity; van der Werff et al., 2014b) would potentially yield desirable behavioral changes in a variety of behaviors, while targeting behavior-specific components of CADM would potentially affect only

the targeted behavior, although behavioral spillover is also probable in some cases (Poškus, 2020).

Constructs of both models – the VIP and CADM – were not related significantly to purchasing unpackaged goods. These results are not surprising since at the time when the study was conducted there was virtually no infrastructure nor attempts that would enable or incentivize consumers to buy unpackaged goods country-wide. Thus, there were no strong preconditions (moral, habitual, or other) for such behavior to form. Yet, interestingly, the CADM component of awareness of consequences was significantly positively related to buying unpackaged goods, indicating a certain degree of awareness of the damage packaging does to the environment. It might be that discourse on sustainability issues worldwide raised adolescents' awareness of consequences of this behavior. Future studies are needed to test whether this is indeed the case.

Our study replicated the results of other studies that find that general (i. e., biospheric values, environmental self-identity) or behavioral specific (i. e., social norm, awareness of consequences, personal norm) normative factors may act as a background in explaining adolescents' waste prevention. Thus, policy makers could employ norm-based interventions aimed at fostering adolescents' waste prevention behaviors.

Only several paths in the tested models are consistently significant among behaviors: the relationships between personal norms and intentions (in the VIP and in the CADM), perceived behavioral control and intentions, social norms and personal norms, awareness of consequences and personal norms, access to behavior and perceived behavioral control (in the CDAM). Relationships between all other paths in both models were inconsistent. For example, the significance of the relationship between intention and behavior differed depending on the behavior. This is likely because some intentions might not necessarily translate in to behaviors because other factor, we did not account for in this study, might affect this relationship.

Habit, consistently with other research (Haustein et al., 2009; van den Broek et al., 2019), revealed itself as the strongest direct contributor to explaining adolescents' waste prevention, thus indicating that waste prevention behaviors are largely automatic rather than conscious behaviors (Gregory & Leo, 2003). Habits are formed in stable environments that have predictable outcomes but are not as easily sustained in environments that change (Fishbein & Ajzen,

2010; Verplanken, 2006). In addition, if we are to break waste habits – we should foster not only the normative factors but also the availability aspect of waste prevention behaviors as well; making behaviors easy and highlighting their necessity and prevalence. However, the results of our studies show that, in general, situational factors had less power in predicting waste prevention behaviors or habits, suggesting that environments in which waste prevention behaviors take place are not favorable enough to break the waste habits or strengthen habits to prevent waste.

For the intention to give away or sell items that are no longer in use, social norm was a rather strong predictor. This social norm might be prevalent because in Lithuania almost 26% of the entire population lives at the risk of poverty (Eurostat, 2022b) and there is a demand for affordable or free stuff. It could also very well be that decades of living in permanent deficit of supplies in a socialist regime could have shaped Lithuanians' tendency to think of items as reusable, repurposable, or to be shared with those in need. These are rough speculations and future studies could test whether this is indeed the case and what motivation lies behind this social norm.



We did not have the possibility to assess actual behavior, which is a common practical limitation (Poškus & Žukauskienė, 2017). We must note that we used single-item measures for the whole of the CADM, while the VIP model had two latent variables, thus requiring us to be cautious in comparing the two models. Additionally, all data presented in this article are cross-sectional, thus preventing us from causal interpretations and limiting us only to conclusions in terms of explained variance. Next, high correlations between awareness of need and awareness of consequences could suggest conceptual and/or empirical overlap, thus this could be clarified in future research. Noteworthy, in Study 1, we found that the CADM model functions substantially better when adding the path between awareness of need and perceived behavioral control (see also X. Xu et al., 2020). Although being aware about the need to change certain behavior could likely lead to a stronger sense of control over changing one's behavior, future studies are needed to explore this relationship further. Furthermore, in Study 1 the relationship between PBC and Habit in the structural model indicates a possible suppressor effect, thus urging us to exercise some caution when interpreting the results. To clarify, in our study, we measured both intentions and behavior simultaneously, using a model

structure that was adapted from previous research (e.g., Haustein et al., 2009) that also measured these variables at the same time point. Ideally, intentions should be measured before behavior, at different time points. However, since our study aimed to use the original model structure without modifications, we followed the same procedure. To ensure comparability between the VIP and CADM models, we made them equivalent and treated intentions in the VIP model in the same manner as they were treated in the CADM. Nevertheless, we acknowledge that this approach has its limitations, and suggest that future studies could address this by exploring different time points for measuring intentions and behavior. On a conceptual level, an evaluation of the VIP and the CADM approaches could best be done in an intervention setting, observing variable change dynamics over time and thus more concretely evaluating to what extent each model explains waste prevention behaviors. Future research could use innovative methods of assessing behavior, such as apps that help individuals keep track of their consumption patterns (e.g., number of plastic bottles bought, number of disposable cups used, number of single-use plastic bags bought).

## 5.5 Conclusions

The VIP and the CADM approaches explain adolescents' waste prevention behaviors significantly. Biospheric values, environmental self-identity, social norm, personal norm, and habit are most significant factors that explain waste prevention behaviors in a sample of Lithuanian adolescents. Both general and behavior-specific approaches can inform policies for adolescents' waste prevention.

# CHAPTER 6

## Are We on The Same Page? Exploring the Relationships Between Environmental Values, Self-Identity, Personal Norms and Behavior in Parent-Adolescent Dyads

The manuscript "Balundė, A., & Perlavičiūtė, G. Are We on The Same Page? Exploring the Relationships Between Environmental Values, Self-Identity, Personal Norms and Behavior in Parent-Adolescent Dyads" presented in Chapter 6 is under the consideration in *Journal of Environmental Psychology* and is currently undergoing the second round of revisions.

## Abstract

Environmental values, self-identity and personal norms are relevant factors explaining individuals' environmentally friendly behaviors. These environmental considerations do not form in solitude, but in social interactions, and as such could be influenced by the family context. Yet, we do not know to what extent environmental considerations of family members are related, such as of parents and their adolescent children. Adolescents in particular could potentially hold different environmental considerations than their parents, because of age-specific tendencies such as rebelling against parents' norms and values and seeking own unique identity. To find out, we conducted a study in a representative sample of adolescents and their parents in Lithuania (N = 492). We found a strong and positive relationship between parents' and their adolescent children's environmental values, self-identity, and personal norms. As expected, the environmental considerations predicted pro-environmental behavior of both parents and adolescents respectively. These findings inform system-oriented interventions aimed at behavior change within a family context. Specifically, since parents and their adolescent children could influence each other's environmental considerations and pro-environmental behavior, interventions could prioritize strategies that foster influences from parents to children and vice versa.

## 6.1 Introduction

Dealing with the environmental crisis requires systematic change (IPCC, 2018) that can be achieved if environmental considerations such as pro-environmental values, self-identities and norms are developed widely in the society (Bouman et al., 2020; Bouman & Steg, 2019). Values, identities, and norms start forming early in life and are influenced by close others, in particular one's family (Manfredo et al., 2017; Olkinuora, 1972; Schwartz, 1977; Xie et al., 2019). In adolescence, the development of values, identities and norms is a critical developmental task, which could be influenced by the family context. On the one hand, adolescents may develop environmental values, identities and norms similar to their parents', resulting in a positive relationship between the environmental considerations of parents and their adolescent children. On the other hand, however, the developmental processes characteristic to adolescence, such as rebelling against the norms and values of parents and seeking own unique identity, could lead to adolescents developing different environmental considerations than their parents. The latter would result in a weak, no, or even a negative relationship between the environmental considerations of parents and their adolescent children. No study so far has examined the relationship between environmental values, self-identity, personal norms and behavior between adolescents and their parents. We address this knowledge gap in the current study. If we will find a positive relationship between parents' and adolescents' environmental considerations, then interventions that aim to promote pro-environmental behaviors could be more effective if they target families rather than individuals.



### 6.1.1 Biospheric Values, Environmental Self-Identity and Personal Norms as Antecedents of Pro-Environmental Behavior

Pro-environmental behavior is aimed at reducing harm for or benefiting the environment (Lange & Dewitte, 2019; Steg & Vlek, 2009). Environmental considerations, in particular biospheric values, environmental self-identity, and personal norms to act pro-environmentally are important antecedents of pro-environmental behavior (Balundė, Perlaviciute, et al., 2020; Ruepert et al., 2016; van der Werff & Steg, 2016). They reflect people's intrinsic motivation to protect the environment and as such can facilitate engaging in many different pro-

environmental behaviors consistently and without necessarily the presence of extrinsic incentives (Bolderdijk et al., 2013; Lindenberg & Steg, 2007).

Values are general goals or ideals in life that guide people's decisions, attitudes, and behavior across different situations and contexts (Schwartz, 2012b). The stronger people's biospheric values, the more they care about the environment and the more motivated they are to engage in a wide range of pro-environmental behaviors (de Groot & Steg, 2009; Steg et al., 2012; Steg & de Groot, 2012), such as recycling (van der Werff et al., 2014b), reducing car use (de Groot et al., 2008), switching to vegetarian diet (Steg et al., 2012), participating in renewable energy projects (van der Werff & Steg, 2016), and engaging in environmental activism (Balundė et al., 2019). Because of their abstract nature, biospheric values typically do not influence behaviors directly, but via intermediate factors, such as environmental self-identity and personal norms to act pro-environmentally.

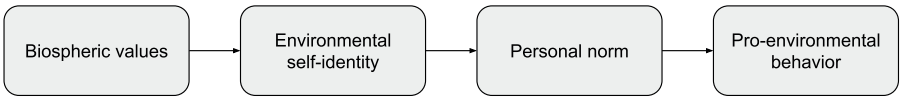
Environmental self-identity is the extent to which a person sees oneself as someone who acts environmentally friendly (van der Werff et al., 2013b, 2014b). The stronger people's biospheric values, the stronger is their environmental self-identity, which in turn motivates many pro-environmental behaviors, such as recycling and environmental activism (Balundė et al., 2019), reduced energy use, and sustainable product choice (van der Werff et al., 2013b).

Personal norms refer to perceived personal moral obligation to act environmentally friendly. Personal norms are behavior-specific constructs rooted in more general constructs, in particular environmental self-identity and biospheric values (van der Werff et al., 2013a, 2013b). Personal norms have been found to result in various pro-environmental behaviors, for example waste prevention behaviors such as bag reuse when shopping, purchasing organic food products, saving electricity at work, participating in renewable energy projects, environmentally-friendly tourist behavior and conserving energy (Balundė, Jovarauskaitė, et al., 2020; Balundė, Perlaviciute, et al., 2020; Ruepert et al., 2016; van der Werff & Steg, 2016; Y. Xu et al., 2019; Zeiske et al., 2020).

There is evidence supporting the entire chain of relationships from biospheric values to environmental self-identity to personal norms and, eventually, to various behaviors that are needed to combat climate change – the so-called Values-Identity-Personal norm model (VIP, Figure 1; Ruepert et al.,

2016; van der Werff & Steg, 2016). Importantly, support for the VIP model has been found for both adults (Ruepert et al., 2016; van der Werff & Steg, 2016) and adolescents (Balundė, Perlaviciute, et al., 2020), as well as for children (Zeiske et al., 2020). Yet, these studies focused on environmental considerations of individuals, rather than the relationships between these considerations among family members. This study is the first to test whether and how the environmental considerations of parents and their adolescent children are related.

**Figure 1** The Value-Identity-Personal norm model




*Note.* Figure adopted from van der Werff and Steg (2016).



### 6.1.2 The Relationship Between Environmental Considerations and Behavior of Parents and Their Adolescent Children

One could expect both - similarities as well as differences - between environmental considerations of parents and their adolescent children. On the one hand, parents and adolescents could directly influence each other's values, identities, norms and behaviors (Friedlmeier & Trommsdorff, 2011; Grønhøj & Thøgersen, 2009; Kandler et al., 2016; Knafo & Galansky, 2008; Roest et al., 2009), resulting in them holding similar environmental considerations. For example, parents could influence their adolescent children's environmental considerations via educating and showing an example (Grønhøj & Thøgersen, 2017). Whereas adolescents could influence their parents by bringing home ideas about the ways to conserve the environment and by practicing pro-environmental behaviors they learned at school (Boudet et al., 2016) or inspired by their peers, for example in climate action groups. On the other hand, adolescents are particularly at the age where they explore various roles in the society (Becht et al., 2016) and seek autonomy from their parents, often by opposing to the values and norms of their parents (Boykin McElhaney & Allen, 2001; Pfeifer & Berkman, 2018). Also, they are highly susceptive to the influences of peers who may propagate other values, identities, and norms than those

held by the parents. This can result in different environmental considerations between parents and their adolescent children. So far, the evidence on the relationships between parents' and their adolescent children's values, identities, and personal norms has been inconclusive, and the relationships between environmental considerations in particular have been understudied, as described below.

Some studies have found a positive relationship between self-transcendence (caring for others and the environment), self-enhancement (caring for personal well-being), openness to change (valuing novelty) and conservation (valuing tradition) values of parents and their children (Doring et al., 2017; Friedlmeier & Trommsdorff, 2011; Roest et al., 2009, 2012). Yet, other studies have found weak relationship between the values of parents and their children (Costigan & Dokis, 2006; Knafo & Schwartz, 2001), including universalism values (that encompass environmental values; Grønhøj & Thøgersen, 2009a). The relationships between parents' and children's values were weak especially when parents and children were involved in different social environments and activities, for example used different media channels, participated in different cultural celebrations and socialized with different groups (see Knafo-Noam et al., 2020 and Kuczynski, Navara, & Boiger, 2011 for a review).

Furthermore, parents may be an important reference group for adolescents in forming their self-identity (Schachter & Ventura, 2008), which would yield positive relationships between self-identities of parents and their adolescent children. Yet, self-identities also form via the identification with other groups outside the family context (Charng et al., 1988). Both parents and adolescents may identify with other groups, such as peers, friends, and leisure groups, which might result in weak relationships between self-identities of parents and their adolescent children. Especially in adolescence, affiliation with other groups beyond the immediate environment (e.g., family) becomes particularly important, when youth enters new roles (e.g., romantic partner, environmental activist, athlete, influencer) (Tarrant, 2002). Furthermore, one way to establish own identity in adolescence is via distancing oneself from or rebelling against parents (Pfeifer & Berkman, 2018), which could lead to even a negative relationship between the environmental self-identities of parents and their adolescent children.

Next, personal norms are the most specific environmental considerations that drive concrete behaviors, and as such could be shared among family members via observations and social learning. Literature suggests that certain moral norms of parents are related to the norms of their adolescent children, such as norms to act pro-socially (e.g., take others' feelings and preferences into consideration) (Gibbs, 2013; Gotschi et al., 2009; Hardy et al., 2008; Schinkel & de Ruyter, 2017). However, adopting different norms might also be the most straightforward way for adolescents to diverge and seek autonomy from their parents, which is a strong urge at this age. Indeed, late adolescents tend to oppose to the norms of their parents (Kuczynski & Parkin, 2007) and seek autonomy (Boykin McElhaney & Allen, 2001). Also, interactions with peers can induce the formation of new norms, different from those prevalent in the family (Biddle et al., 1980; Judy & Nelson, 2000), leading to adolescents' rebellion against the norms imposed on them by their parents. Interestingly, there could be differences in the relationships between different types of norms of parents and children (Biddle et al., 1980), including pro-environmental norms. For example, if parents and children commute together, their personal norms to commute by car could be positively related. Yet some norms might be not related or related negatively, for example, participating in environmental movement, if children are engaged in such activity with their peers, while parents are not. In addition, there might be no or negative relationship between the norms of parents and children if parents preach certain norms, for example, commute by public transportation, but rarely behave accordingly; children may eventually cease to accept such norms, resulting in differences in norms of parents and their children (Grønhøj & Thøgersen, 2012).

Alternatively, if parent-adolescent environmental values are indeed related, their environmental self-identity and personal norms might be related too, because self-identity and personal norms are rooted in biospheric values (Ruepert et al., 2016; van der Werff & Steg, 2016; Zeiske et al., 2020).

Finally, the extent to which parents' and adolescents' environmental considerations are related can affect whether they engage in pro-environmental behaviors to a similar or different extent, as environmental considerations are important predictors of pro-environmental behaviors. Some studies found that there is a strong positive relationship between parents' and their

children's environmental behaviors. Parents' environmental behaviors, such as buying organic or environmentally friendly products, saving electricity and recycling waste were positively strongly related to respective behaviors of their children (Grønhøj & Thøgersen, 2009, 2012; Katz-Gerro et al., 2019; Wallis & Klöckner, 2018); one study found rather weak relationship for electricity saving behavior (Grønhøj & Thøgersen, 2009). In all the above studies parents performed pro-environmental behavior more often than their children. Parents might have more frequent engagement in pro-environmental behavior than their children because adolescents have less control over their behavior than parents do. To conclude, there is mostly a positive relationship between parents' and adolescents' pro-environmental behavior. This could imply that adolescents repeat the behavior observed in parents and/or these behaviors became habitual in the family. Yet the question is to what extent the behaviors are rooted in environmental considerations for both parents and their adolescent children, thus, we will test this.

### 6.1.3 Current Study

All in all, environmental considerations, in particular biospheric values, environmental self-identity and personal norms, are important predictors of individuals' pro-environmental behaviors. New to the literature, we examine to what extent and how environmental values, self-identities, personal norms and behaviors of parents are related to the environmental values, self-identities, personal norms and behaviors of their adolescent children, respectively. On the one hand, family context could potentially be an important basis to strengthen individuals' environmental considerations. On the other hand, especially adolescents may strive to diverge from their parents, by adopting different environmental considerations. This study is the first to test such relationships, within family dyads. Next, for both parents and their children, we test the extent to which environmental considerations are associated with their own respective pro-environmental behaviors. Together, the findings will provide insights into the effective potential of targeting environmental values, self-identity and norms of parents and their adolescent children as a systematic approach to increase pro-environmental behavior within societies (Boudet et al., 2016; Dubois et al., 2019; Grønhøj, 2006; Manfredo et al., 2017).

## 6.2 Method

### 6.2.1 Participants and Procedure

The participants were a representative sample of adolescents and one of their parents or guardians (hereafter, "parents") in Lithuania, from all its (ten) municipalities with representative proportions of participants from rural and urban areas. The survey was conducted by a professional survey company *Baltic-Surveys, Ltd*, in April-May 2018. It took approximately 60 minutes for participants to fill in the questionnaire. In total, 508 adolescent-parent dyads participated in the study. Responses of 16 adolescent-parent dyads were excluded from the analysis because a substantial amount of information on key variables was lacking for adolescents. The final sample includes 492 adolescent-parent dyads. Among adolescents, 251 (51%) were male and 241 (49%) were female; among parents, 122 (24.8%) were male and 370 (75.2%) were female. The age of adolescents ranged from 13 to 17 ($M$ = 15.11, $SD$ = 1.39) and of parents from 19 to 76 ($M$ = 42.67, $SD$ = 6.68). Among parents, 465 (94.5%) were mothers or fathers, 19 (3.9%) grandmothers or grandfathers, and 8 (1.6%) other legal guardians.

Income and education data were retrieved from parents. Specifically, 3.9% indicated that they hardly earn for food; 21.7% indicated that they earn enough for food, but barely for clothing; 45.9% indicated that they earn enough for food, clothing and have extra savings, but cannot purchase more expensive goods such as TV; 23.2% indicated that they can afford not only basics, but also some more expensive purchases such as TV, but not real estate; 1.2% indicated that they can allow themselves virtually everything; and 4.1% did not answer[30]. Higher education was completed by 55.8% of parents, and 5.7% were unemployed.

### 6.2.2 Ethics

The study was approved by the research ethics committee at the ANONYMIZED University (protocol number: Nr. 4/-2020). Verbal informed consent was obtained from both adolescents and parents. Participants were informed that

30 We report subjective assessment of income, because it differs across countries what people can afford for a certain level of income and because 30.9% of the participants did not answer questions about objective income.

they are not obliged to participate even if they gave consent for participation. Adolescents could refuse to participate even if their parents gave consent to participate. Participants could withdraw from the study at any stage and were informed that all their data will be handled in accordance with stringent ethical standards. The stated aim of the research was to explore the determinants of and attitudes towards pro-environmental behavior in Lithuania. No data was gathered that would allow to identify participants' identity. Participants received contact information to consult in case of questions about the study. After the verbal introduction, they received a written description of the study. Participants were made aware that if they start filling in the questionnaire, it means they are giving their consent to participate.

### 6.2.3 Analytic Strategy

We used the 23rd version of SPSS to calculate descriptive statistics, mean comparison, correlations and to perform confirmatory factor analysis. First, to investigate the discriminant validity of biospheric values and environmental self-identity, we used a confirmatory factor analysis, the Oblique Multiple Group method (OMG; Nunnally, 1978). This strategy is commonly used to test the discriminant validity of biospheric values and environmental self-identity (Steg et al., 2012; van der Werff et al., 2013b, 2014b). The OMG tests to what extent the data supports the a-priori assignment of the items to the respective subscales (Stuive et al., 2008). Next, we tested the extent to which biospheric values, environmental self-identity, personal norms and pro-environmental behavior of adolescents were related to the respective variables of their parents, by computing respective correlations. In addition, we compared the average levels of parents' and adolescents' environmental considerations and behavior by employing Wilcoxon signed-rank test.

We used Structural Equation Modeling (SEM) in Mplus 8.4 (Muthén & Muthén, 2017) to investigate the relationships between the environmental considerations and pro-environmental behaviors, testing the VIP model (van der Werff & Steg, 2016). Specifically, we tested whether adolescents' and their parents' biospheric values are related to their own various pro-environmental behaviors via environmental self-identity and personal norms, for both . We applied the robust unweighted least squares estimator (ULSMV) together with the theta parameterization, which is most suitable for models that contain

ordinal variables, such as personal norms and pro-environmental behaviors (Muthén, 1993; Muthén & Asparouhov, 2002). We used the following model fit indices to evaluate the extent to which each proposed model fits the data: *RMSEA* (the Root Mean Square Error of Approximation), *CFI* (the Comparative Fit Index), *TLI* (the Tucker-Lewis Index) and chi square (χ2). The fit of the model is considered acceptable when *RMSEA* ≤ 0.06, *CFI* ≥ 0.90, *TLI* ≥ 0.90, and when the chi square (*χ2*) value is not significant (Little, 2013). Noteworthy, the chi square indice may result in rejecting acceptable models because the indice is sensitive to sample peculiarities. It is therefore most important to consider *CFI* and *TLI* values, which are the derivatives of chi square when controlling for sample size (Hooper et al., 2008). We used confidence intervals to report significance levels of SEM (Schreiber et al., 2006). The sample size was determined by following the recommendations for SEMs suggesting that 5 to 1 ratio of observations to parameters is a minimum requirement for valid models (Kline, 2011). In this study the most complex model contains 33 parameters, thus requiring a sample size no less than 165. The sample size of the current study is 492, and therefore regarded as sufficient.



### 6.2.4 Measures

In order to reduce possible order effects (Podasakoff et al., 2003), the order of items within the scales were upturned for half of the participant dyads. Established instruments were used to measure participants' biospheric values, environmental self-identity and personal norms to act pro-environmentally. Descriptive statistics, properties of the instruments used and mean comparison of parents' and adolescent children's variables[31] are provided in Table 1. The measure of pro-environmental behavior was constructed for this study based on the literature (e.g., Kaiser & Wilson, 2004).

Values were measured with a short version of the Schwartz's (1992) value scale (de Groot & Steg, 2007a; Steg et al., 2012). Participants indicated on a five-point scale to what extent different values are important guiding

31 Mean comparison indicated that parents had stronger biospheric values, personal norms and behavior than their adolescent children (Table 1), except purchasing unpackaged goods. Adolescents purchased unpackaged goods more often than their parents. Yet median comparison shows that these differences are rather small.

principles in their lives. The scale ranged from 1 *opposed to my guiding principles* to 5 *of supreme importance*. The biospheric values scale consisted of four items (e.g., "Protecting the environment: preserving nature"). The OMG analysis showed that biospheric values could be empirically distinguished from altruistic, egoistic and hedonic values in both parents' and adolescents' samples (Supplementary material 1[32]). In all models that measure the relationship between environmental considerations and behavior for adolescents, the item "Respecting the earth: harmony with other species" did not function properly[33], specifically, it had a low estimate of a factor loading. When this item was removed from the analyses, the model fit indices improved. To have equivalent models, the item was also removed from the scale of biospheric values of parents[34]. This did not affect the reliability of the scale for neither parents nor adolescents.

Environmental self-identity was measured with three items (van der Werff et al., 2013b). Participants indicated on a Likert-type scale, varying from 1 *totally disagree* to 5 *totally agree* to what extent they consider themselves as a person who acts environmentally friendly (e.g., "I see myself as an environmentally-friendly person"). In the OMG analysis, environmental self-identity could be empirically distinguished from biospheric values (Supplementary material 2). The original VIP model was amended with the covariance path between the

32 Supplementary materials are available at the Open Science Framework page https://osf.io/s8crk/?view_only=7c84ad1be7f1431c961d06dbe3c3f82a.

33 The OMG showed that the four biospheric values items form a distinct cluster from other values for parents and their adolescent children, as derived from theory; and the scale reliability estimated with Cronbach's alpha was sufficient. Yet, the SEM analysis indicated that this item does not function properly in the overall model for adolescents, and it was therefore removed from further analysis. In the current study, the VIP model could only be replicated when removing this item. There might be a number of reasons why this is the case, yet we cannot identify them from the current data. Future studies are needed to test whether this is the case for other adolescents' samples too or only for the current sample.

34 Excluding the item from the parents' data did not affect the relationships between the VIP model variables.

environmental self-identity items[35] "I am the type of person who acts environmentally-friendly" and "I see myself as an environmentally-friendly person". The covariance indicates that these two items are related not only because they represent one construct of environmental self-identity, but also some external factors might strengthen their relationship[36].

Personal norms to engage in different pro-environmental behaviors were each measured with one item, based on previous studies (van der Werff et al., 2013a, 2013b). Participants indicated on a five-point scale ranging from 1 *totally disagree* to 5 *totally agree* to what extent they feel morally obliged to perform different pro-environmental behaviors, for example, "I feel morally obliged to purchase organic food products".

Participants indicated how often during the period of the past four weeks they engaged in different pro-environmental behaviors, on a scale from 1 *never or almost never* to *always or almost always*. Each behavior was measured with a single item, for example, "I purchased local food products" and "I ate vegetarian food". We included single items for each personal norm and behavior in the analysis because we aimed to explore to what extent environmental considerations can explain specific pro-environmental behaviors, as opposed to explaining the general tendency to act pro-environmentally.



35 It is important to consider modification indices, because they suggest adjustments to theoretical model that are relevant for the certain dataset. Datasets vary therefore it is likely that theory will not match the sample exactly. Modification indices points out which adjustments are needed to theoretical model to match the sample. In this case neither the model nor the relationships between variables were affected when covariance was added.

36 We cannot say from the current data what are these factors. It might be item wording or peculiarities of the parents' sample. Future studies could clarify that. Model fit investigation indicated that this path increases the overall fit of the model.

**Table 1** Properties of the Measurement Instruments, Descriptive Statistics and Mean Comparison of Parents' and Adolescents' Environmental Considerations and Behavior (Wilcoxon Signed-Rank Test)

| | Parents/ Adolescents | | | | | | |
|---|---|---|---|---|---|---|---|
| **Scale** | **Cronbach's *α*** | ***M*** | ***SD*** | ***Mdn*** | ***Z*** | ***p*** | ***r*** |
| Biospheric values | .88/.87 | 4.08/4.02 | .67/.67 | 4.00/4.00 | -2.58 | **.01** | .08 |
| Environmental self-identity | .84/.85 | 3.60/3.58 | .73/.69 | 3.67/3.67 | -.89 | .37 | .03 |
| Personal norm | | | | | | | |
| to purchase organic food products (1) | - | 2.71/2.69 | .96/.97 | 3.00/3.00 | -.32 | .75 | .01 |
| to use reusable bags for shopping (2) | - | 3.34/3.09 | 1.02/1.02 | 3.00/3.00 | -5.00 | **.000** | .16 |
| to purchase local food products (3) | - | 2.98/2.82 | .97/.99 | 3.00/3.00 | -3.02 | **.003** | .10 |
| to eat vegetarian food (4) | - | 2.24/2.21 | 1.04/1.06 | 2.00/2.00 | -.39 | .69 | .01 |
| to sell or give away unused items (5) | - | 3.19/2.99 | 1.06/1.05 | 3.00/3.00 | -3.60 | **.000** | .11 |
| to purchase unpackaged goods (6) | - | 2.98/2.78 | .99/.98 | 3.00/3.00 | -4.10 | **.000** | .13 |
| to refuse to drink bottled water (7) | - | 2.84/2.70 | .98/.97 | 3.00/3.00 | -2.82 | **.005** | .09 |
| to bring back deposit plastic (8) | - | 3.69/3.54 | 1.07/1.08 | 4.00/4.00 | -2.72 | **.007** | .09 |
| to recycle non-refundable plastic (9) | - | 3.50/3.33 | 1.07/1.05 | *4.00/3.00* | -3.72 | **.000** | .12 |
| Behavior | | | | | | | |
| Purchasing organic food products (1) | - | 2.56/2.20 | .99/1.03 | *3.00/2.00* | -6.29 | **.000** | .20 |
| Using reusable bags for shopping (2) | - | 3.39/2.67 | 1.23/1.32 | *4.00/3.00* | -9.64 | **.000** | .31 |
| Purchasing local food products (3) | - | 3.32/2.92 | .92/1.09 | 3.00/3.00 | -7.77 | **.000** | .25 |
| Eating vegetarian food (4) | - | 1.72/1.69 | .96/1.02 | 1.00/1.00 | -.85 | .40 | .03 |
| Selling or giving away unused items (5) | - | 2.97/2.60 | 1.21/1.23 | 3.00/3.00 | -6.10 | **.000** | .19 |
| Purchasing unpackaged goods (6) | - | 3.07/3.34 | 1.04/1.09 | 3.00/3.00 | -5.34 | **.000** | .17 |
| Refusing to drink bottled water (7) | - | 3.05/2.88 | 1.16/1.17 | 3.00/3.00 | -3.50 | **.000** | .11 |
| Bringing back deposit plastic (8) | - | 4.12/3.65 | 1.04/1.28 | 4.00/4.00 | -7.66 | **.000** | .24 |
| Recycling non-refundable plastic (9) | - | 3.49/3.02 | 1.25/1.32 | *4.00/3.00* | -7.95 | **.000** | .25 |

*Note. p* values are significant at the level .05. *M* – mean, *Mdn* – median, *SD* – standard deviation, *Z* – standard score for parent and adolescent variables' rank mean comparison, *r* – effect size.

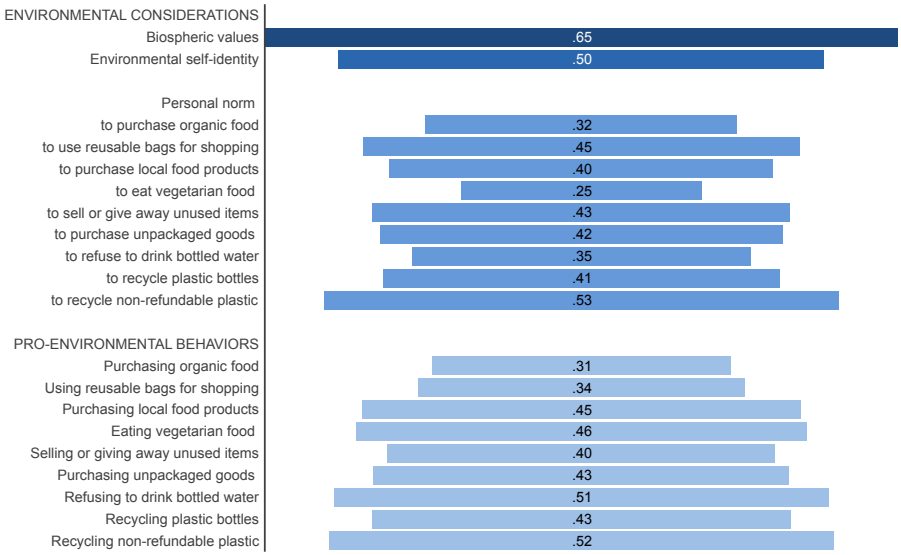
## 6.3 Results

### 6.3.1 The Relationship Between Parents' and Adolescents' Environmental Considerations and Behavior

We tested the extent to which environmental considerations and pro-environmental behaviors of parents are related to environmental considerations and pro-environmental behavior of their adolescent children. We found that parents' biospheric values, environmental self-identity, personal norms and various pro-environmental behaviors were positively related to the biospheric values, environmental self-identity, personal norms and various pro-environmental behaviors of their adolescent children (Figure 2). The strongest relationship was found for biospheric values. The relationship between other environmental considerations (i.e., environmental self-identity and personal norms) and pro-environmental behaviors varied from strong to very strong (.25 <= *r* <= .53).



**Figure 2** Funnel Plot for Correlations Between Adolescents' and Their Parents' Biospheric Values, Environmental Self-Identity, Personal Norms and Pro-Environmental Behavior




*Note.* All correlations are significant at $p$=.01; different shades represent different constructs, namely biospheric values, environmental self-identity, personal norms and behavior. Full correlation matrix is presented in Supplementary material 4.

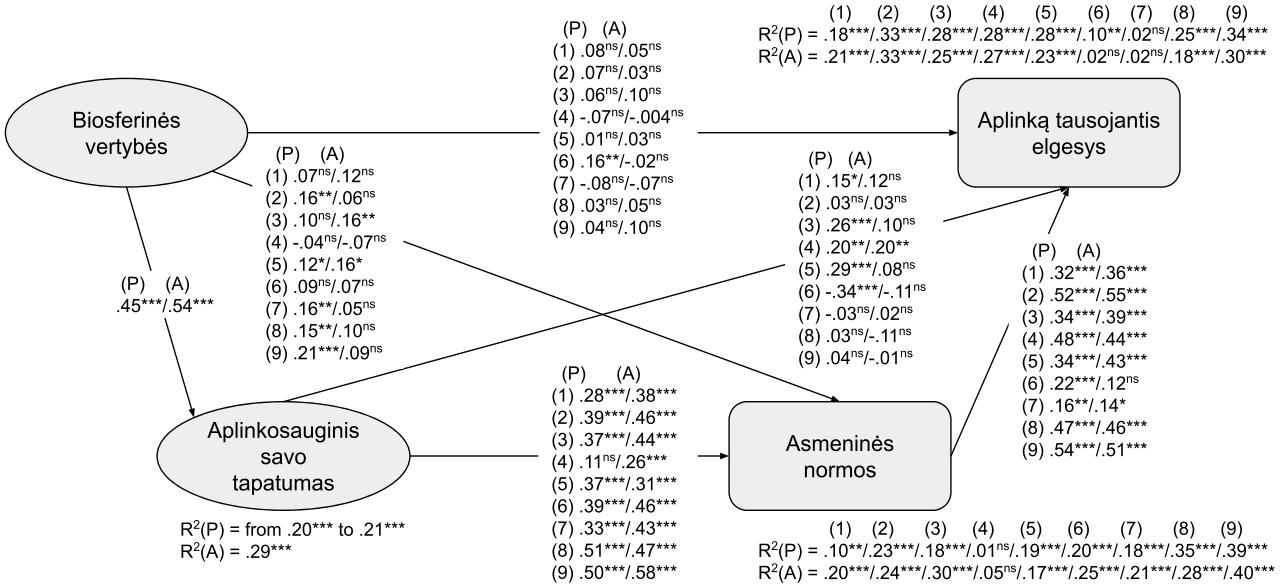
### 6.3.2 The Relationship Between Environmental Considerations and Behavior of Parents and Adolescents

In line with the VIP model, biospheric values were directly positively related to environmental self-identity, in both parents' and adolescents' samples[37]. Specifically, biospheric values explained 20% to 21% of the variance in environmental self-identity of parents and 29% in environmental self-identity of adolescents. Environmental self-identity was directly positively related to personal norms to act environmentally friendly in both samples. One exception was the personal norm to eat vegetarian food: environmental self-identity was not significantly related to this personal norm in the parents' sample, and it did not explain a significant amount of variance in this personal norm in both samples. For all the remaining personal norms, environmental self-identity explained 10% to 39% of the variance for parents and 17% to 40% for adolescents. Next, personal norms were directly positively related to respective pro-environmental behaviors in both samples. Two exceptions were refusing to drink bottled water and purchasing unpackaged goods behaviors: the respective personal norms did not explain a significant amount of the variance in refusing to drink bottled water for both parents and adolescents (even though the relationship was positive and significant) and purchasing unpackaged goods for adolescents. For all the remaining pro-environmental behaviors, personal norms explained 10% to 34% of the variance in the respective behaviors for parents and 18% to 33% for adolescents (Figure 3).

Biospheric values were related to the nine pro-environmental behaviors indirectly via environmental self-identity and personal norms, for both parents and adolescents. The full chain of the relationships was not obtained only for eating vegetarian food for parents (i.e., non-significant relationship between environmental self-identity and the personal norm) and purchasing unpackaged goods for adolescents (i.e., non-significant relationship between the personal norm and the behavior) (Supplementary material 3).

37 Three behaviors (i.e., bag reuse when shopping, giving away or selling unused items and purchasing unpackaged goods) and the VIP relationship for adolescents has already been reported in a paper ANONYMIZED.

**Figure 3** Standardized Regression Coefficients of the Direct Model Paths for Environmental Considerations and Nine Pro-Environmental Behaviors for Adolescents and Their Parents




*Note. ns* – non-significant, **p* < .05, ***p* < .01, ****p* < .001, $R^2$ – explained variance. Each coefficient represents nine behaviors of adolescents (A) and their parents (P), namely: (1) purchasing organic food products, (2) using reusable bags for shopping, (3) purchasing local food products, (4) eating vegetarian food, (5) selling or giving away unused items, (6) purchasing unpackaged goods, (7) refusing to drink bottled water, (8) bringing plastic bottles to the deposit station and (9) recycling non-refundable plastic.

## 6.4 Discussion

Pro-environmental behavior is influenced by environmental considerations, namely biospheric values, environmental self-identity and personal norms. Families could provide an important basis for cultivating these environmental considerations by reciprocally strengthening them between parents and their adolescent children. Yet, the question remains whether and to what extent biospheric values, environmental self-identity, personal norms and environmental behaviors are related between parents and their adolescent children. Adolescents' tendency to seek autonomy, explore their identity and oppose to moral standards of their parents could hinder this relationship. We conducted a representative survey with 492 parent-adolescent dyads in Lithuania. The results confirmed that for both samples environmental considerations are important antecedents of pro-environmental behavior. More importantly, and new to the literature, we found that environmental considerations are positively and strongly related between parents and their adolescent children, suggesting that system-orientated interventions that target families could be an effective way to promote many pro-environmental behaviors widely in the society.

We found that biospheric values, environmental self-identity and personal norms are related to various pro-environmental behaviors (e.g., recycling non-refundable plastic, purchasing organic food products) among both parents and their adolescent children. Extending previous evidence that the VIP model explains pro-environmental behavior at work (Ruepert et al., 2016) and adopting rebewable smart energy systems (van der Werff & Steg, 2016), the current findings show that the VIP model can also explain households' everyday pro-environmental behaviors. In addition, current findings strengthen the initial evidence that environmental considerations explain pro-environmental behaviors of adolescents (Balundė, Perlaviciute, et al., 2020). There were a few exceptions, though. Parents' environmental self-identity did not explain their personal norm to eat vegetarian food. Also, adolescents' personal norm to purchase unpackaged goods did not explain their respective behavior. This suggests that the exact pathway from environmental considerations to pro-environmental behavior might vary across different types of behaviors. Indeed, different behaviors could be determined by different contextual or other

factors that are unique to the specific behavior (Stern, 2000). For example, the gap between parents' environmental self-identity and personal norms to eat vegetarian food could be determined by cultural preferences to eat meat. Only 6.3% adult participants in the current study were vegetarians. In Lithuania in particular adopting a vegetarian diet might not yet be a common way to act upon one's environmental considerations, and social norms may not be in favor of being a vegetarian, which together could inhibit the relationship between environmental self-identity and eating vegetarian. Similarly, the gap between adolescents' personal norm to purchase unpackaged goods and the behavior could occur because other factors might have a stronger effect on this behavior (Marken & Hörisch, 2019). For example, it is most likely that adolescents are not responsible for grocery shopping, and the products that they do purchase might be not accessible in unpackaged form (e.g., lunch, drinks, and snacks).



Novel to the literature, we showed that environmental considerations of parents and their adolescent children are positively related. First, there was a strong positive relationship between biospheric values of the two groups. These findings are in line with the findings from basic human values studies indicating positive relationship between the values of parents and their children (Doring et al., 2017; Friedlmeier & Trommsdorff, 2011; Kandler et al., 2016). A previous study on the relationship between parents' and adolescent children's universalism values (that encompass environmental values) in Denmark found a positive, but relatively weak relationship ($r = .18$; Grønhøj & Thøgersen, 2009b) compared to the findings of the current study ($r = .65$). Given that Denmark is considered to be a front-runner in environmental policies - while Lithuania is only starting to implement environmental policies (OECD, 2019) – one could expect that particularly in Denmark environmental issues are more discussed in families, leading to a stronger relationship between biospheric values of family members. It might be that the results of our study are affected by the increased debate on climate change in recent years in Lithuania. Indeed, climate change-related social movements lead to seeking information about environmental issues (Sisco et al., 2021). This could potentially intensify the discussion between parents and their adolescent children at home and thus potentially lead to stronger relationships between parents' and adolescent children's values. Furthermore, in Denmark, adolescents may be discussing climate issues not only in families but also – or even

more – with peers and at school. This could result in stronger relationships with values of other significant others, including teachers and friends, than parents. Whereas in Lithuania the environmental education has not advanced yet and families may be one of the main platforms for climate-related discussions. Future studies could test the extent to which environmental values of parents and children are related across countries and cultures, additionally exploring the factors that may influence the strength of these relationships.

Next, we found a strong positive relationship between parents' and adolescents' environmental self-identity, personal norms and behaviors. Thus, while adolescents seek autonomy from their parents and tend to oppose to their norms as well as explore alternative self-identities outside their close environment (Katz-Gerro et al., 2019; Kuczynski & Parkin, 2007), we still see that adolescents' environmental considerations and behaviors are strongly related to those of their parents. Strong relationship might be determined by the family socialization processes, when parents set the moral standards for their adolescent children's behavior. These results show that environmental self-identity, norms to act environmentally friendly and environmental behaviors are shared between parents and adolescent children, suggesting that environmental considerations and behaviors of parents and their adolescent children could be targeted in interventions, as outlined below.

Education about nature (Liefländer et al., 2013; Wijngaarden, 2019) and nature-based learning (Collado et al., 2013) could strengthen people's environmental considerations and behavior. Based on our findings, we suggest that environmental education could target both adolescent's and their parents' environmental considerations and behavior via formal or non-formal education that (indirectly) involves parents (D'Amore, 2016). Studies show that environmental education programs targeted at children's environmental knowledge, motivation and behavior increased their parents' dissatisfaction with environment conditions in their neighborhood (Legault & Pelletier, 2000). Similarly, child-targeted energy saving behavior intervention increased parents' respective behavior (Boudet et al., 2016). Also, children's environmental education improved parents' household water-management behavior (Damerell et al., 2013) and increased parents' knowledge on endangered wildlife species (Vaughan et al., 2003). The effects of such interventions on parents' behavior could be strengthened, for example, via involving parents

in helping their children to do intervention-related homework (Boudet et al., 2016). Homework could include tasks such as weekly weighing household's plastic waste and encouraging to reduce single-use plastic in the household. Next, environmentally friendly practices within household stem from family members' reciprocal influences on each other (Grønhøj, 2006). Therefore, household interventions that target adults' environmental behaviors (see Varotto & Spagnolli, 2017 for a review) could also include adolescents. For example, parents and adolescent children could together monitor how often they use single-use bags for shopping and set a plan to change this behavior; or adolescent children together with their parents could decide on and implement electricity saving plans. Targeting both parents and children could be done by creating an opportunity to discuss and set goals and commitments to conserve the environment together. Third, studies show that reminding people of their past environmental behaviors strengthens their environmental self-identity (Fanghella et al., 2019; Lacasse, 2016; van der Werff et al., 2014a, 2014b). Interventions that target families' environmental considerations could employ this strategy by letting family members to recall environmentally friendly behaviors they performed together. Future studies could test the effectiveness of these different strategies to encourage environmentally friendly behaviors in households.



There are several limitations that could be addressed in future studies. First and foremost, the cross-sectional design of the study does not allow to identify the direction of the relationship, namely, whether parents influence their children's environmental considerations and behavior or vice versa. It might also be a reciprocal process – adolescent children and parents influence each other's environmental considerations and behavior. Future studies could test these relationships at several time points. This would enable to observe how influences between family members form and how parents and children influence each other's environmental considerations and behavior across time. In addition to this, manipulating environmental considerations of children (or parents) in experimental settings (e.g., environmental education; Wijngaarden, 2019)) and testing the extent to which these manipulations have an effect on parents' (or children's) environmental considerations, would enable insights into how environmental considerations are transmitted between parents and children and in which direction. Second, we demonstrate that the relationship

between environmental considerations and behaviors of parents and their adolescent children is strong, but we did not test factors that influence this relationship. The strength of the relationship between parents' and children's environmental considerations could be affected by multiple factors, for example specific life events. Studies suggest that environmentally friendly decisions and behaviors in family context are dynamic, driven by accidental (e.g., illness of a family member) and planned (e.g., birth of a child, changes of work or school location) life events (Shirani et al., 2017). Future studies could test to what extent certain life events affect the strength of the relationship between parents' and children's environmental considerations and behavior. Studies also suggest that there is a positive relationship between autonomy-supporting parental practices and adolescents' motivation to act environmentally friendly (Grønhøj & Thøgersen, 2017). Future studies could test the extent to which various parental practices affect the strength of the relationship between parents' and their adolescent children's environmental considerations and behaviors. Third, parents of adolescents could freely decide which of them will participate in the current study. It could be that the parent who chose to participate was the one who is most closely emotionally related to the child and therefore could have more similarities with the child in terms of environmental considerations and behaviors, or that parents with stronger environmental considerations participated. When possible, future studies could include both parents or randomly assign one of them to participate. Fourth, in this study we relied on self-reported pro-environmental behavior. Future studies could test the extent to which environmental considerations explain actual environmental behaviors in a family context and to what extent actual behaviors of parents and children are related.

To conclude, our study provides the first evidence that parents' and their adolescent children's biospheric values, environmental self-identity, personal norms to act pro-environmentally and pro-environmental behaviors are strongly and positively related. Even though adolescents seek autonomy and tend to oppose to norms and values of their parents, we nevertheless demonstrate that this does not hinder the strength of the relationship between environmental considerations and behavior of parents and their adolescent children. The results propose that systematic interventions that target environmental considerations in a family context could be an effective way to promote

pro-environmental behaviors on a large scale. We therefore recommend future directions for policies.

# CHAPTER 7

## General Discussion

## 7.1 Introduction

To combat the global climate crisis, it is essential that people adopt many pro-environmental behaviors. In this dissertation, we build on and extend previous research that explored the role of environmental considerations in explaining multiple pro-environmental behaviors. Specifically, whereas prior research has focused on adults in WEIRD countries, we tested to what extent general environmental considerations, namely biospheric values and environmental self-identity, can motivate pro-environmental behavior in less studied contexts and samples, namely in Lithuania and among adolescents. Lithuania is considered as economically developed and educated country, yet it faces various social (e.g., high suicide rates), demographic (e.g., drain of the intellectual capital) and economic (e.g., high proportion of population lives at the risk of poverty) problems not typical to WEIRD countries. People's focus on these other issues might obstruct the influence of environmental considerations on their pro-environmental behavior. Next, adolescents' pro-environmental behavior might be particularly influenced by a variety of other factors, such as peer pressure, which raises a question to what extent their pro-environmental behavior is driven by their environmental considerations.

### 7.1.1 Distinguishing Environmental Self-Identity from Other Constructs Representing Human-Environment Relations

We analyzed the conceptual and empirical distinction between environmental self-identity and other constructs that describe human-environment relations, namely connectedness with nature (Schultz, 2002) and environmental identity (Clayton, 2003). Environmental self-identity is rooted in biospheric values – hence can intrinsically motivate people's pro-environmental behavior. At the same time, environmental self-identity can also be affected by past pro-environmental behavior and as such can be malleable, for example by reminding people of their past pro-environmental actions (van der Werff et al., 2014b). These characteristics make environmental self-identity a very interesting target for interventions. Given that similar constructs – connectedness with nature and environmental identity – have been distinguished as important predictors of pro-environmental behavior, we aimed to clarify the similarities and differences between these constructs.

The results of a systematic literature review and empirical analysis indicated differences as well as similarities between constructs representing human-environment relations (Chapter 2). Systematic literature review revealed that connectedness with nature, environmental identity and environmental self-identity all define people's self-concept in relation to the environment. Yet, environmental self-identity is a distinct theoretical construct from connectedness with nature and environmental identity. Specifically, environmental self-identity represents the extent to which one sees themselves as someone who acts pro-environmentally (van der Werff et al., 2013b). Whereas connectedness with nature represents the extent to which one perceives themselves as being a part of nature (Schultz, 2002) and environmental identity refers to one's feeling of being connected to certain parts of the natural environment (Clayton, 2003). Different definitions of these constructs point out to possibly different motivations to engage in pro-environmental behaviors. Specifically, if people feel connected to (parts of) nature (i.e. connectedness with nature, environmental identity), they may engage in pro-environmental behaviors because they want to protect nature as part of their identity. If, however, people see themselves as someone who acts pro-environmentally, they may act pro-environmentally in order to be consistent with this self-perception, irrespective of whether they see themselves as part of nature or not. Similarly, the empirical analysis revealed that all these constructs are related, but also – to a certain extent – distinct: there was a strong positive relationship between the measures of connectedness with nature and environmental identity, and a less strong (although still relatively strong) positive relationship between measures of connectedness with nature and environmental self-identity (Chapter 2). Thus, whereas strong relationship between connectedness with nature and environmental self-identity could be because they both define people's self-concept in relation to the environment (Schultz, 2002), both our theoretical and empirical analysis point out to these constructs being distinct from each other, which might have different implications for pro-environmental behavior.

A recent meta-analysis on the relationship between constructs representing human-environment relationship and pro-environmental intentions and behavior found, that environmental self-identity was slightly stronger related to pro-environmental intentions and behavior than connectedness with nature (Vesely et al., 2021).This raises a question how and when these

different constructs best predict pro-environmental behavior. For example, connectedness with nature could predict particularly behaviors that are directly related to nature conservation, as people may want to protect the natural environment if they feel part of it. While environmental self-identity could predict a wider spectrum of pro-environmental behaviors because people with strong environmental self-identity may want to do the right thing, but not because they feel part of nature. There is evidence indeed that people conserve the environment not only for biophilic reasons, but also because of the need to ensure one's health and survival and because of altruistic reasons – the need to protect nature for future generations (Gustafson et al., 2022). Thus, we suggest that environmental self-identity could be most relevant for understanding many people's pro-environmental behavior, yet future research could test whether and which various pro-environmental behaviors are more likely to be explained by environmental self-identity and which - by connectedness with nature. Furthermore, environmental self-identity could potentially mediate the relationship between connectedness with nature and pro-environmental behavior. One study showed that connectedness with nature and biospheric values are strongly related (Martin & Czellar, 2017), suggesting that both could represent more general environmental concerns and influence behavior through environmental self-identity. Future studies could test this possibility and examine what this means for promoting people's different pro-environmental behaviors.

### 7.1.2 The Relationship between Environmental Considerations and Multiple Behaviors in Lithuania and Among Adolescents

The key question of this dissertation was to what extent can general environmental considerations, namely biospheric values and environmental self-identity, explain pro-environmental behavior in Lithuania and among adolescents. Studies in WEIRD countries and among adults have shown that environmental considerations explain a wide range of pro-environmental behaviors (e.g., van der Werff et al., 2014b). Initial evidence from non-WEIRD countries suggests that biospheric values explain pro-environmental behaviors among adults (de Groot et al., 2012; Jakovcevic & Reyna, 2017; Jakovcevic & Steg, 2013; Sahin, 2013; Ünal et al., 2019). The evidence is limited, however, because these studies did not test the role of environmental self-identity in

the relationship between values and pro-environmental behavior, whereas environmental self-identity can be a critical factor for interventions aimed at promoting pro-environmental behavior, because it is more malleable than biospheric values (see section 1.1.1). To add, these studies did not test multiple behaviors. As regards adolescents, most studies examining the relationships between environmental considerations and behavior have focused on adults, with limited to no insights about the generalizability of these findings to other age groups.

In this thesis, we found evidence that environmental considerations can explain multiple pro-environmental behaviors in Lithuania, both among adults (Chapter 3 and 6) and adolescents (Chapter 4, 5 and 6). Besides environmental issues, Lithuania faces various social, demographic and economic issues, including social inequalities, drain of the intellectual capital, population decline in rural areas and many people living at the brink of poverty and in social exclusion (Eurostat, 2022b, 2022a; Okunevičiūtė-Neverauskienė & Pocius, 2019; OSP, 2020a, 2022; Pociūtė-Sereikienė, 2019; Ubarevičienė & van Ham, 2017; UT, 2021). Prioritizing these other issues could potentially reduce the influence of people's environmental considerations on their behavior. Yet, we found that biospheric values and environmental self-identity nevertheless explained pro-environmental behaviors among adults in Lithuania. Specifically, in Chapter 3 we found that general environmental considerations were associated with recycling and environmental activism. Additionally, in Chapter 6, we found that general environmental considerations were associated, via behavior-specific personal norms, to purchasing organic food products, using reusable bags for shopping, purchasing local food products, selling or giving away unused items, purchasing unpackaged goods, refusing to drink bottled water, bringing plastic bottles to the deposit station and recycling non-refundable plastic. Together, the results are in line with previous studies in WEIRD countries indicating that biospheric values and environmental self-identity can explain multiple pro-environmental behaviors, via personal norms to engage in these behaviors (van der Werff et al., 2013b, 2014b), and provide the first evidence that these relationships also hold in Lithuania, which faces larger social, demographic and economic challenges compared to the WEIRD countries that have typically been studied so far.

Whereas we provide evidence that environmental considerations could drive pro-environmental behaviors in a non-WEIRD country, the findings also suggest that there may be contextual factors specific to non-WEIRD countries that prevent people from acting upon their environmental considerations and in turn engaging in pro-environmental behavior. Indeed, environmental considerations were not related to fuel-efficient driving and the use of sustainable transportation among adults in Lithuania (Chapter 3). Also, eating vegetarian food was not associated with adults' biospheric values, although associated with environmental self-identity and personal norm to eat vegetarian food (Chapter 6). We propose, first, that underdeveloped infrastructure in non-WEIRD countries might discourage people from engaging in some pro-environmental behaviors, by making the behavior too costly and/or effortful (Gatersleben et al., 2014; Whitmarsh & O'Neill, 2010). For example, scarce and unsafe cycling tracks in Lithuania might discourage people from commuting by bike, even if they have strong biospheric values. Or, insufficiently maintained public transportation (e.g., poor heating, cooling and cleanness) might prevent people from using public transport. Second, some behaviors in Lithuania are not profiled as pro-environmental. This might lead to not recognizing some behavior as pro-environmental (e.g., stopping the car engine at the traffic lights) and relatedly not knowing how to act pro-environmentally can prevent people from engaging in pro-environmental behaviors, even of those people with strong environmental considerations. Third, strong cultural norms could limit the effect of environmental considerations on behavior. For example, the importance of meat in Lithuanian cuisine could discourage people from eating vegetarian food, despite their strong environmental considerations. Or, the need to comply with the norms of one's own group, for example, by showing off and violating driving rules and speeding – so prominent in Lithuania - could prevent from adopting fuel-efficient driving style (Guo et al., 2022; Taubman - Ben-Ari & Yehiel, 2012). Fifth, people might despise some pro-environmental behaviors because engaging in them would harm their self-image. For example, the prominent belief in Lithuania that successful people commute by car, not public transportation, might lead to nine out of ten people in Lithuania commuting by car (TV3, 2021). We discussed these findings through the lens of factors relevant to Lithuania. Other non-WEIRD countries can hold a unique mix of factors preventing people from acting pro-environmentally in their

country. Future research could study the influence of these country/culture-relevant factors on the relationships between environmental considerations and pro-environmental behavior.

Due to adolescence-specific developmental peculiarities, environmental considerations might not be the leading factor that explains pro-environmental behavior. Other factors may play an important role in guiding adolescents' pro-environmental behavior, such as social norms, which can be particularly important in adolescence due to increased susceptiveness to peer influence (Albert et al., 2013), and perceived behavioral control, which for some behaviors (e.g., commuting and diet) could be lower in adolescence than in adulthood. We therefore studied the extent to which environmental considerations are related to multiple pro-environmental behaviors among adolescents, in Lithuania. We consistently found that environmental considerations were associated with various pro-environmental behaviors of adolescents in Lithuania, namely recycling, using sustainable transportation means, purchasing environmentally friendly products, recycling non-refundable plastic, purchasing organic food products, cycling to school, reusing bags for shopping, giving away or selling unused items, purchasing local food products, eating vegetarian food and bringing plastic bottles to the deposit station (Chapter 4, 5 and 6). More specifically, we found that biospheric values and environmental self-identity were associated with adolescents' personal norms to engage in these different pro-environmental behaviors, which in turn led to the respective behaviors. This provides important initial evidence that biospheric values, environmental self-identity and personal norms are universal predictors that can guide pro-environmental behaviors beyond adult samples. Relatedly, and similar to the adults' sample, not all types of behaviors were consistently associated with environmental considerations among adolescents. Specifically, biospheric values, environmental self-identity and personal norms to engage in pro-environmental behavior weakly predicted bottled water use in Chapter 4, while in Chapter 5 did not predict this behavior at all as well as purchasing packaged goods in Chapter 6. We propose that social factors such as the need to comply with peer norms (e.g., it might be seen as not "cool" to drink tap water) and contextual factors such as availability of certain products in grocery store (e.g., only packaged items available, cheaper options are packaged) could prevent the translation of adolescents' environmental considerations to behavior.

To study this further, we compared how well general environmental considerations explain adolescents' multiple pro-environmental behaviors compared to behavior-specific factors (Chapter 5). For that, we compared two theoretical models, namely the VIP model (van der Werff & Steg, 2016), which focuses on general environmental considerations, and the CADM model (Klöckner & Blöbaum, 2010), which focuses on behavior-specific factors. Based on the CADM, personal norms to engage in specific pro-environmental behaviors are affected by people's social norms, awareness of need, awareness of consequences and perceived behavioral control. Personal norms in turn lead to habits and intentions to engage in pro-environmental behavior. Next, situational factors, namely perceived behavioral control and access to behavior could directly foster or inhibit adolescents' pro-environmental behavior. Both VIP and CADM postulate that their respective factors influence people's intention to act pro-environmentally, which in turn can lead to actual pro-environmental behavior. In addition, the CADM suggests that pro-environmental behavior could be performed automatically, out of habit. We studied how well the VIP and CADM can explain different pro-environmental behaviors of adolescents in Lithuania.

Results across two studies in Chapter 5 among adolescents in Lithuania revealed that general environmental considerations (VIP) and behavior-specific factors (CADM) explained a substantial amount of variance in three out of four studied pro-environmental intentions and behaviors, namely using bottled water (Study 1), taking one's own bag for shopping and giving away or selling unused items (Study 2). As regards purchasing packaged goods, both general environmental considerations and behavior-specific factors could only explain the behavioral intentions, but not the actual behavior. Across all the behaviors, general environmental considerations explained somewhat less variance, which is not unexpected given the compatibility principle, namely the general constructs predict other general constructs better than specific constructs (Rim et al., 2013; Trope & Liberman, 2012). Indeed, general environmental considerations could better predict general trends to engage in pro-environmental behavior, whereas behavior-specific factors could better predict specific behaviors, which we indeed found across three studies (Chapter 4). Overall, we suggest that both types of factors are needed to understand pro-environmental behavior. Environmental considerations can set a trend for

multiple behaviors and general tendency to act pro-environmentally, making environmental considerations important targets for interventions. While behavior-specific factors need to be taken into account too because they might play a role once people start considering to engage in specific pro-environmental behaviors.

All in all, we provided evidence that environmental considerations are important factors explaining pro-environmental behavior beyond the typically studied WEIRD countries, namely in Lithuania, and beyond the adult samples, namely among adolescents. Yet, other factors characteristic to the context (e.g., contextual barriers such as poor infrastructure in non-WEIRD countries) and to specific target groups (e.g., social norms among adolescents) could play a central role in determining whether people act upon their environmental considerations. It is therefore important in future studies to also look at such behavior-specific factors and test how these factors moderate the relationship between environmental considerations and behavior, or how they directly affect behavior alongside environmental considerations, among different people and in different contexts. To add, in Chapter 5 we found that habits were strongly related to three out of four adolescents' pro-environmental behaviors. Strong habits could prevent people from even considering the environment in their behavior, because they engage in those behaviors automatically. Thus, future studies could test whether environmental considerations become more prominent in situations where habits may be less prevalent and identify the most suitable times for changing habits of adolescents, for example when people move to a different location and need to create new habits. Given that strong habits could have been formed because people started to engage in behavior based on their environmental considerations, future studies could test what role environmental considerations play in explaining environmental behavior when included in such models as CADM.



### 7.1.3 The relationship Between Parents' and Adolescents' Environmental Considerations

We proposed that one of the possible contexts where environmental considerations could take shape is within a family. This is because family is an important structure where various personal psychological characteristics emerge and form (Manfredo et al., 2017; Olkinuora, 1972; Schwartz, 1977). Family

members could potentially influence each other's environmental considerations. For example, parents could influence their adolescent children's environmental considerations and behavior, via setting the example and transmitting their values and norms, and adolescents could influence those of their parents, by bringing home ideas that they learned at school or from their peers (Boudet et al., 2016; Grønhøj & Thøgersen, 2017). The first step to understand whether and how parents and adolescents influence each other, is by studying whether at all and how their environmental considerations are related, which we addressed in this thesis.

We tested the relationship between biospheric values, environmental self-identity, personal norms to engage in pro-environmental behavior and pro-environmental behavior in a representative sample of adolescents and their parents in Lithuania (Chapter 6) and found that these constructs were strongly positively related. These results expanded previous studies that suggested parents' and adolescents' values, identities and norms are related (Doring et al., 2017; Friedlmeier & Trommsdorff, 2011; Gibbs, 2013; Gotschi et al., 2009; Hardy et al., 2008; Kandler et al., 2016; Schachter & Ventura, 2008; Schinkel & de Ruyter, 2017), by showing this relationship holds for environmental considerations too, including the general environmental considerations as well as behavior-specific personal norms to engage in specific pro-environmental behaviors. Next, adding to the studies that showed that parents' and adolescents' pro-environmental behaviors are related (Grønhøj & Thøgersen, 2009, 2012; Katz-Gerro, Greenspan, Handy, & Vered, 2019; Wallis & Klöckner, 2018), our findings suggest this relationship is likely not simply because parents and adolescents mimic each other's pro-environmental behavior, but because they share environmental considerations that in turn guide such behaviors.

The next question is whether parents influence their adolescent children's environmental considerations and behavior, adolescents influence their parents' considerations and behavior or the influences are reciprocal. Past studies that explored this question looked at the relationship between parent-adolescent other relevant constructs beyond biospheric values and environmental self-identity. For example, parents' environmental attitudes (Collado, Evans, et al., 2017; Evans et al., 2018) and climate change concern (Lawson et al., 2019) did not explain children's/adolescents' pro-environmental behavior; but parents' climate change awareness explained adoles-

cents' pro-environmental behavior (Xia & Li, 2022) and adolescents' concern explained parents' behavior, yet in both cases the relationship was very weak. These findings might suggest that parents' general environmental attitudes or constructs alike might have limited effects on adolescents' pro-environmental behaviors or vice versa; adolescents' general attitudes and constructs alike have limited effect on parents' behavior. This might be because these constructs alone do not represent intrinsic motivation path to behavior: environmental attitudes or constructs alike might reflect one's general ideas about environment conservation, yet these ideas might not necessarily translate into behavior. Therefore, it is important to explore in future studies to what extent parents' general environmental considerations – representing parents' intrinsic motivation to act pro-environmentally, namely biospheric values and environmental self-identity – explain their adolescent children pro-environmental behavior and vice versa.

To conclude, with this study we demonstrated that biospheric values, environmental self-identity and personal norms are positively related between parents and their adolescent children. Future studies could further test the conditions under which the relationship is strongest as well as the direction of the relationship.



### 7.1.4 Limitations and Directions for Future Research

We used correlational design to study the relationships between environmental considerations and pro-environmental behavior of adults in Lithuania and among adolescents. The results are important because they provide first evidence that environmental considerations and personal norms to engage in pro-environmental behavior can explain multiple pro-environmental behaviors in Lithuania and among adolescents (Chapter 3, 4, 5 and 6). Yet, correlational design does not allow us to draw definite conclusions about the causal relationship between people's environmental considerations and pro-environmental behavior. Research in WEIRD countries already showed that some environmental considerations could be strengthened and affect behavior, but this has not been studied for countries like Lithuania and for adolescents. Thus, future studies in other contexts and samples could manipulate environmental considerations in experimental studies and test the effect of this manipulation on pro-environmental behavior. For example, environmental self-identity

could be strengthened by reminding people of their past pro-environmental behavior (van der Werff et al., 2014b; van der Werff & Steg, 2018) and see how this affects personal norms to engage in pro-environmental behavior and in turn behavior. Similarly, personal norms to engage in pro-environmental behavior can be strengthened with social norms interventions (de Groot et al., 2021) and test the effect on pro-environmental behavior. Or, educational programs could strengthen biospheric values and in turn pro-environmental behavior (Wijngaarden, 2019). Yet these strategies are limited too because biospheric values cannot be changed on a situational basis (Manfredo et al., 2017). Environmental self-identity might be not so easy to change too (van der Werff & Steg, 2018).

Second, causal relationships could be tested by means of a longitudinal design (Costantini & Perugini, 2018). Specifically, by observing how the model variables develop and change over time, and the extent to which these changes reflect on the other variables in a model (Crocetti et al., 2019). For example, one could measure environmental self-identity and test repeatedly in different time points how changes - if any - in environmental self-identity affect other variables (e.g., personal norms to engage in pro-environmental behavior and pro-environmental behavior).

We studied the relationships between parents' and adolescents' environmental considerations to get the very first impression whether they are related (Chapter 6). This is an important first step in understanding whether environmental considerations could be shaped in a family context. Yet, the results of this study do not allow to confirm that environmental considerations indeed are shaped in a family context. There are equal odds that parents' and adolescents' environmental considerations are shaped by influencing each other (Knafo-Noam et al., 2020; Knafo & Galansky, 2008), as well as that third factors outside the family context could affect the formation of their environmental considerations, such as peer pressure or public debate on environmental issues. Furthermore, if environmental considerations indeed form within parent-adolescent interaction, we do not know the direction of this relationship, namely whether parents influence their adolescent children, or children influence their parents, or the relationship is bidirectional. Thus, given that we found strong relationships between environmental considerations and behavior of parents and their adolescent children, it is worthwhile to investigate these relation-

ships further. The relationship of parents' and their adolescent children's environmental considerations could be measured in different points in time to explore how, and under which conditions they form, grow and change, as is widely done in developmental psychology research to explore the formation of general values, identity and norms in various stages of individual's development, from early childhood to adulthood (Klimstra et al., 2010; Malti et al., 2021; Meeus et al., 2010; Milfont et al., 2016; Vecchione et al., 2019). Studies could also explore under which conditions parent-adolescent environmental considerations are related the strongest (e.g., when environmental issues are discussed at home). In addition, one could test possible third factors that could influence both parents' and adolescents' environmental considerations. For example, one could explore if public debate about environmental issues affects parent-adolescent environmental considerations.

While we tested the relationship between environmental considerations and many different pro-environmental behaviors in a country other than typical WEIRD countries (Chapter 3, 4, 5 and 6), the samples, however, were not fully representative. The majority of the adults' sample, including parents in parent-adolescent sample, consisted of highly educated women (Chapter 3 and 6). Future studies could use more balanced samples in terms of gender and education. This is particularly challenging to achieve in studies where parents participate together with their children; usually, mothers opt to participate in such studies (Davison et al., 2016, 2017; Phares et al., 2005). In future studies, specific strategies could be used to encourage both parent's participation (see Yaremych & Persky, 2022). It is important to represent both parents in parent-child studies because there is evidence to suggest women scored higher in pro-environmental behavior and environmental attitudes (López-Mosquera, 2016; Ramstetter & Habersack, 2020). In addition to this, the relationship between environmental concern in mother-daughter and father-daughter dyads was stronger than in mother-son and father-son dyads (Casaló & Escario, 2016). These results potentially might be applicable for our study too. Namely, mother/father-daughter environmental considerations could be more strongly related than mother/father-son, thus future studies could test this. Next, female adolescents were slightly better represented than male adolescents in Chapter 4 and Chapter 5 (Study 1). This is important to consider because, for example, some studies suggest female adolescent expressed higher levels of concern for

climate change (Stevenson et al., 2019) leading to engagement in pro-environmental behavior (Chan et al., 2017), suggesting that gender could potentially have an effect on the relationship between environmental considerations and behavior (Collado, Evans, et al., 2017). Yet we solved this issue in Chapter 5 (Study 2) and Chapter 6 by exploring the relationship between environmental considerations and pro-environmental behavior among representative sample of Lithuania adolescents. The strength of relationship between environmental considerations and behavior was similar across both studies, suggesting overrepresentation of women participants did not affect the results. Further, studies suggest that beyond commonly used socio-demographic characteristics for balancing samples such as gender, age, education and income, other important criteria are overlooked in studies (Ghai, 2021; Henrich et al., 2010). For example, people from economically disadvantaged backgrounds, retired people, people with disabilities, ethnic and gender minorities are underrepresented in research (Ghai, 2021). Having balanced samples in terms of these additional characteristics might be especially relevant in non-WEIRD countries because they are exposed to a set of distinct issues specific to these countries, that might affect the relationship between environmental considerations and behavior. For example, issues prominent in non-WEIRD countries might have cumulative effect with issues specific to local groups such as ethnic minorities. Thus, future studies could employ more diverse samples in Lithuania and other non-WEIRD countries. This is important because factors affecting environmental considerations-behavior link might differ across countries. For example, in some countries, the prominence of social issues (e.g., high rates of people living below the poverty line) might be the main barrier that prevents the translation of environmental considerations into pro-environmental behavior, while in other countries, the lack of infrastructure might be the main barrier. Even the role of such commonly used factor as gender in explaining people's view that nature needs to be protected, awareness of environmental problems and willingness to pay for environment protection indeed differ depending on country; gender differences on these constructs are much lower in countries with higher levels of gender inequality, power distance, collectivism and economic scarcity (Chan et al., 2017). Finally, the constructs representing human-environment relationship need to be clarified in different countries too, as Chapter 2 rely on studies that mostly represent WEIRD countries. Specif-

ically, systematic literature review – where we studied the extent to which environmental self-identity was distinct from other constructs representing human-environment relationship – yielded studies that were conducted mostly in female student samples in Europe; and only one study out of 14 could be considered as truly representative of Australia's general population (Hine et al., 2013). Only two studies were conducted outside the Western countries, namely in China and Hungary. With more studies being conducted across different countries and samples, future research could better represent these studies in examining the relationships between the constructs representing human-environment relationship. Such research could also aim at focusing on samples that are less often studied and more representative of the general population, for example, by seeking out unpublished studies and grey literature in these countries. Earlier in this paragraph, we suggested that gender has an effect on the strength of willingness to pay for environmental protection or higher levels of concern for climate change, and this, in turn, can affect the strength of the relationship between these constructs and pro-environmental behavior. Yet, it should be noted that differences in means do not necessarily imply that the relationships differ (see Bhushan et al., 2019).



### 7.1.5 Practical Implications

In this dissertation, we demonstrated that environmental considerations are related to many pro-environmental behaviors beyond typical WEIRD countries and adult samples. Specifically, we found evidence that supports environmental considerations and pro-environmental behavior relationship in Lithuania even if people in this country experience other prominent social, demographic and economic issues. Furthermore, environmental considerations guided pro-environmental behaviors of adolescents. This suggests that biospheric values, environmental self-identity and personal norms to engage in pro-environmental behavior can be targeted in interventions aimed at fostering many pro-environmental behaviors on a broad scale. Yet given the cross-sectional nature of the studies, we recommend that interventions that were successful in strengthening environmental considerations elsewhere and for adults, could first be replicated in Lithuania (and countries alike) and for adolescents before applying them at a broader scale.

Building on these findings, we distinguish two routes how this relationship could be facilitated for promoting pro-environmental behavior in non-WEIRD countries and among adolescents (Figure 1). First, environmental considerations could be targeted in interventions by, for example, strengthening people's environmental self-identity by reminding people of their past pro-environmental behavior (van der Werff et al., 2014b; van der Werff & Steg, 2018). This strategy is noteworthy since interventions often focus on behaviors that people do not engage in, instead of building on and emphasizing behaviors that people already consistently engage in. Similarly, personal norms to engage in pro-environmental behavior could be strengthened with social norms interventions (de Groot et al., 2021). Social norms interventions might be particularly relevant for adolescents since we found a strong relationship between adolescents' social norms and personal norms to engage in pro-environmental behavior. This could suggest that employing social norms in interventions might strengthen adolescents' personal norms to engage in pro-environmental behavior and in turn encourage their pro-environmental behavior. Next, environmental education could be yet another way to strengthen young people's environmental considerations, namely biospheric values (Wijngaarden, 2019). Family could potentially serve as a basis for encouraging people's environmental considerations and pro-environmental behavior. Indeed, we found a strong relationship between environmental considerations of parents and their adolescent children. Environmental non-governmental organizations could target families with children, for example, at the community level, but first research is needed to test whether at all family members influence each other's environmental considerations. In addition, for practitioners might be useful to know that some pro-environmental behaviors are driven by environmental considerations directly rather than via indirect moral route suggested by the VIP model (van der Werff & Steg, 2016). For example, environmental self-identity and personal norms to eat vegetarian food were directly related to vegetarian food choices of adults (Chapter 5). This suggests people engage in pro-environmental behavior not necessarily because they care for nature conservation, but rather because they see themselves as environmentally friendly people and because they feel moral obligation to act pro-environmentally. Thus, for some behaviors might be practical to emphasize doing the right thing (i.e., targeting one's moral

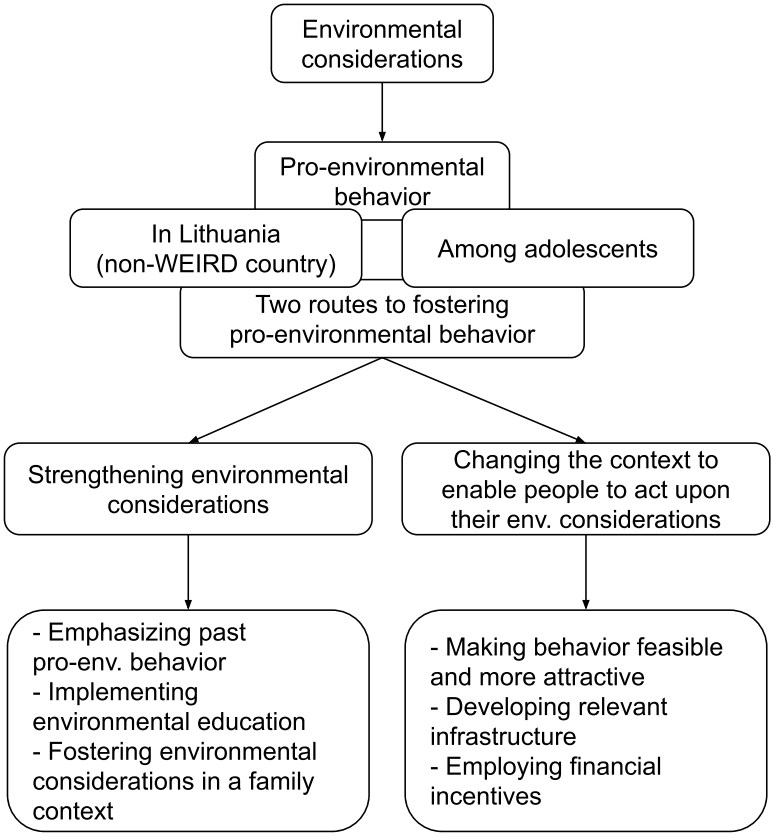
obligation). This strategy might be particularly relevant for behaviors that would be difficult to motivate with nature protection motives. Alternatively, biospheric values might have influenced environmental self-identity and personal norms to the point where biospheric values no longer play a direct role in explaining vegetarian food choices; thus, these choices are directly explained by environmental self-identity and personal norms. Future studies could test these assumptions further.

The second possible route that could make it easier for people to act on their environmental considerations is making pro-environmental behavior accessible and affordable. For example, purchasing unpackaged goods for adolescents could be encouraged with in-store interventions, such as education (e.g., indicating benefits of unpackaged goods), economic incentives (e.g., making unpackaged products cheaper) and environmental appeals (e.g., emphasizing the benefits of unpackaged goods for the environment) (Hartmann-Boyce et al., 2018; Marken & Hörisch, 2019). To add, given that social norms were strong predictor of adolescents' personal norms to engage in pro-environmental behavior (Chapter 5) interventions could focus on emphasizing peer choice of unpackaged goods as is done in interventions to encourage adults' recycling behavior (Schultz, 1999). In cases where social norm interventions are not an option (e.g., peers do not engage in the target behavior), researchers could alternatively employ dynamic norm interventions. In dynamic norm interventions, the focus is on the extent to which other people's behavior changes over time, rather than normative information about people's current behavior (Sparkman, 2021). For example, studies found that dynamic norm interventions increased people's willingness to eat less meat and order meals without meat at restaurants.(Sparkman & Walton, 2017). Next, lack of a relevant infrastructure or overemphasizing infrastructure of unsustainable commuting in non-WEIRD countries might prevent people from acting on their environmental considerations. We indeed found that environmental considerations do not explain the choice of sustainable transportation means in Lithuania. Thus, developing proper cycling infrastructure which is well connected across the city or area can encourage people to use cycling paths. Studies from WEIRD countries indeed show that the presence of cycling paths and facilities also street connectivity and paths density, are the most significant predictors explaining people's cycling behavior (Chan et al., 2017; Schoner & Levinson, 2014). Inter-

estingly, workplace infrastructural solutions, such as showers, lockers and bike parking increased cycling to work (Hamre & Buehler, 2014). Similarly, public transportation use can be increased by developing attractive public transportation system in terms of convenience, scheduling and cleanliness; but also, by reducing car parking availability at the workplace (Hamre & Buehler, 2014). The strategies discussed earlier might sound trivial, but not necessarily for countries like Lithuania where people use cars for most of their commutes and travels (TV3, 2021).Frequent car use and avoiding environmentally friendly transportation, might be caused by the view that owning a car is a symbol of status. This view can potentially obstruct acting upon one's environmental considerations and choosing environmentally friendly transportation. If such a view is strongly entrenched in society this might also hinder policies aiming to facilitate environmentally friendly transportation use. Given that public views toward environmentally friendly transportation and car use might hold strong cultural, economic and symbolic influences (Graves-Brown, 1997; Steg, 2005), future studies could look at what role these factors play in explaining the environmental considerations-behavior relationship in non-WEIRD countries.

To sum up, the dissertation highlights the value of environmental considerations to explain multiple pro-environmental behaviors beyond WEIRD countries and adult samples. Thus, environmental considerations might be an attractive target for interventions to connect people's environmental considerations and behavior: by strengthening the environmental considerations and implementing contextual changes to enable people to act upon their environmental considerations (Figure 1). It should be noted that in Figure 1 we provide strategies for interventions based on the research of this thesis, thus the list is not exhaustive. Other relevant strategies could be employed too, for example, changing people's perceptions about feasibility of behavior, as people might not recognize that the context may be favorable.

**Figure 1** Strategy to Encourage Pro-environmental Behavior



### 7.1.6 Conclusions

The main question of this dissertation was to what extent environmental considerations, namely biospheric values, environmental self-identity and personal norms to engage in pro-environmental behavior are universal in explaining variety of pro-environmental behaviors in a context and sample that was not tested previously, namely in Lithuania and among adolescents. We first demonstrated that environmental self-identity is a theoretically and empirically distinct construct from other constructs representing human-environment relationship, and that it is a valuable target for interventions aimed at promoting many different pro-environmental behaviors. Next, we found that general environmental considerations, namely biospheric values, environmental self-identity and personal norms, can explain various pro-environmental behaviors in Lithuania, despite the fact that people are dealing with various social, demographic and economic issues besides environmental issues. Further, environmental considerations explain many pro-environmental behaviors among adolescents, even though they experience age related peculiarities such as increased susceptiveness to peer influence. In fact, we found that general environmental considerations explain adolescents' pro-environmental behavior to a similar extent as behavior-specific factors, such as habits or intentions. Finally, we found that parents' and adolescents' environmental considerations were strongly related, suggesting that families could potentially be an important basis for shaping individuals' environmental considerations. Overall, we found support for the VIP model encompassing these environmental considerations. Environmental considerations did not explain some pro-environmental behaviors though, both for adults and adolescents, suggesting that there may be important barriers for people to act upon their pro-environmental considerations, which might be characteristic to a country context or a specific age group. Building on the findings, we proposed two routes to connect people's environmental considerations and behavior, namely strengthening the environmental considerations and implementing contextual changes to enable people to act upon their environmental considerations.

7

# Summary in Dutch

# (Nederlandse samenvatting)

## 1.1 Introductie

Biosferische waarden (dat wil zeggen, in hoeverre iemand als algemeen levensdoel de bescherming van de natuur en het milieu heeft; Steg & de Groot, 2012) en milieu-zelfidentiteit (dat wil zeggen, in hoeverre iemand zichzelf beschouwt als iemand die milieuvriendelijk leeft; van der Werff et al., 2013b) zijn de algemene sleutelfactoren die richting geven aan veel vormen van milieuvriendelijk gedrag. Als algemene factoren kunnen ze concreet milieuvriendelijk gedrag beïnvloeden via factoren die specifiek zijn voor dergelijk gedrag, zoals persoonlijke normen om op bepaalde manieren te handelen (van der Werff et al., 2013a, 2013b, 2019). Persoonlijke normen zijn geïnternaliseerde morele standaarden die zich uiten als het gevoel van een morele verplichting om zich met diverse vormen van milieuvriendelijk gedrag bezig te houden (Schwartz, 1977; Steg et al., 2011), zoals persoonlijke normen om autogebruik te verminderen, voor duurzame kleding te kiezen en groene energie te gebruiken (Barbarossa & De Pelsmacker, 2016; Nordlund & Garvill, 2003; van der Werff et al., 2013a). Als zodanig verbinden persoonlijke normen de biosferische waarden en milieu-zelfidentiteit met specifiek milieuvriendelijk gedrag.

De hele keten van connecties tussen biosferische waarden en milieuvriendelijk gedrag die bepaald wordt door milieu-zelfidentiteit en persoonlijke normen uit zich in diverse vormen van gedrag, waaronder het gedrag thuis, op vakantie en op het werk (Ruepert et al., 2016; van der Werff & Steg, 2016; Xu et al., 2019). Dit model is echter alleen getest in de zogeheten WEIRD-landen (Westers, opgeleid, geïndustrialiseerd, rijk en democratisch; Henrich, Heine, & Norenzayan, 2010) en uitsluitend onder volwassenen. We weten daarom niet in hoeverre dit model gegeneraliseerd kan worden voor minder onderzochte landen en voor andere groepen dan volwassenen. Wanneer we milieubelangen willen gebruiken om milieuvriendelijk gedrag grootschalig te stimuleren, moeten we de relatie tussen milieubelangen en milieuvriendelijk gedrag bestuderen in minder onderzochte contexten en onder andere personen die in voorgaand onderzoek niet meegenomen zijn. Zo moeten mensen in andere dan de WEIRD-landen worden opgenomen vanwege de wereldschaal waarop klimaatverandering plaatsvindt en moeten tieners opgenomen worden omdat zij de volgende generatie vertegenwoordigen die door de klimaatverandering

getroffen wordt en wier acties cruciaal zijn voor het beperken van klimaatverandering. Om dit gat te overbruggen onderzoeken we in deze dissertatie in hoeverre algemene milieubelangen, te weten biosferische waarden en milieu-zelfidentiteit, en specifieke milieubelangen, te weten persoonlijke normen om milieuvriendelijk gedrag te vertonen, verschillende vormen van milieuvriendelijk gedrag verklaren in Litouwen en onder tieners. Kennis van de factoren die personen stimuleren tot meerdere vormen van milieuvriendelijk gedrag is met name relevant voor belanghebbenden zoals beleidsmakers, milieuactivisten, opleiders, gemeenschappen, ngo's en iedereen die zich bezighoudt met onderwerpen die verband houden met de klimaatcrisis. Het onderscheiden van factoren die bij verschillende bevolkingsgroepen in verschillende omgevingen alom milieuvriendelijk gedrag stimuleren, kunnen bijdragen aan een grootschalige aanpak van de klimaatcrisis.

## 1.2 Bevindingen



Als eerste toonden we aan dat milieu-zelfidentiteit een construct is dat theoretisch en empirisch afwijkt van andere constructen (milieu-identiteit (Clayton, 2003) en verbondenheid met de natuur (Schultz, 2002)) die de relatie tussen mens en milieu symboliseren en dat het een waardevol doel is voor interventies die erop gericht zijn om veel verschillende soorten milieuvriendelijk gedrag te stimuleren (hoofdstuk 2). Vervolgens zagen we dat algemene milieubelangen, te weten biosferische waarden, milieu-zelfidentiteit en persoonlijke normen een verklaring kunnen geven voor verschillende soorten milieuvriendelijk gedrag in Litouwen ondanks dat de bevolking te maken heeft met diverse maatschappelijke, demografische en economische vraagstukken naast milieuvraagstukken (hoofdstukken 3 en 6). Voorts kunnen milieubelangen een verklaring geven voor verschillende soorten milieuvriendelijk gedrag van tieners, zelfs als zij te maken hebben met eigenschappen die typisch voor hun leeftijd zijn, zoals verhoogde ontvankelijkheid voor groepsdruk van leeftijdgenoten (hoofdstukken 4, 5 en 6). We zagen zelfs dat milieuvriendelijk gedrag van tieners even goed door algemene milieubelangen verklaard kan worden als door gedragsspecifieke factoren, zoals gewoontes en voornemens (hoofdstuk 5). Ten slotte zagen we

dat de milieubelangen van ouders en tieners sterk met elkaar waren verbonden, wat erop zou kunnen duiden dat het gezin een belangrijke basis kan zijn bij de vorming van iemands milieubelangen. In het algemeen vonden we in meerdere studies steun voor het feit dat het zogeheten VIP-model (Waarden-Identiteit-Persoonlijke normen-model) dergelijke milieubelangen omvat. Onder anderen gaven milieubelangen een verklaring voor bepaald gedrag, zoals recyclen in het algemeen, recyclen van wegwerpplastic, inzamelen van plastic flesjes, kopen van milieuvriendelijke, biologische en lokaal geproduceerde producten, hergebruik van boodschappentasjes, weggeven of verkopen van ongebruikte goederen, kraanwater in plaats van flesjeswater drinken, vegetarisch eten, op de fiets naar school gaan en milieuactivisme. Milieubelangen gaven echter geen verklaring voor bepaalde vormen van milieuvriendelijk gedrag door zowel volwassenen en tieners, zoals het gebruik van duurzaam vervoer door volwassenen en het kopen van onverpakte producten door tieners, wat erop zou kunnen wijzen dat er voor mensen belangrijke hindernissen kunnen zijn om naar hun milieubelangen te handelen. Dat zou kenmerkend kunnen zijn voor een land, context of specifieke leeftijdsgroep.

## 1.3 Suggesties voor vervolgonderzoek

We hebben een correlationeel ontwerp toegepast op het onderzoek naar de relaties tussen milieubelangen en milieuvriendelijk gedrag. Een correlationeel ontwerp stelt ons echter niet in staat om definitieve conclusies te trekken over het causale verband tussen milieubelangen en milieuvriendelijk gedrag. Zo kunnen in toekomstige onderzoeken milieubelangen in een experimentele omgeving gemanipuleerd worden om te onderzoeken hoe dergelijke sturing milieuvriendelijk gedrag beïnvloedt. Milieu-zelfidentiteit zou bijvoorbeeld versterkt kunnen worden door iemand zich eerder vertoond milieuvriendelijk gedrag te laten herinneren (van der Werff et al., 2014b) en te kijken welk effect dit heeft op persoonlijke normen om zich bezig te houden met milieuvriendelijk gedrag, en vervolgens op gedrag zelf. Op dezelfde manier kunnen persoonlijke normen om zich bezig te houden met milieuvriendelijk gedrag versterkt worden door interventies met maatschappelijke normen (de Groot et al., 2021) en is zo het effect op milieuvriendelijk gedrag te testen. Ook kunnen

onderwijsprogramma's biosferische waarden en daarmee milieuvriendelijk gedrag versterken (Wijngaarden, 2019). Ten tweede kunnen causale relaties longitudinaal onderzocht worden (Costantini & Perugini, 2018). Met name gaat het dan om het bekijken hoe de modelvariabelen zich gedurende de tijd ontwikkelen en veranderen en in hoeverre deze veranderingen de andere variabelen van een model weerspiegelen (Crocetti et al., 2019).

Verder stellen de resultaten van het ouder-tienersonderzoek ons niet in staat om te bevestigen dat milieubelangen inderdaad binnen het gezin worden gevormd. Het is net zo goed mogelijk dat de milieubelangen van ouders en tieners door wederzijdse beïnvloeding worden gevormd (Knafo-Noam et al., 2020), net zoals dat factoren buiten het gezin de vorming van milieubelangen kunnen beïnvloeden, zoals de druk van leeftijdgenoten of het publieke debat over het milieu. Zo kan deze relatie op verschillende momenten gemeten worden om te onderzoeken hoe, en onder welke omstandigheden, deze gevormd wordt, zich ontwikkelt en verandert. Vervolgonderzoek kan ook bestuderen onder welke voorwaarden milieubelangen van ouders en tieners het sterkst gerelateerd zijn (bijvoorbeeld wanneer er thuis over het milieu wordt gesproken).



De steekproeven in deze dissertatie zijn niet volledig representatief, met name in de hoofdstukken 3 tot en met 6. De meerderheid van de steekproeven onder volwassenen, waaronder de ouders in de steekproef onder ouders en tieners, bestond uit hoogopgeleide vrouwen (hoofdstukken 3 en 6). In toekomstige studies zouden evenwichtigere steekproeven met betrekking tot gender en opleiding kunnen worden gedaan. Dit kan met name lastig zijn bij studies waaraan ouders samen met hun kinderen deelnemen (Davison et al., 2016). Moeders nemen over het algemeen graag deel aan dergelijke onderzoeken. Toekomstige studies zouden de deelname van beide ouders kunnen stimuleren (Yaremych & Persky, 2022). Daarnaast deden er net iets meer meisjes dan jongens mee, zie hoofdstukken 4 en 5 (Studie 1). Het is belangrijk om dit in ogenschouw te nemen omdat sommige onderzoeken er bijvoorbeeld op duiden dat meisjes bezorgder zijn om klimaatverandering (Stevenson et al., 2019), wat tot milieuvriendelijker gedrag leidt (Chan et al., 2017). Dit kan erop wijzen dat gender mogelijk bepalend is voor de relatie tussen milieubelangen en gedrag (Collado, Evans, et al., 2017). Dit vraagstuk hebben we echter opgelost in hoofdstuk 5 (Studie 2) en hoofdstuk 6 door de relatie tussen milieu-

belangen en milieuvriendelijk gedrag te onderzoeken in een representatieve steekproef onder tieners in Litouwen.

Voorts zijn in deze studie, net als in ander onderzoek, mensen met een economisch achtergestelde achtergrond, gepensioneerden, gehandicapten, etnische en genderminderheden ondervertegenwoordigd en vaak niet onderzocht (Ghai, 2021; Henrich et al., 2010). Een met deze aanvullende kenmerken gebalanceerde steekproef zou met name relevant kunnen zijn in niet-WEIRD-landen omdat zulke groepen te maken hebben met vraagstukken die specifiek zijn voor deze landen en die van invloed kunnen zijn op de relatie tussen milieubelangen en gedrag. Zo kunnen belangrijke vraagstukken in niet-WEIRD-landen bijvoorbeeld een opstapelend effect hebben op vraagstukken die specifiek voor lokale groepen zoals etnische minderheden gelden. Als zodanig zouden toekomstige studies hun steekproeven in Litouwen en andere niet-WEIRD-landen kunnen uitvoeren.

Ten slotte moeten de constructen die op de relatie tussen mens en milieu zien ook in verschillende landen verhelderd worden, aangezien hoofdstuk 2 vooral over onderzoek in WEIRD-landen gaat. Meer in het bijzonder heeft systematisch literatuuronderzoek studies opgeleverd die vooral uitgevoerd zijn met steekproeven onder vrouwelijke studenten in Europa. Slechts één van de veertien studies kon gezien worden als een daadwerkelijke vertegenwoordiging van de algemene bevolking van Australië (Hine et al., 2013). Slechts twee onderzoeken waren buiten de Westerse landen uitgevoerd, te weten in China en Hongarije. Wanneer er meerdere studies uitgevoerd worden in verschillende landen en met verschillende steekproeven kan toekomstig onderzoek een beter beeld geven van deze studies die de relaties tussen de constructen van de verhouding tussen mens en milieu weergeven.

## 1.4 Praktische implicaties

Voortbouwend op de bevindingen kunnen we twee routes onderscheiden waarop de relatie tussen milieubelangen en milieuvriendelijk gedrag bij tieners in niet-WEIRD-landen kan worden gefaciliteerd. Ten eerste kan met interventies gericht worden op milieubelangen door bijvoorbeeld de milieuzelfidentiteit te versterken door mensen zich bewust te maken van hun eerdere

milieuvriendelijke gedrag (van der Werff et al., 2014b; van der Werff & Steg, 2018). Deze strategie is opmerkelijk omdat interventies zich vaak richten op gedrag dat niet vertoond wordt in plaats van voort te bouwen op en het benadrukken van gedrag dat iemand al regelmatig vertoont. Op een vergelijkbare manier kunnen persoonlijke normen die tot milieuvriendelijk gedrag leiden versterkt worden door interventies met maatschappelijke normen (de Groot et al., 2021). Interventies met maatschappelijke normen kunnen met name relevant zijn voor tieners, omdat we een sterke relatie vonden tussen de maatschappelijke normen van tieners en hun persoonlijke normen die tot milieuvriendelijk gedrag leiden. Vervolgens kan milieuonderwijs een andere manier zijn om de milieubelangen, te weten biosferische waarden, van jonge mensen te versterken (Wijngaarden, 2019). Het gezin kan gebruikt worden als basis van waaruit milieubelangen en milieuvriendelijk gedrag worden gestimuleerd. We hebben immers een sterke relatie gevonden tussen de milieubelangen van tieners en hun ouders. Niet-gouvernementele milieuorganisaties zouden zich bijvoorbeeld op het gemeenschapsniveau op gezinnen met kinderen kunnen richten. Voor professionals kan het daarnaast nuttig zijn om te weten dat sommige vormen van milieuvriendelijk gedrag rechtstreeks door milieubelangen worden gestuurd in plaats van via de indirecte morele route die door het VIP-model wordt gesuggereerd (van der Werff & Steg, 2016). Milieu-zelfidentiteit en persoonlijke normen om vegetarisch te eten waren bijvoorbeeld direct te relateren aan de keuze van de ouders om vegetarisch te eten (hoofdstuk 5). Dit suggereert dat mensen niet noodzakelijkerwijs milieuvriendelijk gedrag vertonen vanuit het oogpunt van natuurbescherming, maar eerder omdat ze zichzelf als milieuvriendelijke mensen beschouwen en een morele verplichting voelen om milieuvriendelijk gedrag te vertonen. Zo kan het voor bepaalde vormen van gedrag praktisch zijn om te benadrukken dat je het juiste doet (dat wil zeggen, een morele verplichting aanspreekt), maar niet vanuit motieven voor milieubescherming.

De tweede mogelijke route waarbij het makkelijker gemaakt kan worden om vanuit milieubelangen te handelen, is door milieuvriendelijk gedrag toegankelijker en betaalbaarder te maken. Zo kunnen bijvoorbeeld tieners met interventies in de winkels gestimuleerd worden om onverpakte producten te kopen. Deze interventies kunnen bestaan uit bewustwording (bijvoorbeeld de voordelen van onverpakte producten noemen), economische stimuli (bijvoor-

beeld onverpakte producten goedkoper maken) en te appeleren aan het milieu (bijvoorbeeld door de voordelen van onverpakte producten voor het milieu te benadrukken) (Hartmann-Boyce et al., 2018; Marken & Hörisch, 2019). Daarnaast kan het gebrek aan een relevante infrastructuur of het teveel benadrukken van een niet-duurzame forenzeninfrastructuur in niet-WEIRD-landen verhinderen dat mensen naar hun milieubelangen handelen. We zagen inderdaad dat milieubelangen geen verklaring gaven voor de keuze van duurzaam vervoer van volwassenen in Litouwen. Zo kan het ontwikkelen van een goede fietspad-eninfrastructuur die alle delen van een stad verbindt mensen stimuleren om er gebruik van te maken. Onderzoek in WEIRD-landen laat inderdaad zien dat de aanwezigheid van fietspaden en -faciliteiten, evenals de verbinding tussen straten en de dichtheid van het aantal fietspaden, de belangrijkste voorspellers zijn voor fietsgedrag (Chan et al., 2017; Schoner & Levinson, 2014). Het is ook interessant dat bepaalde voorzieningen op de werkplek, zoals douches, kluisjes en fietsenstallingen tot vaker naar het werk fietsen leiden (Hamre & Buehler, 2014). Eveneens kan het gebruik van openbaar vervoer worden verhoogd door een aantrekkelijk openbaarvervoersysteem te ontwikkelen via verbetering van gebruiksgemak, dienstregelingen en hygiëne, maar ook door het aantal parkeerplaatsen bij de werkplek terug te brengen (Hamre & Buehler, 2014). De eerder besproken strategieën klinken wellicht triviaal, maar niet in het geval van een land zoals Litouwen waar mensen voor het merendeel van de woon-werkverplaatsingen en reizen de auto gebruiken (TV3, 2021). Het gebruik van de auto en het vermijden van milieuvriendelijk vervoer kan voortkomen uit de gedachte dat het bezit van een auto een statussymbool is. Deze gedachte kan mogelijk het handelen naar milieubelangen en de keuze voor milieuvriendelijk vervoer verhinderen. Wanneer zo'n gedachte diepgeworteld in de maatschappij is, kan dit ook in de weg staan van beleid dat gericht is op het faciliteren van milieuvriendelijk vervoer.

## 1.5 Conclusies

De dissertatie laat zien dat milieubelangen zoals biosferische waarden, milieuzelfidentiteit en persoonlijke normen (allemaal componenten van het VIP-model) geassocieerd worden met vele vormen van milieuvriendelijk gedrag van zowel volwassenen als tieners in een niet-WEIRD-land. Daarom zijn milieubelangen cruciale factoren waarop interventies zich kunnen richten om milieuvriendelijk handelen te stimuleren. Omdat sommige milieuvriendelijke gedragingen niet vanuit milieubelangen verklaard kunnen worden, kan het nodig zijn om het gat tussen deze belangen en milieuvriendelijk gedrag te overbruggen door een versterking van milieubelangen en een verandering van de context zodat mensen naar de milieubelangen kunnen handelen.

MYKOLO ROMERIO UNIVERSITETAS

**Audra Balundė**

# SUSIRŪPINIMO APLINKA GALIA PAAIŠKINTI APLINKĄ TAUSOJANTĮ ELGESĮ SKIRTINGIEMS ŽMONĖMS ĮVAIRIUOSE KONTEKSTUOSE

Daktaro disertacijos santrauka
Socialiniai mokslai, psichologija (S 006)

Vilnius, 2023

# Summary in Lithuanian
# (Santrauka lietuvių kalba)

# Pirmas skyrius: susirūpinimo aplinka galia paaiškinti aplinką tausojantį elgesį skirtingiems žmonėms įvairiuose kontekstuose

## 1.1 Įvadas

Jei žmonės tausotų aplinką, tai padėtų sušvelninti klimato krizę, su kuria šiandien susiduriame (IPCC, 2022). **Aplinką tausojantis elgesys (angl. *pro-environmental behavior*)**[38] įvardija veiksmus, kuriais siekiama išvengti žalos aplinkai ir ją apsaugoti (Steg ir Vlek, 2009). Klimato krizė – tai tokia situacija, kai reikia imtis neatidėliotinų veiksmų siekiant išspręsti ekologinius iššūkius ir sustabdyti žalą aplinkai (Oxford University Press, n.d.; Ripple ir kt., 2020). Ekologinių iššūkių mastas ir rimtumas skatina nustatyti bendruosius veiksnius, kurie galėtų paskatinti įvairių žmonių aplinką tausojantį elgesį skirtinguose kontekstuose. Nustačius šiuos bendruosius veiksnius, būtų galima imtis veiksmų, kuriais būtų siekiama skatinti aplinką tausojantį elgesį dideliu mastu, atsižvelgiant į esmines aplinką žalojančio elgesio priežastis.

Tyrimai parodė, kad žmonių **susirūpinimas aplinka (angl. *environmental considerations*)**, ypač **biosferinės vertybės (angl. *biospheric values*)** ir **aplinkosauginis tapatumas (angl. *environmental self-identity*)** yra svarbūs bendrieji veiksniai, galintys paskatinti įvairią aplinką tausojančią elgseną, padėsiančią sprendžiant klimato krizę (van der Werff ir kt., 2013a; van der Werff ir Steg, 2016). Biosferinės vertybės atspindi, kiek žmonės mano, kad rūpinimasis gamta ir aplinka yra esminis jų gyvenimo tikslas (Steg ir de Groot, 2012). Nustatyta, kad biosferinės vertybės paaiškina daugybę aplinką tausojančių elgsenų, įskaitant ketinimą sumažinti automobilio naudojimą, rūšiavimą ir degalus (energiją) taupantį vairavimą (Nordlund ir Garvill, 2003; van der Werff ir kt., 2013b, 2014b). Biosferinės vertybės gali motyvuoti žmones saugoti aplinką (Steg, 2016). Vadinasi, žmonės elgiasi aplinką tausojančiai dėl vidinių

38 Šioje disertacijoje vartojami angliški terminai buvo versti vadovaujantis Bagdono ir Rimkutės (2013) Anglų–lietuvių kalbų psichologijos žodynu (Bagdonas & Rimkutė, 2013). Be to, buvo naudotasi Kembridžo universiteto elektroniniu žodynu, kuriame pateikiami žodžių reikšmių aprašymai, leidžiantys tiksliau įvertinti, koks yra lietuviškas atitikmuo verčiant atitinkamą žodį iš anglų kalbos.

asmeninių priežasčių, pavyzdžiui, patiria prasmingumo jausmą, jaučia, kad elgiasi teisingai ir patiria teigiamų emocijų tausodami aplinką, o ne dėl išorinių paskatų (Bolderdijk ir kt., 2013; Venhoeven ir kt., 2020). Vidinė motyvacija yra ypač svarbi aplinką tausojančiam elgesiui, nes toks elgesys dažnai nėra labai malonus, patogus ar komfortiškas (pvz., važiavimas viešuoju transportu arba dviračiu, o ne automobiliu esant blogam orui), o kartais gali būti brangus (pvz., ekologiškų produktų kainos yra didesnės nei įprastų produktų). Jei žmones motyvuoja vidinės paskatos, jie gali nuosekliai elgtis aplinką tausojančiu būdu, net jei tam nėra patrauklaus išorinio paskatinimo (Bolderdijk ir kt., 2013; de Groot ir Steg, 2010; Lindenberg ir Steg, 2007). Atsižvelgiant į tai, kad aplinką tausojantis elgesys reikalauja pastangų ir ne visada yra malonus, galima manyti, kad toks elgesys neigiamai veikia žmonių gerovę. Tačiau pastebėta, kad tuomet, kai žmonės mano, kad jie apskirtai elgiasi teisingai (Deci ir Ryan, 2008) arba konkrečiai kalbant apie aplinkos saugojimo sritį, jiems tai sukelia teigiamų jausmų (Taufik ir kt., 2015) ir didina gerovės jausmą (Venhoeven ir kt., 2016, 2020). Tokia gerovė vadinama eudaimonine gerove (angl. *eudaimonic wellbeing*): žmonės patiria prasmingumo jausmą, nes daro tai, kas jiems yra reikšminga, tačiau nebūtinai suteikia tiesioginį pasitenkinimą (Ryan ir kt., 2008).[39]

Biosferinės vertybės dažniausiai yra netiesiogiai susijusios su aplinką tausojančiu elgesiu per tarpinius veiksnius, ypač **aplinkosauginį tapatumą** (van der Werff ir kt., 2014b). Aplinkosauginis tapatumas atspindi tai, kiek žmogus mato save kaip aplinką tausojantį žmogų (van der Werff ir kt., 2013b). Stipresnis aplinkosauginis tapatumas lemia daugybę aplinką tausojančių elgsenų, tokių kaip rūšiavimas ir aplinkai draugiško transporto kaip kasdienio susisiekimo priemonės naudojimas važiuoti į darbą ir atgal (van der Werff ir kt., 2013b; Whitmarsh ir O'Neill, 2010). Aplinkosauginis tapatumas kyla ne tik iš biosferos vertybių, bet ir iš to, kiek žmogus tausojo aplinką praeityje. Svarbu tai, kad biosferinės vertybės yra gana stabilios laike, ir todėl gali būti sunkiai keičiamos. O aplinkosauginis tapatumas gali būti sustiprintas taikant intervencijas, pavyzdžiui, primenant žmonėms apie jų ankstesnį aplinką tausojantį elgesį (t. y. aplinką tausojantį vairavimo stilių), o tai stiprina žmonių motyvaciją įsitraukti į



39 Santykis tarp aplinką tausojančio elgesio ir eudaimoninės gerovės yra plačiai nagrinėjamas Leonore Amelie Venhoeven daktaro disertacijoje (Venhoeven, 2016).

naujus aplinką tausojančios elgsenos modelius (pvz., mažinti mėsos vartojimą) (van der Werff ir kt., 2013a, 2014a, 2014b).

Biosferinės vertybės ir aplinkosauginis tapatumas yra pagrindiniai bendrieji veiksniai, galintys lemti daugybę skirtingų aplinką tausojančių elgsenų. Kadangi šie veiksniai yra bendri, jie gali turėti įtakos konkrečiam aplinką tausojančiam elgesiui, per tam elgesiui būdingus veiksnius, pavyzdžiui, **asmenines normas elgtis tam tikru aplinką tausojančiu būdu (angl. *personal norms to engage in a certain pro-environmental behavior*)** (van der Werff ir kt., 2013a, 2013b, 2019). Asmeninės normos – tai įvidujinti moralės standartai, išreikšti per moralinio įsipareigojimo jausmą imtis įvairių aplinką tausojančių elgsenų (Schwartz, 1977; Steg ir kt., 2011), pavyzdžiui, noras sumažinti automobilio naudojimą, aplinką tausojančiu būdu pagamintų drabužių rinkimasis ir ketinimai naudoti energiją iš atsinaujinančių šaltinių (Barbarossa ir De Pelsmacker, 2016; Nordlund ir Garvill, 2003; van der Werff ir kt., 2013a). Asmeninės normos yra jungiamoji grandis tarp žmonių biosferinių vertybių, aplinkosauginio tapatumo ir konkretaus aplinką tausojančio elgesio. Asmeninės normos yra svarbios, nes jas galima sustiprinti pasitelkiant asmeninio įsipareigojimo strategiją. Pavyzdžiui, didinant žmonių supratimą apie konkretaus elgesio pasekmes aplinkai ir apie tai, kaip žmonės galėtų pakeisti savo elgesį (žr. van der Werff ir kt., 2019).

Apibendrinus galima teigti, kad biosferinės vertybės gali motyvuoti aplinką tausojantį elgesį, aplinkosauginis tapatumas gali būti sustiprintas, kad paskatintų daugelį aplinką tausojančių elgsenų, o asmeninės normos yra moraliniai įsipareigojimai imtis konkretaus aplinką tausojančio elgesio. Kuo stipresnės žmogaus biosferinės vertybės, tuo stipresnis yra aplinkosauginis tapatumas. Biosferinės vertybės ir aplinkosauginis tapatumas stiprina asmenines normas veikti aplinką tausojančiu būdu, o kartu jos lemia skirtingą aplinką tausojantį elgesį. Pirminiai įrodymai siūlo, kad visa ši santykių grandinė galėtų paaiškinti aplinką tausojantį elgesį darbe, dalyvavimą atsinaujinančios energijos projektuose ir turistų aplinką tausojantį elgesį (1 pav.; Ruepert ir kt., 2016; van der Werff ir Steg, 2016; Xu ir kt., 2019).

Iki šiol suaugusiųjų susirūpinimo aplinka (išreikšto per biosferines vertybes ir aplinkosauginį tapatumą) ryšys su aplinką tausojančia elgsena daugiausia buvo tiriama VIITD šalyse (Vakarų, išsilavinusiose, industrializuotose, turtingose ir demokratinėse valstybėse; Henrich, Heine ir Norenzayan, 2010). Tad kyla

klausimas, ar susirūpinimas aplinka gali paskatinti aplinką tausojantį elgesį kituose, mažiau ištirtuose, kontekstuose ir ne tik suaugusiųjų imtyje. Jei norima įveiklinti susirūpinimą aplinka, kad būtų skatinamas aplinką tausojantis elgesys plačiu mastu, pirma reikia ištirti ryšį tarp susirūpinimo aplinka ir aplinką tausojančio elgesio mažiau tyrinėtuose kontekstuose tarp skirtingų žmonių, kurie ankstesniuose tyrimuose nebuvo tyrinėti. Siekiant užpildyti šią spragą, disertacijoje tiriama, kiek bendras susirūpinimas aplinka, išreikštas per biosferines vertybes ir aplinkosauginį tapatumą, gali paaiškinti suaugusiųjų Lietuvoje ir paauglių skirtingą aplinką tausojančią elgseną. Lietuva, būdama ekonomiškai išsivysčiusi šalis, kurioje daug išsilavinusių piliečių (EBPO, 2022), susiduria su įvairiais socialiniais, ekonominiais ir demografiniais iššūkiais, galinčiais užkirsti kelią žmonių susirūpinimo aplinka ir aplinką tausojančio elgesio ryšiui susidaryti. Paaugliams kiti veiksniai (pvz., **socialinės normos, angl. *social norms*)**, nesusiję su susirūpinimu aplinka, gali būti svarbesni paaiškinant jų aplinką tausojantį elgesį. Pavyzdžiui, paauglių moralinis įsipareigojimas tausoti aplinką (t. y. asmeninės normos elgtis aplinką tausojančiu būdu) ir aplinką tausojantis elgesys gali būti nulemti susirūpinimo aplinka. Tačiau paauglių asmeninės normos elgtis aplinką tausojančiu būdu gali būti nulemtos ir kitų elgesiui specifiškų veiksnių, tokių kaip socialinės normos, **suvoktas poreikis spręsti aplinkos problemas (angl. *awareness of need*)** ir **suvokiama elgesio kontrolė (angl. *perceived behavioral control*)**. Todėl disertacijoje tiriama, kiek biosferinės vertybės ir aplinkosauginis tapatumas gali paaiškinti paauglių aplinką tausojantį elgesį.

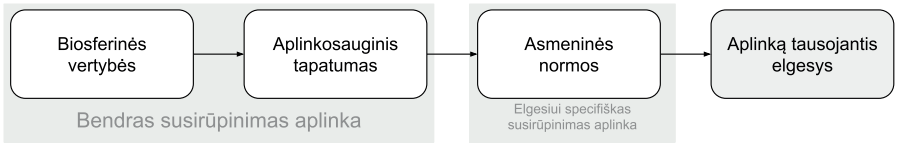
Kitas svarbus klausimas, į kurį siekta atsakyti šioje disertacijoje – kaip formuojasi žmonių susirūpinimas aplinka. Žmogaus vertybės ir tapatumas pradeda formuotis ankstyvame amžiuje (Manfredo ir kt., 2017; Olkinuora, 1972; S. H. Schwartz, 1977; Xie ir kt., 2019), todėl šeimai gali tekti svarbus vaidmuo formuojantis susirūpinimui aplinka (Evans ir kt., 2018; Grønhøj ir Thøgersen, 2009). Šioje disertacijoje dėmesys sutelktas į tėvus ir jų paauglius vaikus. Viena vertus, tėvai ir vaikai gali daryti įtaką vieni kitų susirūpinimui aplinka ir aplinką tausojančiam elgesiui. Antra vertus, dėl su amžiumi susijusių aspektų paaugliai gali siekti atsiriboti nuo savo tėvų prieštaraudami jų vertybėms ir moralinėms normoms. Todėl disertacijoje tikrinama, *ar* ir *kaip* stipriai susijęs tėvų ir jų paauglių vaikų susirūpinimas aplinka.

Ankstesni tyrimai aplinkos psichologijos srityje, tiriantys aplinką tausojantį elgesį lemiančius veiksnius Lietuvoje, daugiausiai dėmesio skyrė speci-

finiams elgesį paaiškinantiems veiksniams (Jovarauskaitė, 2020; Poškus, 2019) arba nagrinėjo, kiek elgesiui specifiški veiksniai paaiškina tam tikrą konkretų elgesį (Jovarauskaitė, 2020). Ši disertacija išplečia ankstesnius tyrimus ir tiria, kiek bendras susirūpinimas aplinka gali paaiškinti daugelį aplinką tausojančių elgsenų.

Žinios apie tai, kurie veiksniai skatina žmones tausoti aplinką, yra ypač svarbios politikos formuotojams, aplinkosaugos aktyvistams, pedagogams, bendruomenėms, nevyriausybinėms organizacijoms ir visiems, ieškantiems su klimato krize susijusių problemų sprendimo būdų. Nustačius veiksnius, kurie universaliai skatina įvairių žmonių aplinką tausojantį elgesį skirtinguose kontekstuose, galima padėti įveikti klimato krizę. Siekiant patenkinti šį poreikį, disertacija pateikia svarbių žinių praktikams. Joje dalinamasi įžvalgomis, kiek susirūpinimas aplinka gali paaiškinti įvairų aplinką tausojantį elgesį Lietuvoje suaugusiųjų ir paauglių populiacijoje; kaip gerai susirūpinimas aplinka paaiškina aplinką tausojantį elgesį, palyginti su kitais elgesiui specifiškais veiksniais; ir kiek susirūpinimas aplinka gali būti svarbus skatinant aplinką tausojantį elgesį šeimoje.

**1 pav.** Ryšys tarp susirūpinimo aplinka ir aplinką tausojančio elgesio




*Pastaba*. Sudaryta autorės pagal van der Werff ir Steg (2016)

### 1.1.1 Aplinkosauginio tapatumo atskyrimas nuo kitų konstruktų, atspindinčių žmogaus ir aplinkos santykį

Aplinkosauginis tapatumas yra jungiamoji grandis tarp biosferinių vertybių ir specifinių aplinką tausojančių elgsenų (van der Werff ir kt., 2013b). Aplinkosauginis tapatumas, kylantis iš biosferinių vertybių, atspindi vidinę žmogaus motyvaciją elgtis aplinką tausojančiai. Be biosferinių vertybių, aplinkosauginiam tapatumui įtakos turi ir žmogaus praeities elgesys (van der Werff ir kt., 2014a). Dėl to aplinkosauginis tapatumas yra lankstesnis ir labiau

kintantis jį paveikus intervencija, palyginus su biosferinėmis vertybėmis, kurios yra gana stabilios laike ir sunkiai keičiamos (Milfont ir kt., 2016; Schwartz, 2012b). Pavyzdžiui, priminus žmonėms apie jų praeityje buvusį aplinką tausojantį elgesį (pvz., degalus taupantį vairavimo stilių), sustiprėjo jų aplinkosauginis tapatumas, o tai toliau lėmė stipresnius ketinimus tausoti aplinką (pvz., sumažinti mėsos vartojimą; van der Werff ir kt., 2014b). Svarbu tai, kad aplinkosauginio tapatumo stiprinimas, primenant žmonėms apie jų konkrečią aplinką tausojančią elgseną, buvusią praeityje, gali išplisti į kitą aplinką tausojantį elgesį. Todėl aplinkosauginis žmogaus tapatumas yra esminis veiksnys, paaiškinantis aplinką tausojantį elgesį; tai suteikia galimybę taikyti intervencijas, skatinančias tokį elgesį (van der Werff ir kt., 2014a).

Literatūroje galima aptikti ir kitų konstruktų, kurie panašiai kaip ir aplinkosauginis tapatumas atskleidžia, kaip **žmonės suvokia save per santykį su aplinka (angl. *human-environment relationship*)**[40], ypač per ryšį su gamta; **ryšys su gamta (angl. *connectedness with nature*)** rodo, kiek žmogus suvokia save kaip gamtos dalį (Schultz, 2002). Kitas panašus konstruktas yra **aplinkos tapatumas (angl. environmental identity)**, atspindintis žmogaus jausmą, kad jis yra susijęs su tam tikromis natūralios aplinkos dalimis (Clayton, 2003). Savęs suvokimas kaip natūralios aplinkos dalies arba per ryšį su natūralia aplinka taip pat gali būti siejamas su aplinką tausojančiu elgesiu, nes žmonės gali norėti veikti remiantis šia savo tapatumo dalimi (Bruni ir kt., 2021; Martin ir Czellar, 2017; Nisbet ir kt., 2009). Tačiau aplinkosauginis tapatumas skiriasi nuo šių konstruktų ir yra svarbiausias norint suprasti ir keisti įvairų žmonių aplinką tausojantį elgesį. Taip teigiama todėl, kad šie trys konstruktai, parodantys žmogaus ryšį su gamta, gali aktyvuoti du skirtingus motyvus tausoti gamtą. Pavyzdžiui, asmens pojūtis, kad jis yra susijęs su natūralia aplinka ar jos dalimis (t. y. ryšys su gamta ir aplinkos tapatumas), nebūtinai gali paskatinti nuoseklų įsitraukimą į daugelį aplinką tausojančių elgsenų. Greičiausiai taip yra todėl,



40 Literatūroje vartojamas ir kitas terminas – žmogaus ir gamtos ryšys (angl. *human-nature relationship*), reprezentuojantis įvairius žmonių ir aplinkos ryšį apibūdinančius konstruktus. Terminas žmogaus ir gamtos ryšys vartojamas antrame skyriuje, kad būtų laikomasi nuoseklumo su literatūra šia tema. Tačiau neabejotinai sąvoka „žmogaus ir aplinkos ryšys“ yra tikslesnė, nes ji rodo ne tik tai, kiek žmonės jaučiasi susiję su gamta, bet ir su aplinka apskritai. Žmonės gali siekti tausoti ne tik natūralią aplinką, bet ir gerinti supančios aplinkos kokybę. Pavyzdžiui, sumažinti $CO_2$ emisijas arba pereiti prie švarios energijos šaltinių.

kad žmonės gali tausoti aplinką tokiais būdais, kurie yra susiję su natūralios aplinkos išsaugojimu, bet ne kita aplinką tausojančia elgsena (van der Werff ir kt., 2013b). Be to, žmonės, pasižymintys tvirtu aplinkosauginiu tapatumu ir besielgiantys aplinką tausojančiu būdu, nebūtinai tai daro, todėl, kad jaučia ryšį su natūralia aplinka. Todėl šioje disertacijoje svarbu išgryninti, kuo aplinkosauginis tapatumas skiriasi nuo kitų panašių konstruktų ir kuo jis yra unikalus aiškinant ir keičiant aplinką tausojančią elgseną. Siekiant šio tikslo nagrinėjami aplinkosauginio tapatumo, ryšio su natūralia aplinka ir aplinkos tapatumo konceptualūs ir empiriniai skirtumai. Idėja, kad aplinkosauginis tapatumas yra konceptualiai atskiras teorinis konstruktas nuo kitų teorinių sampratų, reprezentuojančių žmogaus ir aplinkos ryšį, literatūroje jau buvo iškelta anksčiau (Olivos ir Clayton, 2017; van der Werff ir kt., 2013b). Tačiau šie skirtumai nebuvo sistemingai tiriami, todėl tą spragą siekiama užpildyti šioje disertacijoje. Antrame disertacijos skyriuje atliekama sisteminė literatūros apžvalga apie žmogaus ir aplinkos ryšį aiškinančius konstruktus, bandant nustatyti jų bendrumus ir skirtumus. Siekiant gauti įžvalgų apie šių konstruktų empirinius skirtumus, vertintas ir ryšio stiprumas.

#### *1.1.1.1 Antro skyriaus metodų ir rezultatų apžvalga*

Antrame skyriuje nagrinėjami konceptualūs ir empiriniai skirtumai tarp aplinkosauginio tapatumo, ryšio su gamta ir aplinkos tapatumo. Koreliacijos koeficiento dydžio įvertinimas yra vienas iš būdų nustatyti, ar konstruktai yra panašūs, ar vis dėlto skiriasi. Kuo aukštesnis koreliacijos koeficientas, tuo didesnė tikimybė, kad tiriami konstruktai yra panašūs, ir atvirkščiai. Be to, apžvelgti ir teoriniai argumentai, kuo žmogaus ir aplinkos ryšį rodantys konstruktai skiriasi vienas nuo kito ir kuo jie yra panašūs. Taigi šiame darbe tiriama, kaip stipriai yra susiję nagrinėjami konstruktai ir kaip šis ryšys vertinamas teorijoje (Campbell ir Fiske, 1959). Siekiant išanalizuoti panašumus ir skirtumus atlikta sisteminė šių trijų konstruktų literatūros apžvalga ir analizė. Toliau atlikta metaanalizė šių trijų konstruktų ryšiui ištirti. Iš teorinės analizės rezultatų ($k = 14$) daroma išvada, kad aplinkosauginis tapatumas, ryšys su gamta ir aplinkos tapatumas atspindi, kaip žmonės supranta savo ir aplinkos ryšį. Esminis skirtumas yra tas, kad ryšio su gamta ir aplinkos tapatumo konstruktai parodo, kaip žmonės supranta savo ir natūralios aplinkos ar jos dalių ryšį. Tuo tarpu aplinkosauginis tapatumas rodo, ar žmonės suvokia save kaip aplinką tausojančius asmenis. Stiprus aplinkosauginis

tapatumas gali paskatinti aplinką tausojantį elgesį, nepaisant to, ar žmonės laiko save natūralios aplinkos dalimi, ar ne. Dėl šios priežasties aplinkosauginis tapatumas yra vertingas elgesio intervencijų kontekste. Metaanalizės rezultatai ($N$ = 8513) atskleidė stiprų ryšį tarp ryšio su gamta ir aplinkos tapatumo konstruktų ($r$ = .75 [.67, .83], $k$ = 11, $n$ = 4087), o sąsajos tarp ryšio su gamta ir aplinkosauginio tapatumo ne tokios stiprios ($r$ = .57 [.31, .84], $k$ = 5, $n$ = 4426)[41]. Rezultatai rodo, kad, nepaisant teigiamų ir statistiškai reikšmingų ryšių, yra tam tikras empirinis skirtumas tarp aplinkosauginio tapatumo ir ryšio su gamta, kaip tvirtinama ir teorijoje. Reikšmingas teigiamas ryšys tarp ryšio su gamta ir aplinkosauginio tapatumo nestebina, nes abu konstruktai rodo, kaip žmonės supranta savo ir aplinkos ryšį.

### 1.1.2 Susirūpinimo aplinka ir aplinką tausojančio elgesio ryšys Lietuvoje

Iki šiol ryšio tarp susirūpinimo aplinka ir aplinką tausojančio elgesio tyrimai dažniausiai buvo atliekami VIITD šalyse. Pirminiai įrodymai iš kitų nei VIITD šalių leidžia daryti prielaidą, kad susirūpinimas aplinka gali paaiškinti aplinką tausojantį elgesį ir ne VIITD šalyse. Biosferinės vertybės buvo susijusios su įvairiomis asmeninėmis normomis įsitraukti į aplinką tausojančią elgseną Vengrijoje (pvz., asmeninė norma mažinti automobilio naudojimą; de Groot ir kt., 2012). Be to, biosferinės vertybės per asmenines normas prognozavo energijos taupymą ir ketinimus sumažinti automobilių naudojimą Argentinoje (Jakovcevic ir Reyna, 2017; Jakovcevic ir Steg, 2013), energijos taupymą Turkijoje (Sahin, 2013) ir pritarimą automobilių naudojimo mažinimo politikai Rusijoje (Ünal ir kt., 2019). Tačiau nė viename iš šių tyrimų nebuvo tirta, kiek susirūpinimas aplinka (t. y. biosferinės vertybės ir aplinkosauginis tapatumas) yra susijęs su aplinką tausojančiu elgesiu; aplinkosauginis tapatumas šiuose tyrimuose nebuvo nagrinėjamas. Vis tik aplinkosauginis tapatumas gali būti esminis veiksnys aplinką tausojančio elgesio skatinimo intervencijų kontekste (žr. 1.1 skyrių). Viename iš tyrimų buvo nustatyta, kad kuo stipresnės žmogaus biosferinės vertybės, tuo daugiau žmogus suvokia save kaip asmenį, perkantį energiją taupančius prietaisus, o tai savo ruožtu Vietname buvo susiję su energiją

41 Sisteminė literatūros apžvalga neleido identifikuoti duomenų, kurie matuoti ryšį tarp aplinkosauginio tapatumo ir aplinkos tapatumo.

taupančių prietaisų įsigijimu (Nguyen ir kt., 2016). Kadangi aplinkosauginis tapatumas buvo matuojamas labai konkrečiu lygiu (t. y. „Kai perku energiją taupančius prietaisus, jaučiu, kad esu aplinkai draugiškas vartotojas“), nėra aišku, kiek tai projektuotų kitas aplinką tausojančias elgsenas. Be to, visi čia minėti tyrimai analizavo vieną ar keletą konkrečių aplinkai draugiškų elgsenų, o ne daugybę skirtingų elgesio būdų. Taigi kyla klausimas, kiek bendras susirūpinimas aplinka yra universalus paaiškinti daugybę aplinką tausojančių elgsenų įvairiose šalyse. Į šį klausimą ir siekiama atsakyti šioje disertacijoje. Trečiame skyriuje tiriama, ar biosferinės vertybės ir aplinkosauginis tapatumas gali paaiškinti įvairias suaugusiųjų aplinką tausojančias elgsenas Lietuvoje.

Sąvoka VIITD šalys buvo sukurta siekiant pabrėžti, kad įvairių disciplinų, įskaitant ir socialinius mokslus, studijos dažniausiai remiasi pavyzdžiais iš vakarietiškų, išsilavinusių, pramoninių, turtingų ir išsivysčiusių šalių, dažniausiai iš Vakarų Europos ir JAV (Ghai, 2021; Henrich ir kt., 2010). Ženkliai rečiau yra tyrinėjamos mažiau turtingos šalys arba šalys, kuriose politikos formuotojai dar tik pradeda svarstyti galimybes visuotinai skatinti aplinką tausojantį elgesį. VIITD šalyse atlikti tyrimai rodo, kad susirūpinimas aplinka paaiškina įvairią aplinką tausojančią elgseną (pvz., energijos taupymą, aplinkosauginį aktyvizmą; Ruepert ir kt., 2016; van der Werff ir Steg, 2016). Tačiau tikėtina, kad susirūpinimas aplinka paaiškina aplinką tausojantį elgesį tik VIITD šalyse, kuriose žmonės neturi spręsti kitų didelių problemų, tokių kaip socialinės (pvz., didelis skurdo lygis), demografinės (pvz., intelektinio kapitalo nutekėjimas iš šalies) ir ekonominės (pvz., nedarbas). Žmonės, patiriantys minėtas problemas, gali tausoti aplinką visai dėl kitų priežasčių, o ne todėl, kad yra dėl jos susirūpinę. Pavyzdžiui, žmonių elgesį gali lemti susirūpinimas ekonominiais klausimais. Svarstydami rūšiuoti savo buitines atliekas ar ne, žmonės gali sutelkti dėmesį į finansines pasekmes (pvz., ar rūšiuoti yra pigiau nei nerūšiuoti), o ne pasekmes aplinkai. Dėl to susirūpinimas aplinka gali būti silpnai susijęs arba visai nesusijęs su aplinką tausojančiu žmonių elgesiu. Pažymėtina, kad VIITD šalys sudaro 12 proc. visų pasaulio gyventojų, o tai rodo, kad tyrimų, atliktų tokiose šalyse, išvados padeda suprasti tik nedidelę pasaulio populiacijos dalį (Henrich ir kt., 2010). Tokių šalių rezultatai nebūtinai gali būti prasmingi formuojant politiką kitose šalyse ir kituose kontekstuose. Tačiau dėl klimato krizės visame pasaulyje reikia bendrų veiksmų, o jai sušvelninti reikia konkrečioms šalims skirtų strategijų, todėl būtina geriau suprasti pagrindinius veiksnius, lemiančius

aplinką tausojančią elgseną įvairiose šalyse, ypač tuose regionuose, kurie iki šiol nebuvo tyrinėti.

Šiame doktorantūros darbe nagrinėjamas susirūpinimo aplinka ir aplinką tausojančios elgsenos ryšys Lietuvoje – Baltijos regiono šalyje, kuri dešimtmečius buvo okupuota Sovietų Sąjungos. Per šį laikotarpį Lietuvoje nuolat trūko įvairių išteklių – nuo maisto iki drabužių ir namų apyvokos daiktų, todėl gali būti, kad didesnę reikšmę žmonės galėjo teikti ekonominiams klausimams, o ne kitiems rūpesčiams, pavyzdžiui, aplinkos apsaugai. Šiuo metu EBPO Lietuvą vertina kaip ekonomiškai išsivysčiusią šalį (Demmou, 2016), todėl galima teigti, kad Lietuva tėra dar viena VIITD šalis. Vis tik EBPO ekspertai pabrėžia, kad Lietuva susiduria su unikaliu socialinių, demografinių ir ekonominių problemų rinkiniu, nebūdingu VIITD šalims (Demmou, 2016). Šios problemos apima, bet neapsiriboja, vienais aukščiausių savižudybių rodiklių pasaulyje (PSO, 2021), dideliu gyventojų skaičiumi, kuriems gresia skurdas ir socialinė atskirtis[42] (šalies mastu – 25 proc., kaimo vietovėse – 32 proc.), vienomis mažiausių pajamų tarp ES šalių, didžiuliu gerovės atotrūkiu tarp miesto ir kaimo vietovių, aukštu nedarbo lygiu kaimo vietovėse (nedarbas šalies mastu – 15 proc., kaimo vietovėse – 23 proc.), dideliu emigracijos lygiu ir intelektinio kapitalo nutekėjimu iš šalies[43] (Eurostatas, 2022b, 2022a; Okunevičiūtė-Neverauskienė ir Pocius, 2019; OSP, 2020a, 2022; Pociūtė-Sereikienė, 2019; Ubarevičienė ir van Ham, 2017; UT, 2021). Poreikis spręsti šias problemas gali skatinti žmones teikti pirmenybę kitiems aspektams, užuot rūpinusis aplinka. Tai gali lemti silpnesnį ryšį tarp susirūpinimo aplinka ir aplinką tausojančios elgsenos Lietuvos gyventojų imtyje. Čia ir dabar kylančios praktinės problemos, tokios kaip išlaidos, gali būti svarbesnės nusprendžiant, bus įsitraukiama į aplinką tausojantį elgesį ar ne. Paklausti, kokios problemos jiems rūpi labiausiai, 68



42 Skurdo ir socialinės atskirties grėsmės rodiklis yra tokių rodiklių, kaip skurdo rizika, didelis materialinis ir socialinis nepriteklius ir gyvenimas namų ūkyje, kuriame darbo intensyvumas labai mažas, suma. Tokių rodiklių pavyzdžiai yra mažos mėnesinės pajamos, negalėjimas nusipirkti tam tikrų daiktų ar socialinės veiklos, kai dirbama mažiau nei 20 proc. potencialaus darbo laiko per metus (Eurostat, 2021).

43 Nuo 1989 m. iki 2015 m. Lietuvos gyventojų skaičius sumažėjo nuo 3,7 mln. iki 2,9 mln.; tai didžiausias nuosmukis visų pasaulio šalių kontekste (Ubarevičienė ir van Ham, 2017; Jungtinės Tautos – DESA, 2015). Gyventojų skaičiaus mažėjimas ypač ryškus regionuose už didžiųjų miestų ribų. Regionus dažniausiai palieka jaunesni, aukštąjį išsilavinimą turintys gyventojai (OSP, 2020b; Ubarevičienė ir van Ham, 2017).

proc. Lietuvos piliečių nurodė ekonomines problemas (pvz., kylančios kainos, infliacija ir pragyvenimo išlaidos), o tik 1 proc. – aplinkosaugos problemas (pvz., klimato kaita ir energetikos klausimai) (Eurobarometer, 2018). Be to, tyrimai iš tiesų rodo, kad Lietuvoje yra vis dar labai stiprios materialinės vertybės (Inglehart, 2018), o pirmumo Lietuvoje teikimas materialinėms vertybėms potencialiai gali slopinti susirūpinimo aplinka ir aplinką tausojančio elgesio ryšį (Hurst ir kt., 2013; Wang ir kt., 2019).

Svarbu tirti veiksnius, skatinančius aplinkai draugišką elgesį Lietuvoje, nes šalis susiduria su rimtomis aplinkosaugos problemomis, kurių mastas didėja. Problemų pavyzdžiai yra oro tarša, vandens tarša pramonės atliekomis, miškų naikinimas ir biologinės įvairovės nykimas (EEA, 2020; EPHA, 2018; GFW, 2022). Iki šiol politikos priemonės, skatinančios aplinką tausojančią elgseną Lietuvoje, siekė elgesį padaryti prieinamu ir praktiškai naudingu, o aplinką žalojantį elgesį – nenaudingu ar brangiu, pavyzdžiui, rūšiavimo ir perdirbimo infrastruktūros diegimas, dviračių takų įrengimas, finansinių paskatų, tokių kaip perdirbtų butelių ir skardinių užstato sistemos kūrimas ir taršių technologijų apmokestinimas (Europos aplinkos agentūra, 2015; Pakuočių ir pakuočių atliekų perdirbimo įstatymas, 2001). Infrastruktūros kūrimas yra pirmasis būtinas žingsnis skatinti aplinką tausojantį elgesį. Tačiau šios priemonės galėtų būti veiksmingesnės, jei būtų atsižvelgta į žmonių motyvus naudotis šia infrastruktūra. Išskirtinis dėmesys aplinką tausojančio elgesio sąnaudoms atkreipia žmonių dėmesį į praktinius aspektus, o ne į aplinkosaugos problemas. Tai gali sumažinti intervencijos veiksmingumą ir sumažinti tikimybę, kad žmonės tausos aplinką todėl, kad ji jiems rūpi (Bolderdijk ir kt., 2013). Susirūpinimo aplinka ryšys su aplinką tausojančiu elgesiu Lietuvoje iki šiol netirtas. Tad kyla klausimas, ar susirūpinimas aplinka gali paaiškinti aplinką tausojantį elgesį Lietuvoje? Toks tyrimas galėtų suteikti pirmąsias įžvalgas apie tai, ar verta orientuotis į susirūpinimą aplinka intervencijose, kuriomis siekiama skatinti aplinką tausojantį elgesį.

#### *1.1.2.1 Trečio skyriaus metodų ir rezultatų apžvalga*

Trečiame skyriuje buvo atliktas skerspjūvio tyrimas, pasirinkus patogiąją imtį Lietuvoje (334, 79,6% moterų, $M_{age}$ = 34,28, $SD_{age}$ = 12,28). Tikėtina, kad iš dalies šią imtį galima palyginti su bendra populiacija. Europos socialinis tyrimas (ESS-ERIC, 2020), kuriame naudojami reprezentatyvūs nacionaliniai duomenys,

atliktas praėjus keliems mėnesiams po dabartinio tyrimo. Tyrimas parodė, kad Europos socialiniame tyrime panaši procentinė dalis (55,9 proc.) Lietuvos žmonių kaip ir šiame tyrime (61,8 proc.) manė, kad labai svarbu tausoti gamtą ir aplinką[44]. Šioje disertacijoje naudoti tyrimų lauke įsitvirtinę tyrimų instrumentai vertinant žmonių susirūpinimą aplinka ir aplinką tausojantį elgesį. Biosferinės vertybės buvo matuotos pasirinkus trumpąją Schwartzo vertybių skalės versiją (Schwartz, 1992, 1994), kurią pritaikė De Groot ir Steg (2007), aplinkosauginis tapatumas – van der Werff ir kolegų sukurta skale (van der Werff ir kt., 2013a, 2013b), o įvairi aplinką tausojanti elgsena – naudojant Bendrojo ekologinio elgesio instrumento klausimus (Kaiser ir Wilson, 2004). Struktūrinis lygčių modeliavimas (angl. *Structural equation modeling* – SEM) naudotas biosferinių vertybių, aplinkosauginio tapatumo ir aplinką tausojančios elgsenos ryšiams patikrinti. Atskleista, kad žmonių susirūpinimas aplinka buvo teigiamai susijęs su rūšiavimo ir aplinkosauginiu aktyvizmu, bet nebuvo susijęs su degalus taupančiu vairavimo stiliumi ir aplinkai draugiško transporto naudojimu. Daroma išvada, kad ir Lietuvoje susirūpinimas aplinka gali paaiškinti aplinką tausojantį elgesį, tačiau kai kuriai elgsenai pasireikšti gali trukdyti tam tikros kliūtys, esančios aplinkoje. Tikėtina, kad jos trukdo žmonėms veikti susirūpinus aplinka.

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### 1.1.3 Susirūpinimas aplinka paauglystėje

Susirūpinimo aplinka komponentai – biosferinės vertybės ir aplinkosauginis tapatumas gali paaiškinti suaugusiųjų aplinką tausojantį elgesį (Ruepert ir kt., 2016; van der Werff ir Steg, 2016). Tačiau nežinoma, ar šie rezultatai gali būti apibendrinti ir kitoms amžiaus grupėms. Ypač svarbi grupė yra paaugliai, nes jie išgyvena tik šiai konkrečiai amžiaus grupei būdingus vystymosi dėsningumus, tokius kaip išaugusi bendraamžių svarba priimant sprendimus ir pasirenkant,

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44 Europos socialiniame tyrime biosferinės vertybėms buvo matuotos vienu klausimu. Buvo nustatyta, kad 55,9% dalyvių sutiko su teiginiu „Svarbu rūpintis gamta ir aplinka“. Šį procentą skaičiavome tik iš atsakymų, kuriuose buvo išreikštas tvirtas įsitikinimas (t. y. „Labai panaši (-us) į mane“ ir „Panaši (-us) į mane“), kad svarbu rūpintis gamta. Disertaciniame tyrime biosferines vertybes matavome keturiais klausimais (pvz., „Aplinkos apsauga ir gamtos išsaugojimas“). Kaip ir pirmu atveju, procentą skaičiavome tik iš atsakymų, kuriuose buvo išreikštas tvirtas įsitikinimas (t. y. „Ypatingai svarbu“ ir „Labai svarbu“), kad svarbu rūpintis gamta  Galutinis procentas buvo apskaičiuotas  išvedus bendrą svidurkį.

kaip elgtis vienu ar kitu klausimu (Albert ir kt., 2013). Bendraamžių įtaka gali būti svarbesnis veiksnys už susirūpinimą aplinka. Pavyzdžiui, bendraamžių (draugų, mokyklos draugų, romantinių partnerių) vaidmuo paauglių elgesiui itin svarbus (Albert ir kt., 2013; Lansford ir kt., 2009). Jei paaugliams reikšmingų bendraamžių grupė tausos aplinką (pvz., dalyvaus protestuose prieš klimato kaitą), tikėtina, kad toks elgesys taps paauglių asmenine norma elgtis aplinką tausojančiu būdu (Pinho ir kt., 2021), ir jie elgsis panašiai, kaip elgiasi bendraamžiai (Collado ir kt., 2017). Tačiau neaišku, ar elgesį lems noras sekti bendraamžių susirūpinimu aplinka, ar visgi paaugliai vadovausis savo asmeniniu susirūpinimu aplinka. Paauglių elgesį gali motyvuoti poreikis padaryti įspūdį bendraamžiams, vadinamasis poreikis įtvirtinti savo statusą bendraamžių grupėje (Li ir Wright, 2014), bet ne poreikis veikti pagal savo moralinį įsipareigojimą tausoti aplinką (t. y. asmenines normas; van der Werff ir kt., 2013a). Pavyzdžiui, į mokyklą galima važiuoti įmantriu dviračiu, norint pasipuikuoti prieš draugus ar padaryti jiems įspūdį, bet ne dėl noro mažinti oro taršą. Dėl panašios priežasties galima pirkti moderniausius elektroninius prietaisus, nors naudoti atnaujintą nenaują prietaisą būtų geriau aplinkai. Be to, susirūpinimas aplinka gali būti ne pagrindinis veiksnys, motyvuojantis aplinką tausojantį elgesį. Pavyzdžiui, galima išties jausti stiprų susirūpinimą aplinka, tačiau vis tiek pirkti brangų vandenį buteliuose, nes priešingu atveju, papildęs gertuvę vandeniu iš čiaupo, paauglys neatrodys deramai draugų akyse. Dėl veiksnių, kurie gali būti svarbūs paaugliams, gali nutikti taip, kad susirūpinimas aplinka menkai paaiškins aplinką tausojantį elgesį. Atsižvelgiant į tai, kad kiti veiksniai gali veikti paauglių aplinką tausojantį elgesį, kyla klausimas, kiek apskritai biosferinės vertybės, aplinkosauginis tapatumas ir asmeninės normos paaiškina jų elgesį?

Paauglių vertybės, tapatumas ir normos vis dar formuojasi (Klimstra ir kt., 2010; Meeus ir kt., 2010; Vecchione ir kt., 2019), tad dar tik formuojasi ir paauglių susirūpinimas aplinka. Tyrimai rodo, kad paauglystėje yra teikiama mažesnė svarba susirūpinimo gamta ir aplinka vertybėms bei susirūpinimo kitais žmonėmis vertybėms (universalizmo vertybės) nei vėlesniais gyvenimo tarpsniais (Schwartz, 2012; Vecchione ir kt., 2019). Be to, paauglystėje šios vertybės yra silpnesnės nei savęs stiprinimo vertybės (angl. *self-enhancement values*) (pvz., rūpi pasiekimai ir galia; Schwartz, 2012; Vecchione ir kt., 2019). Paauglių aplinkosauginis tapatumas taip pat gali būti kismo procese; paauglių tapatumas apskritai nėra stabilus, jis nuolat kinta, nes paaugliai tyrinėja savo

tapatumą (Crocetti ir kt., 2008). Asmeninės normos paauglystėje taip pat vis dar formuojasi (Hart ir Carlo, 2005; Malti ir kt., 2021). Tyrimai rodo, kad paaugliai jaučia mažesnį moralinį įsipareigojimą tausoti aplinką, palyginti su jaunesniais vaikais (Krettenauer, 2017). Panaši situacija yra ir kalbant apie paauglių aplinką tausojančią elgseną. Paaugliai rečiau įsitraukia į aplinkos tausojimo veiklas nei vaikai ir suaugusieji (Evans ir kt., 2007; Krettenauer ir kt., 2019; Otto ir kt., 2019; Otto ir Kaiser, 2014; Wray-Lake ir kt., 2017). Atsižvelgus į tai, kad susirūpinimas aplinka paauglystėje vis dar gali formuotis, būtų prasminga šiuo laikotarpiu stiprinti paauglių susirūpinimą aplinka intervencijomis. Tačiau pirmiausia reikia žinoti, ar susirūpinimas aplinka iš tiesų motyvuoja paauglių aplinką tausojantį elgesį.

Iki šiol ryšys tarp paauglių biosferinių vertybių, aplinkosauginio tapatumo, asmeninių normų elgtis aplinką tausojančiu būdu ir aplinką tausojančio elgesio nebuvo tirtas. Nors yra pirminių įrodymų, kad paauglių aplinką tausojantis elgesys ir asmeninės normos elgtis aplinką tausojančiu būdu yra susijusios (Collado ir kt., 2017; Matthies ir kt., 2012), nėra tyrimų, įrodančių, kad paauglių asmeninės normos elgtis aplinką tausojančiu būdu kyla iš biosferinių vertybių ir aplinkosauginio tapatumo. Paauglys gali jausti moralinį įsipareigojimą rūšiuoti atliekas dėl asmeninių priežasčių, pavyzdžiui, norint užsidirbti kišenpinigių iš tėvų. Todėl disertacijoje tiriama, kiek paauglių asmeninės normos elgtis aplinką tausojančiu būdu yra susijusios su biosferinėmis vertybėmis ir aplinkosauginiu tapatumu.

Dėl aukščiau aptartų motyvų (t. y. poreikio elgtis pagal tai, kas rūpi bendraamžiams) aplinką tausojantis paauglių elgesys nebūtinai gali būti susijęs su susirūpinimu aplinka. Todėl disertacijoje tiriama, kiek aplinką tausojantis paauglių elgesys remiasi biosferinėmis vertybėmis, aplinkosauginiu tapatumu ir asmeninėmis normomis elgtis aplinką tausojančiu būdu. Žinios apie tai, kad susirūpinimas aplinka yra susijęs su paauglių aplinką tausojančiu elgesiu, būtų dar vienas įrodymas, kad susirūpinimas aplinka išties yra universalus konstruktas, galintis paaiškinti daugybę aplinką tausojančių elgsenų. Toks atradimas atvertų kelią tolesniems intervenciniams tyrimams, kuriais būtų siekiama skatinti aplinką tausojantį paauglių elgesį, stiprinant jų susirūpinimą aplinka.

#### *1.1.3.1 Ketvirto skyriaus metodų ir rezultatų apžvalga*

Siekiant patikrinti, ar susirūpinimas aplinka gali paaiškinti aplinką tausojantį paauglių elgesį, ketvirtame skyriuje atlikti trys skerspjūvio tyrimai Lietuvos paauglių imtyje (pirmas tyrimas: 256, 54,7% mergaičių, $M_{age}$ = 15,33, $SD_{age}$ = .91; antras tyrimas: 349, 54,7% mergaičių, $M_{age}$ = 16,07, $SD_{age}$ = .99; trečias tyrimas: 905, 54,3% mergaičių, $M_{age}$ = 15,23, $SD_{age}$ = .68). Pagrindiniai kintamieji išmatuoti tais pačiais instrumentais, kurie buvo aptarti 1.1.2.1 poskyryje. Į šį tyrimą įtrauktas elgesiui specifiškas susirūpinimo aplinka konstruktas – asmeninės normos elgtis aplinką tausojančiu būdu (van der Werff ir kt., 2013a, 2013b). Asmeninės normos gali būti svarbus veiksnys, siejantis paauglių biosferines vertybes, aplinkosauginį tapatumą su aplinką tausojančiu elgesiu. Pasitelkiant struktūrinių lygčių modeliavimo techniką buvo tikrinamas ryšys tarp paauglių biosferinių vertybių, aplinkosauginio tapatumo, asmeninių normų ir aplinką tausojančio elgesio. Nustatyta, kad paauglių biosferinės vertybės ir aplinkosauginis tapatumas per asmenines normas buvo susijęs su daugybe aplinką tausojančių elgsenų, tokių kaip rūšiavimas, aplinkai draugiško transporto rinkimasis, aplinkai draugiškų prekių pirkimas ir vandens gėrimas iš čiaupo, užuot pirkus jį plastiko buteliuose. Daroma išvada, kad paauglių susirūpinimas aplinka yra susijęs su aplinką tausojančiu elgesiu per asmenines normas. Šie tyrimai pateikia dar vieną įrodymą, kad susirūpinimas aplinka yra universalus veiksnys, galintis paaiškinti aplinką tausojantį elgesį įvairiuose kontekstuose (t. y. Lietuvoje) ir skirtingų žmonių grupėse (t. y. paauglių).

### 1.1.4 Susirūpinimo aplinka vaidmuo paaiškinant paauglių aplinką tausojantį elgesį kitų veiksnių kontekste

Susirūpinimo aplinka elementai, t. y. biosferinės vertybės ir aplinkosauginis tapatumas, yra bendri veiksniai, galintys paaiškinti daugybę aplinką tausojančių elgsenų per asmenines normas elgtis tam tikru aplinką tausojančiu būdu. Tačiau susirūpinimas aplinka nebūtinai lems aplinką tausojantį elgesį, nes jam įtakos gali turėti ir kiti elgesiui specifiški veiksniai, kurie gali būti ypač svarbūs paauglystėje. Pavyzdžiui, socialinės normos, suvoktas poreikis spręsti aplinkos problemas ir **suvoktos savojo elgesio pasekmės aplinkai (angl. *awareness of consequences*)**, įpročiai, suvokiama elgesio kontrolė ir **elgesio prieinamumas (angl. *access to behavior*)** gali lemti paauglių aplinką tausojantį elgesį. Šie veiksniai yra tyrinėjami *Išsamaus elgesio determinacijos modelio* kontekste –

IEDM **(angl. Comprehensive Action Determination Model – CADM;** Klöckner ir Blöbaum, 2010; Stern, 2000). Tyrimai suaugusiųjų imtyse rodo, kad šie elgesiui specifiški veiksniai lemia įvairią aplinką tausojančią elgseną: aplinkai draugišką keliavimo būdą (renkantis viešąjį transportą, o ne automobilį), atliekų rūšiavimą, aplinką tausojantį šildymo sistemos pasirinkimą, energijos taupymą ir atliekų rūšiavimą darbe (Klöckner ir Blöbaum, 2010; Klöckner ir Friedrichsmeier, 2011; Klöckner ir Oppedal, 2011; Ofstad ir kt., 2017; Sopha ir Klöckner, 2011; van den Broek ir kt., 2019). Toliau aptariama, kaip šie elgesiui specifiški veiksniai paaiškina paauglių aplinką tausojantį elgesį. Be to, aptariama būtinybė suprasti, kaip gerai susirūpinimas aplinka paaiškina aplinką tausojantį elgesį, palyginus su elgesiui specifiškais veiksniais.

Asmenines normas elgtis tam tikru aplinką tausojančiu būdu, kaip postuluojama IEDM modelyje, gali paaiškinti ir kiti veiksniai, pavyzdžiui, socialinės normos. Socialinės normos parodo, kiek žmogus suvokia aplinkos spaudimą (ne)tausoti aplinkos (-ą), kitais žodžiais kalbant, kiek žmogus suvokia, kad elgtis aplinką tausojančiu būdu yra priimtina ar nepriimtina jo socialinėje aplinkoje (Fishbein & Ajzen, 2010). Asmenys gali įvidujinti jiems asmeniškai reikšmingų grupių (pvz., bendraamžių) moralinius standartus, paversdami juos savo vidiniais moralės atskaitos taškais – asmeninėmis normomis (Fishbein ir Ajzen, 2010; Schwartz, 1977). Socialinės normos gali būti ypač aktualios paaugliams. Paaugliai yra jautresni nei suaugusieji socialinei įtakai, ypač bendraamžių spaudimui (Albert ir kt., 2013; Pinho ir kt., 2021). Tai rodo, kad socialinės normos elgtis aplinką tausojančiu būdu, kitaip tariant, faktas, kad paauglių pasirinkimus priims arba nepriims bendraamžiai, gali paveikti jų asmenines normas ir galiausiai patį elgesį. Tyrimai suaugusiųjų imtyse rodo ryšį tarp socialinių ir asmeninių normų elgtis aplinką tausojančiu būdu (Haustein ir kt., 2009). Kuo labiau asmuo jaučia, kad jam svarbūs žmonės tikisi, jog jis rinksis aplinką tausojančias transporto priemones, tuo stipriau jis jaučiasi moraliai įsipareigojęs susilaikyti nuo automobilio naudojimo kasdienėms kelionėms į darbą ir atgal ir tuo stipriau jis jaučiasi moraliai įsipareigojęs rinktis aplinkai draugiškas susisiekimo priemones. Pirminiai tyrimai parodė, kad socialinės ir asmeninės normos turi sąsajų tarp tėvų ir jų mažų vaikų (8–10 metų; Matthies ir kt., 2012). Kuo labiau vaikai jaučia, kad tėvai tikisi iš jų atsakingo popieriaus naudojimo, tuo dažniau jie jaučia moralinę pareigą rūšiuoti popieriaus atliekas perdirbimui ar panaudoti jį pakartotinai. Tačiau iki šiol nė viename tyrime nebuvo nagrinėta,

kaip tiksliai susirūpinimas aplinka paaiškina paauglių asmenines normas elgtis aplinką tausojančiu būdu, palyginus su elgesiui specifiškais veiksniais.

Be socialinių normų, asmenines normas elgtis aplinką tausojančiu būdu gali tiesiogiai paveikti žmogaus suvoktas poreikis spręsti aplinkos problemas (Klöckner ir Blöbaum, 2010; Schwartz, 1977). Suvoktas poreikis spręsti aplinkos problemas atspindi asmens žinojimą, kad aplinkai gresia pavojus ir kad tam tikra praktika ar elgesys sukelia problemų (Schwartz, 1977), pavyzdžiui, vienkartinių pirkinių maišelių naudojimas tik gilina aplinkosaugos problemas. Suvoktas poreikis spręsti aplinkos problemas gali sustiprinti moralinį įsipareigojimą elgtis aplinką tausojančiu būdu. Suvoktos asmeninio elgesio pasekmės aplinkai[45] yra dar vienas veiksnys, sietinas su asmeninėmis normomis elgtis aplinką tausojančiu būdu (Klöckner ir Blöbaum, 2010; Schwartz, 1968, 1977). Suvoktos asmeninio elgesio pasekmės aplinkai parodo, kiek asmuo supranta, kad jo elgesys turi teigiamą ar neigiamą poveikį aplinkai (Klöckner ir Blöbaum, 2010; Schwartz, 1968, 1977). Pavyzdžiui, žmonės žino, kad į parduotuvę atsinešę savo pirkinių maišelį tausoja aplinką. Kuo aiškiau žmogus suvokia, kad jo elgesys kenkia kitų gerovei, tuo labiau tikėtina, kad jis jaus moralinį įsipareigojimą sumažinti neigiamą poveikį (Schwartz, 1968). Šias teorines prielaidas patvirtina ir tyrimai. Iš tiesų, suvoktos neigiamos asmeninio automobilio naudojimo pasekmės aplinkai yra susijusios su moraliniu įsipareigojimu rečiau naudotis asmeniniu automobiliu ir pritarimu automobilių naudojimo mažinimo politikai (Klöckner ir Blöbaum, 2010; Ünal ir kt., 2019)[46]. Lietuvoje nėra

45 Kai kuriuose šaltiniuose suvoktos asmeninio elgesio pasekmės aplinkai vadinamos problemos suvokimu (Nordlund ir Garvill, 2003; van der Werff ir Steg, 2015). Disertacijoje teikiama pirmenybė terminui, kurį nurodė Schwartz (1968).

46 Pagrindinis skirtumas tarp suvokto poreikis spręsti aplinkos problemas ir suvoktos savojo elgesio pasekmių aplinkai yra tas, kad pirmasis konstruktas rodo, kiek pripažįstamas poreikis pagerinti aplinkos būklę (pvz., sumažinti plastiko naudojimą siekiant sumažinti plastiko taršą), o antrasis konstruktas rodo, kiek yra suvokiamas tam tikro elgesio ar praktikos poveikis aplinkai (pvz., plastiko naudojimas prisideda prie aplinkos taršos) (Schwartz, 1968, 1977).

sistemingo[47] švietimo aplinkosaugos klausimais, todėl paaugliams gali trūkti supratimo apie esamas aplinkosaugos problemas ir suvokimo, kaip jų elgesys prisideda prie šių problemų. Tai gali neigiamai veikti paauglių asmenines normas elgtis aplinką tausojančiu būdu ir patį elgesį. Šią prielaidą iš dalies patvirtina pirminiai tyrimai suaugusiųjų imtyje. Tyrimai parodė, kad savo elgesio pasekmių suvokimas yra tiesiogiai susijęs su aplinką tausojančiu elgesiu (Haustein ir kt., 2009). Tai rodo, kad asmens supratimas, jog jo elgesys neigiamai veikia aplinką, gali turėti įtakos jo pasirinkimui elgtis ar nesielgti aplinką tausojančiu būdu.

Toliau IEDM modelis apima du situacinius veiksnius, galinčius paskatinti arba slopinti asmens aplinką tausojantį elgesį. Pirmasis veiksnys, suvokiama elgesio kontrolė – tikėjimas, kad žmogus kontroliuoja savo elgesį ir gali elgtis tam tikru būdu (Fishbein ir Ajzen, 2010; Klöckner ir Blöbaum, 2010) – yra susijęs su daugeliu aspektų, kurie gali lemti, tausos paaugliai aplinką ar ne. Tikėtina, kad paaugliai gali kontroliuoti tam tikrą savo elgseną, tačiau ne visą. Pavyzdžiui, už sprendimus apie ekologiškų produktų pirkimą ar transporto vykti į mokyklą pasirinkimą gali būti atsakingi tėvai. Jei paaugliai mano, kad jų galimybės rinktis elgtis tam tikru būdu yra ribotos, tikėtina, kad jie gali jaustis mažiau morališkai įsipareigoję elgtis aplinką tausojančiu būdu. Tyrimai suaugusiųjų imtyje iš tiesų rodo, kad kuo labiau žmonės suvokia, jog ekologiško pieno pirkimas priklauso nuo jų pačių, tuo labiau jie jaučiasi morališkai įsipareigoję pirkti ekologišką



47 Aplinkosauginis švietimas laikomas sisteminiu, kai jis atitinka šiuos kriterijus: padeda ugdyti sąmoningumą ir jautrumą aplinkosaugos klausimams; suteikia žinių apie šių problemų priežastis ir jų ryšį su kitomis socialinėmis problemomis; įgalina žmones formuoti tokį požiūrį, vertybes ir susirūpinimą, kuris teikia pirmenybę aplinkos apsaugai; suteikia atitinkamų įgūdžių atpažinti ir spręsti aplinkosaugos problemas; įgalina žmones spręsti aplinkosaugos problemas (Benedict, 1999; Hungerford ir kt., 1980; UNESCO – Tbilisio deklaracija, 1977). Politikos dokumentų ir teisės aktų analizė rodo, kad aplinkosauginis švietimas Lietuvoje tik labai neseniai sulaukė politikos formuotojų dėmesio. Dažniausiai dėmesys yra skiriamas informuotumui apie aplinkosaugos problemas didinti ir žinioms suteikti (žr. apžvalgą Balundė ir kt., 2021, p. 10). Tačiau, remiantis pateikiama informacija, kol kas nėra numatyta ir nėra įgyvendinama, kaip visuose švietimo lygmenyse – nuo ikimokyklinio iki aukštojo mokslo įstaigų – būtų galima paskatinti žmones labiau tausoti aplinką, remiantis tomis įgytomis žiniomis. Pastangos atliepti kitus aplinkosauginio švietimo komponentus praktikoje yra gana fragmentiškos; šie kiti aplinkosauginio ugdymo komponentai nėra įtraukti į bendrąjį ugdymo turinį (Kavaliauskaitė ir Leščinskaitė, 2019; Poškus ir kt., 2019).

pieną (Klöckner ir Ohms, 2009). Tyrimai taip pat rodo, kad suvokta elgesio kontrolė[48] gali veikti žmogaus ketinimus elgtis aplinką tausojančiu būdu (t. y. kiek žmogus nori ir yra pasirengęs elgtis tam tikru būdu; Fishbein ir Ajzen, 2010). Kuo stipresnė žmogaus suvokiama elgesio kontrolė, tuo stipresni jo ketinimai elgtis aplinką tausojančiu būdu. Pavyzdžiui, žmonės, kurie manė, kad jie kontroliuoja savo pasirinkimą naudotis visuomeninio transporto paslaugomis, kad sumažintų naudojimąsi automobiliais, turėjo stipresnius ketinimus naudotis miesto teikiamomis transporto paslaugomis tiek apsipirkti, tiek važinėti į darbą (de Groot ir Steg, 2007b)[49]. Jei paaugliai mažiau kontroliuoja tam tikrą elgesį, tai gali susilpninti jų ketinimus tausoti aplinką. Suvokta elgesio kontrolė gali būti tiesiogiai susijusi su elgesiu (Klöckner, 2013; Klöckner ir Oppedal, 2011). Kuo aukštesnė žmogaus suvokiama elgesio kontrolė, tuo didesnė tikimybė, kad jis imsis tam tikro aplinkai palankaus elgesio. Antrasis situacinis veiksnys, galintis paaiškinti paauglių aplinką tausojantį elgesį, yra elgesio prieinamumas. Elgesio prieinamumas parodo, kiek lengvai ar sunkiai žmogui yra pasiekiamos priemonės elgtis tam tikru būdu (Klöckner ir Blöbaum, 2010). Paaugliai gali neturėti galimybių tausoti aplinką tam tikru konkrečiu būdu. Pavyzdžiui, kaimo vietovėse gali būti apribota prieiga prie švaraus geriamojo vandens, todėl paaugliai gers vandenį buteliuose, arba pirks supakuotus patiekalus, jei parduotuvėje tiesiog nėra kitokio varianto[50]. Kuo lengviau prieinamas elgesys, tuo stipresnė suvokta elgesio kontrolė ir tuo didesnė tikimybė, kad žmogus elgsis aplinką tausojančiu būdu (van den Broek ir kt., 2019).

Stiprus įprotis – automatiniai veiksmai, susiformavę praeityje dažnose, pasikartojančiose ir stabiliose situacijose (van den Broek ir kt., 2019) – skatina nuoseklų įsitraukimą į aplinką tausojančią elgseną, pavyzdžiui, automobilio

48 Pagrindinis skirtumas tarp elgesio prieinamumo ir suvoktos elgesio kontrolė yra tas, kad pirmasis konstruktas rodo, kiek suvokiamas objektyvus suvaržymas trukdo elgtis tam tikru būdu (pvz., maisto prekių parduotuvėse yra prieinamos nesupakuotos prekės, kad sumažint plastiko naudojimą), o antras konstruktas. parodo, kiek žmogus suvokia savo subjektyvius gebėjimus elgtis tam tikru būdu (pvz., tvirtai jaučia, kad gali imtis veiksmų plastiko naudojimui mažinti).

49 Iš tolimesnių rajonų ar kitų miestų apsipirkti ar į darbą atvykstantys žmonės automobilį palieka miesto įrengtoje aikštelėje ir kelionę tęsia viešuoju transportu.

50 Valstybinės maisto ir veterinarijos tarnybos duomenimis penktadalis Lietuvos namų ūkių naudojasi privačiais vandens gręžiniais, kuriems gresia cheminė ir biologinė tarša (TV3, 2022).

naudojimą kasdien važiuoti į darbą arba energijos taupymą (Haustein ir kt., 2009; van den Broek ir kt., 2019). Įpročiai gali būti ypač svarbūs nuosekliam paauglių aplinką tausojančiam elgesiui pasireikšti. Vieni įpročiai gali geriau prognozuoti paauglių aplinką tausojantį elgesį (pvz., važiavimą dviračiu į mokyklą) nei kiti (pvz., ekologiškų maisto produktų pirkimą). Aukščiau minėti situaciniai veiksniai, suvokiama elgesio kontrolė ir elgesio prieinamumas gali veikti įpročius tausoti aplinką. Turint mintyje tai, kad įprotis dažniausiai yra automatinis veiksmas, situaciniai veiksniai gali būti svarbūs tik tam tikrais atvejais, pavyzdžiui, kai paaugliai mokosi naujo aplinką tausojančio elgesio, tarkime, pratinasi pirkti ekologiškus maisto produktus. Situaciniai veiksniai taip pat gali turėti įtakos įpročiui ir tais atvejais, kai žmogus turi stiprų susiformavusį įprotį, tačiau aplinka pasikeitė ir sutrikdė įprotį. Pavyzdžiui, žmogus turi stiprų įprotį rūšiuoti atliekas, bet persikėlė į naują vietą, kurioje infrastruktūra skiriasi arba jos nėra. Tokiu atveju reikia stipraus jausmo, kad žmogus kontroliuoja savo elgesį ir gali rasti būdų, kaip tęsti rūšiavimą. Panašiai kaip ir situaciniai veiksniai, asmeninės normos gali veikti žmogaus įpročius, kai situacijos pasikeitimas sutrikdo įprastą elgesį. Stipri asmeninė norma tausoti aplinką gali padėti išlaikyti įprotį.

Susirūpinimas aplinka ir elgesiui specifiški veiksniai, aprašyti IEDM, modelyje, paaiškina ketinimus elgtis aplinką tausojančiu būdu. IEDM modelis postuluoja, kad žmonės elgiasi aplinką tausojančiu būdu nesąmoningai – iš įpročio. Modelis taip pat numato, kad yra ir sąmoningesnis kelias elgtis aplinką tausojančiu būdu, einantis per ketinimus elgtis aplinką tausojančiu būdu. Ketinimai yra susiję su aplinką tausojančia elgsena, tačiau jie nebūtinai virsta elgesiu. Net jei žmonės ketina kažkaip elgtis, jie gali dėl vienokių ar kitokių priežasčių nesielgti pagal savo ketinimus. Taip gali nutikti todėl, kad kiti veiksniai gali tiesiogiai veikti elgesį, pavyzdžiui, anksčiau aptarta suvokiama elgesio kontrolė. Ketinimus gali sustiprinti ar susilpninti socialinės ir asmeninės normos elgtis aplinką tausojančiais būdais (de Groot ir Steg, 2007b; van der Werff ir Steg, 2016). Kuo stipriau žmogus jaus, kad jam svarbūs žmonės tikisi iš jo tausoti aplinką, ir kuo labiau jis pats jausis moraliai įsipareigojęs elgtis aplinką tausojančiu būdu, tuo stipresnis bus ketinimas tausoti aplinką. Paauglystėje ketinimus tausoti aplinką gali paveikti paaugliams svarbių artimųjų socialinė įtaka. Ji gali nulemti, ar paauglių ketinimai tausoti aplinką virs elgesiu. Toliau siekiama atskleisti, ar elgesiui specifiniai veiksniai, postuluojami IEDM

modelyje, gali paaiškinti aplinką tausojantį paauglių elgesį taip pat gerai kaip ir susirūpinimas aplinka.

#### *1.1.4.1 Penkto skyriaus metodų ir rezultatų apžvalga*

Penktame skyriuje, atlikus du tyrimus, nagrinėjama, kiek tiksliai susirūpinimo aplinka elementai, biosferinės vertybės, aplinkosauginis tapatumas ir asmeninės normos paaiškina įvairią paauglių aplinką tausojančią elgseną, palyginus su elgesiui specifiškais veiksniais, aptartais IEDM modelyje. Susirūpinimą aplinka atspindintys konstruktai matuoti tais pačiais instrumentais, kurie aprašyti 1.1.2.1 ir 1.1.3.1 poskyriuose. Socialinės normos, suvoktas poreikis spręsti aplinkos problemas ir asmeninio elgesio pasekmės aplinkai, suvokta elgesio kontrolė, aplinką tausojantis elgesys, įpročiai ir ketinimai buvo matuojami užduodant klausimus apie labai konkretų elgesį, pasitelkus instrumentus iš ankstesnių tyrimų (Klöckner ir Friedrichsmeier, 2011; Klöckner ir Ohms, 2009; van der Werff). ir kt., 2013a). Pirmojo tyrimo (349, 54,7% mergaičių, $M_{age}$ = 16, $SD_{age}$ = 1, patogioji imtis) ir antrojo tyrimo (508, 49,0% mergaičių, $M_{age}$ = 15,10, $SD_{age}$ = 1,49, nacionaliniu lygmeniu reprezentatyvi atsitiktinė imtis) rezultatai parodė, kad ir susirūpinimas aplinka, ir elgesiui specifiški veiksniai pakankamai gerai paaiškino vandens buteliuose naudojimą (pirmasis tyrimas), savo maišelio naudojimą apsipirkimo metu ir nenaudojamų daiktų dovanojimą ar pardavimą (antrasis tyrimas). Kiekvienoje šio elgesio grupėje susirūpinimas aplinka paaiškino nuo 34 iki 48 proc. ketinimų ir nuo 15 iki 46 proc. elgesio. Elgesiui specifiški veiksniai paaiškino nuo 33 iki 54 proc. ketinimų ir nuo 35 iki 59 proc. elgesio. Susirūpinimas aplinka ir elgesiui specifiški veiksniai menkai paaiškino nesupakuotų prekių pirkimą – atitinkamai 1 ir 6 proc. Tačiau ketinimus pirkti nesupakuotas prekes gerai paaiškino abi kintamųjų grupės: ir susirūpinimas aplinka (34 proc.), ir elgesiui specifiški veiksniai (38 proc.). Šie rezultatai rodo, kad susirūpinimas aplinka ir elgesiui specifiški veiksniai gali gana panašiai paaiškinti įvairią aplinką tausojančią elgseną. Rezultatai pateikia pirmuosius įrodymus, kad susirūpinimą aplinka atspindintys veiksniai, nors ir yra gana bendri ir nutolę nuo elgesio, paaiškina paauglių elgesį taip pat gerai, kaip ir elgesiui specifiški veiksniai.

### 1.1.5 Ryšys tarp tėvų ir jų paauglių vaikų susirūpinimo aplinka

Šiame skyriuje toliau renkami įrodymai, kad susirūpinimo aplinka elementai yra universalūs paaiškinant įvairų aplinką tausojantį elgesį. Žengiamas žingsnis

į priekį ir pradedamos nagrinėti aplinkybės, kurioms esant, potencialiai gali formuotis paauglių susirūpinimas aplinka ir aplinką tausojantis elgesys. Kadangi šeima yra svarbi struktūra, kurioje gali atsirasti ir formuotis susirūpinimas aplinka (Manfredo ir kt., 2017; Olkinuora, 1972; Schwartz, 1977), tikėtina, kad šeimos nariai galėtų veikti vieni kitų susirūpinimą aplinka ir aplinką tausojantį elgesį. Tėvai galėtų atlikti svarbų vaidmenį formuojant savo paauglių vaikų susirūpinimą aplinka, tačiau vaikai taip pat gali veikti savo tėvų susirūpinimą aplinka. Pirmasis žingsnis, norint patikrinti, ar tėvai ir jų paaugliai vaikai veikia vienas kito susirūpinimą aplinka, yra išsiaiškinti, kiek susirūpinimas aplinka yra susijęs tėvų ir jų paauglių veikų diadose. Kyla klausimas, ar tėvų ir jų paauglių vaikų susirūpinimas aplinka iš tiesų yra susijęs? Šeimos gali skirtis tuo, kiek jose yra skatinamas susirūpinimas aplinka. Kai kuriose šeimose susirūpinimas aplinka gali būti ugdomas, todėl gali būti susijęs su tėvų ir jų paauglių vaikų aplinką tausojančiu elgesiu (t. y. stipria motyvacija tausoti gamtą ir jos išteklius). Tačiau kitose šeimose aplinką tausojantį elgesį gali lemti kiti veiksniai (pvz., praktiniai rūpesčiai – rūšiuojama ne todėl, kad tausotų aplinką, bet todėl, kad rūšiuoti yra pigiau nei nerūšiuoti). Pastarasis scenarijus gali būti ypač aktualus šalyse, kuriose aplinkosaugos klausimai nėra plačiai aptariami. Taigi tėvų ir vaikų santykiai galėtų atlikti esminį vaidmenį formuojant susirūpinimą aplinka ir paverčiant jį aplinką tausojančiu elgesiu. Žinos apie tai, ar tėvų ir jų paauglių vaikų susirūpinimas aplinka yra susijęs, galėtų būti naudingos formuojant politiką, kuria siekiama skatinti aplinką tausojantį elgesį šeimose.



Siekiant ištirti, ar tėvų ir jų paauglių vaikų susirūpinimas aplinka apskritai yra susijęs, dėmesys skiriamas ryšiui tarp biosferinių vertybių, aplinkosauginio tapatumo ir asmeninių normų. Paauglystėje vertybių, tapatumo ir normų raidai įtakos gali turėti šeimos kontekstas (Friedlmeier ir Trommsdorff, 2011; Grønhøj ir Thøgersen, 2009; Knafo ir Galansky, 2008; Roest ir kt., 2009). Paaugliai gali perimti savo šeimoje vyraujančias aplinkosaugines vertybes, tapatumą ir normas. Tai lemtų teigiamą ryšį tarp tėvų bei jų paauglių vaikų susirūpinimo aplinka ir aplinką tausojančio elgesio. Tačiau paaugliai nebūtinai turi atsižvelgti į savo tėvų susirūpinimą aplinka. Tiesą sakant, paaugliai netgi galėtų maištauti prieš savo tėvų vertybes, tapatumą ir asmenines normas. Jie verčiau atsižvelgtų į savo bendraamžių (bendraklasių, draugų ar romantinių partnerių) ar net kitų jiems svarbių žmonių (mokytojų, trenerių, nuomonės formuotojų, aktyvistų, įžymybių) susirūpinimą aplinka. Taigi, jei paaugliai pirmenybę teikia kitų jiems

svarbių žmonių, bet ne tėvų, susirūpinimui aplinka, tai tėvų ir jų paauglių vaikų susirūpinimas aplinka nebus susijęs arba bus susijęs neigiamai. Ir priešingai, jei paaugliai priima savo tėvų susirūpinimą aplinka, jų susirūpinimas aplinka bus susijęs. Siekiant užpildyti šią žinių spragą, reikia išsiaiškinti, ar apskritai tėvų ir jų paauglių vaikų susirūpinimo aplinka elementai, biosferinės vertybės, aplinkosauginis tapatumas ir asmeninės normos yra susiję.

Jei paauglių ir jų tėvų susirūpinimas aplinka iš tiesų yra susijęs, tai galėtų reikšti, kad tėvai ir vaikai gali daryti įtaką vieni kitų susirūpinimui aplinka ir elgesiui. Ir jei šie ryšiai egzistuoja net tarp tėvų ir jų paauglių vaikų (kurie yra linkę maištauti prieš savo tėvų vertybes ir normas), tai sustiprintų įrodymus, kad susirūpinimas aplinka yra universalus veiksnys, paaiškinantis aplinką tausojantį elgesį. Tokios žinios galėtų būti naudingos programoms, skirtoms tėvų ir vaikų aplinką tausojančio elgesio skatinimui, diegti. Tėvų ir jų paauglių vaikų susirūpinimo aplinka skatinimas ypač gali būti aktualus šalyse, kuriose švietimo įstaigos rečiau puoselėja susirūpinimą aplinka.

#### *1.1.5.1 Šešto skyriaus metodų ir rezultatų apžvalga*

Siekiant patikrinti ryšius tarp tėvų ir jų paauglių vaikų susirūpinimo aplinka, atliktas tyrimas reprezentatyvioje Lietuvos paauglių (492, 49,0% mergaičių, $M_{age}$ = 15,11, $SD_{age}$ = 1,39) ir jų tėvų (492, 75,2% moterų, $M_{age}$ = 42,67, $SD_{age}$ = 6,68) imtyje. Susirūpinimas aplinka matuotas tais pačiais instrumentais, kaip nurodyta ankstesniuose poskyriuose. Tikrinta koreliacija, siekiant įvertinti ryšius tarp tėvų ir jų paauglių vaikų susirūpinimo aplinka ir elgesio. Pasitelktas struktūrinių lygčių modeliavimo metodas, kad būtų galima įvertinti, ar susirūpinimas aplinka paaiškina tėvų ir jų vaikų aplinką tausojantį elgesį. Rezultatai parodė ne tik tai, kad susirūpinimas aplinka paaiškino įvairią aplinką tausojančią elgseną tėvų ir paauglių diadose, bet ir buvo stipriai teigiamai susijęs, t. y. buvo nustatytas stiprus ryšys tarp tėvų ir jų paauglių vaikų biosferinių vertybių, aplinkosauginio tapatumo ir asmeninių normų.

## 1.2 Santrauka

Šioje disertacijoje pirmiausia siekiama išsiaiškinti, kiek aplinkosauginis asmens tapatumas skiriasi nuo kitų žmogaus ir aplinkos santykį reprezentuojančių

konstruktų, tokių kaip aplinkos tapatumas ir ryšys su gamta. Tai buvo svarbus žingsnis, nes aplinkosauginis tapatumas yra raktinė jungtis tarp biosferinių vertybių ir aplinką tausojančio elgesio. Toliau siekiama suprasti, ar susirūpinimo aplinka elementai, biosferinės vertybės ir aplinkosauginis tapatumas yra universalūs veiksniai, paaiškinantys įvairią aplinką tausojančią elgseną Lietuvoje ir konkrečiai tarp paauglių. Kai kuriose šalyse be aplinkos problemų žmonės sprendžia kitas socialines, demografines ir ekonomines problemas, galimai turinčias stipresnį, tiesioginį poveikį jų elgsenai. Tokių problemų pavyzdžiai yra socialinė nelygybė, finansiniai sunkumai ir gyventojų skaičiaus mažėjimas kaimo vietovėse. Šios problemos galėtų užkirsti kelią susirūpinimui aplinka veikti aplinką tausojantį elgesį. Paauglystėje elgesiui specifiški veiksniai, tokie kaip socialinės ir asmeninės normos, suvokiama aplinką tausojančio elgesio kontrolė ir supratimas apie savo elgesio poveikį aplinkos problemoms, gali būti svarbesni paaiškinant aplinką tausojantį elgesį nei susirūpinimas aplinka. Be to, net jei žmonės ir yra rimtai susirūpinę aplinka, kiti veiksniai, pvz., infrastruktūros išvystymo lygis ir prieinamumas, gali veikti aplinką tausojantį elgesį ir trukdyti susirūpinimui aplinka virsti elgsena. Žmonės gali neturėti galimybių įsitraukti į konkretų aplinką tausojantį elgesį, nes tam tikrose šalyse gali nebūti geros infrastruktūros, o paaugliai paprasčiausiai gali neturėti galios priimti sprendimus dėl aplinkai draugiškų pirkinių įsigijimo ar transporto priemonės pasirinkimo. Ryšys tarp susirūpinimo aplinka ir aplinką tausojančio elgesio iki šiol dažniausiai buvo tyrinėtas VIITD šalyse suaugusiųjų populiacijoje. Siekiant užpildyti šią spragą ištirta, ar susirūpinimas aplinka gali paaiškinti aplinką tausojantį elgesį Lietuvoje (3 skyrius) ir konkrečiai paauglių populiacijoje (4 ir 5 skyriai). Taip pat tirta, kaip gerai susirūpinimas aplinka paaiškina paauglių aplinką tausojantį elgesį, palyginus su elgesiui specifiškais veiksniais, kurie gali būti svarbūs paaugliams (5 skyrius). Galiausiai ieškota įžvalgų, kaip formuojasi susirūpinimas aplinka. Šeimos kontekstas potencialiai gali būti svarbus asmenų susirūpinimui aplinka ugdyti, todėl tirta, ar tėvų ir jų paauglių vaikų susirūpinimas aplinka yra susijęs (6 skyrius).

# Antras skyrius: bendroji diskusija

## 2.1 Įvadas

Siekiant įveikti pasaulinę klimato krizę svarbu, kad kuo daugiau žmonių skirtinguose kontekstuose tausotų aplinką. Susirūpinimo aplinka elementai, biosferinės vertybės ir aplinkosauginis tapatumas gali paskatinti žmones tausoti aplinką. Aplinkosauginis tapatumas kyla iš biosferinių vertybių ir gali būti sustiprintas intervencijomis, primenant žmonėms apie jų aplinką tausojantį elgesį praeityje. Aplinkosauginis tapatumas turi teorinių sąsajų su kitais konstruktais, reprezentuojančiais žmogaus ir aplinkos santykį, tokiais kaip ryšys su gamta ir aplinkos tapatumas. Todėl svarbu ištirti, kuo aplinkosauginis tapatumas yra unikalus, padedant suprasti žmonių aplinką tausojantį elgesį ir jį stiprinti. Tad tirtos konceptualios ir empirinės aplinkosauginio tapatumo skirtybės kitų ryšį su aplinka nusakančių konstruktų kontekste. Tai buvo pirmasis tokio pobūdžio tyrimas, kurio metu minėti ryšiai patikrinti metaanalitiškai. Susirūpinimas aplinka gali paskatinti įvairią aplinką tausojančią elgseną be išorinio paskatinimo ar sankcijų. Tačiau kyla klausimas, ar susirūpinimas aplinka lemia skirtingų žmonių aplinką tausojantį elgesį skirtinguose kontekstuose? Žmonės gali turėti kitų prioritetų nei aplinkos tausojimas, o tai gali trukdyti susirūpinimui aplinka virsti aplinką tausojančia elgsena. Žmonių elgesį gali lemti kiti veiksniai, pavyzdžiui, ekonominiai (pvz., aplinką tausojančio elgesio trūkumai ir privalumai). Šioje disertacijoje remiamasi ankstesniais tyrimais, be to, jie praplečiami tiriant susirūpinimo aplinka vaidmenį, paaiškinant skirtingų žmonių įvairią aplinką tausojančią elgseną mažiau ištirtuose kontekstuose, kur kiti veiksniai gali turėti įtakos aplinkai palankiam elgesiui formuotis. Pirma tiriami žmonių susirūpinimo aplinka ir įvairios aplinką tausojančios elgsenos ryšiai Lietuvoje, kovojančioje su aktualiomis socialinėmis, demografinėmis ir ekonominėmis problemomis. Toliau tiriama, ar susirūpinimas aplinka paaiškina aplinką tausojantį paauglių elgesį. Paauglių aplinką tausojančiam elgesiui gali turėti įtakos tokie veiksniai kaip asmeninės ir socialinės normos, suvoktos aplinkosauginės problemos ir poreikis jas spręsti, įpročiai, suvokiama elgesio kontrolė ir elgesio prieinamumas. Be to, šeima gali būti svarbi plėtojant žmonių susirūpinimą aplinka. Tėvai ir jų paaugliai vaikai gali turėti įtakos vieni kitų susirūpinimui aplinka. Pirmasis žingsnis nagrinėjant šiuos ryšius yra išsiaiškinti,

ar tėvų ir jų paauglių vaikų susirūpinimas aplinka yra susiję, todėl šis klausimas nagrinėtas šioje disertacijoje.

### 2.1.1 Aplinkosauginio tapatumo ir kitų žmogaus bei aplinkos ryšius reprezentuojančių konstruktų skirtybės

Aplinkosauginis tapatumas yra unikali jungtis tarp biosferinių vertybių ir aplinką tausojančio elgesio, nes jis yra lankstus ir gali būti stiprinamas primenant žmonėms apie jų praeityje buvusį aplinką tausojantį elgesį (van der Werff ir kt., 2014a). Sustiprėjęs aplinkosauginis tapatumas skatina aplinką tausojantį elgesį ir išplinta į kitą elgesį (van der Werff ir kt., 2014b). Yra ir kitų konstruktų, atspindinčių žmogaus ir aplinkos ryšį. Šie konstruktai yra ryšys su gamta (Schultz, 2002) ir aplinkos tapatumas (Clayton, 2003). Tačiau neaišku, kuo šie konstruktai skiriasi ir kuo jie yra panašūs. Aplinkosauginio tapatumo svarba biosferinių vertybių ir aplinką tausojančio elgesio ryšiui paskatino ištirti jo konceptualias ir empirines skirtybes nuo kitų konstruktų, atspindinčių žmonių ir aplinkos ryšius.

Sisteminės literatūros apžvalgos ir analizės rezultatai (antras skyrius) atskleidė, kad ryšys su gamta, aplinkosauginis tapatumas ir aplinkos tapatumas parodo, kaip žmonės mato savo ryšį su aplinka. Analizė taip pat rodo, kad aplinkosauginis tapatumas yra atskiras teorinis konstruktas nuo kitų dviejų konstruktų. Aplinkosaugins tapatumas parodo, kiek žmogus mano esantis draugiškas aplinkai ir ar laiko save aplinką tausojančiu asmeniu (van der Werff ir kt., 2013b). Ryšys su gamta parodo, kiek žmogus suvokia save kaip gamtos dalį (Schultz, 2002), o aplinkos tapatumas – kiek žmogus jaučiasi susijęs su tam tikromis natūralios aplinkos dalimis (Clayton, 2003). Šių konstruktų apibrėžimo skirtumai atspindi ir skirtingą motyvaciją elgtis aplinką tausojančių būdu. Žmonės gali tausoti aplinką esant šioms sąlygoms: dėl to, kad mato save susietą su natūralia aplinka ar jos dalimis (Nisbet ir kt., 2009); nes žmonės yra įsitikinę, kad jie yra draugiški aplinkai, nepaisant to, ar jie laiko save gamtos dalimi, ar ne. Tai gali reikšti, kad aplinkosauginis tapatumas lems daugiau ir platesnį spektrą aplinką tausojančių elgesių nei ryšys su gamta ar aplinkos tapatumas. Neseniai atlikta metaanalizė apie ryšį tarp konstruktų, atspindinčių žmogaus ir aplinkos sąsajas su ketinimais tausoti aplinką ir elgesiu, iš tiesų parodė, kad aplinkosauginis tapatumas buvo šiek tiek stipriau susijęs su ketinimais tausoti aplinką ir elgesiu nei ryšys su gamta (Vesely ir kt., 2021). Dėl aukščiau minėtų priežasčių ir dėl to, kad aplinkosauginis tapatumas gali būti stipresnis daugelio

aplinką tausojančių elgsenų prognostinis veiksnys, galima teigti, kad aplinkosauginis tapatumas skiriasi nuo panašių konstruktų ir yra svarbiausias norint suprasti ir stiprinti žmonių aplinką tausojančią elgseną. Metaanalizės rezultatai atskleidė stiprų ryšį tarp ryšio su gamta ir aplinkos tapatumo įverčių ir ne tokį stiprų, nors vis dar santykinai stiprų, tarp ryšio su gamta ir aplinkosauginio tapatumo įverčių (antras skyrius). Viena vertus, stiprios sąsajos tarp ryšio su gamta ir aplinkosauginio tapatumo gali reikšti jų panašumą. Santykinai stiprus ryšys tarp dviejų konstruktų gali būti todėl, kad jie abu rodo, kaip žmonės mato savo santykį su aplinka (Schultz, 2002). Aplinkos tapatumą ir ryšį su gamta sieja tai, kad žmonės, turintys stiprų aplinkosauginį tapatumą ir stiprų ryšį su gamta, rūpinasi gamta ir aplinka. Aplinkosauginis tapatumas yra įsišaknijęs biosferinėse vertybėse – kuo labiau žmonėms rūpi gamta ir aplinka, tuo labiau jie save laiko draugiškais aplinkai (van der Werff ir kt., 2014b). Panašiai žmonės, kurie mato save kaip gamtos dalį, tikėtina, siekia rūpintis gamta ir nori ją saugoti (Schultz, 2002). Pirminiai įrodymai patvirtina, kad ryšys su gamta yra glaudžiai susijęs su biosferinėmis vertybėmis (Martin ir Czellar, 2017). Tačiau, antra vertus, nors aplinkosauginis tapatumas ir ryšys su gamta yra glaudžiai tarpusavyje susiję ir turi tam tikrą bendrą teorinį pagrindą, jie teoriškai skiriasi vienas nuo kito. Kaip jau minėta aukščiau, taip yra dėl skirtingų motyvų, skatinančių aplinką tausojantį elgesį. Žmonės, kurie elgiasi aplinką tausojančiu būdu, nes mato save kaip draugiškus aplinkai žmones (stiprus aplinkosauginis tapatumas), nebūtinai jaus ryšį su gamta ar jos dalimis. Dėl to aplinkosauginis tapatumas yra svarbiausias konstruktas, galintis padėti suprasti ir stiprinti aplinką tausojantį elgesį. Be to, antro skyriaus rezultatai rodo, kad ryšio su gamta ir aplinkosauginio tapatumo sąsajos yra silpnesnės nei tarp ryšio su gamta ir aplinkos tapatumo. Tai potencialiai gali rodyti tam tikrą empirinį skirtumą tarp ryšio su gamta ir aplinkosauginio tapatumo.

Daroma išvada, kad ryšys su gamta ir aplinkosauginis tapatumas turi tam tikrų panašumų (t. y. yra glaudžiai susiję), bet ir skiriasi (t. y. silpnesnės sąsajos tarp ryšio su gamta ir aplinkosauginio tapatumo nei aplinkos tapatumo). Remiantis sistemine literatūros apžvalga, teigiama, kad aplinkosauginis tapatumas yra atskiras konstruktas nuo ryšio su gamta ir aplinkos tapatumo. Nors konstruktai turi bendras teorines šaknis, ryšys su gamta, aplinkosauginis tapatumas ir aplinkos tapatumas turi skirtingas motyvacijas elgtis aplinką tausojančiu būdu.

### 2.1.2 Susirūpinimo aplinka ir aplinką tausojančio elgesio sąsajos Lietuvos suaugusiųjų ir paauglių imtyje

Pagrindinis šioje disertacijoje keliamas klausimas – ar susirūpinimas aplinka, išreikštas per biosferines vertybes ir aplinkosauginį tapatumą, gali paaiškinti skirtingų žmonių aplinką tausojančias elgsenas skirtinguose kontekstuose. Tyrimai VIITD šalyse suaugusiųjų populiacijoje parodė, kad susirūpinimas aplinka paaiškina daugybę aplinką tausojančių elgsenų. Pradiniai rezultatai iš ne VIITD šalių rodo, kad atskiri susirūpinimo aplinka aspektai, biosferinės vertybės paaiškina įvairią suaugusiųjų aplinką tausojančią elgseną. Tačiau šie tyrimai nepateikia duomenų apie tai, ar biosferinės vertybės paaiškina aplinką tausojantį elgesį per aplinkosauginį asmens tapatumą. Aplinkosauginis tapatumas yra esminė grandis, jungianti biosferines vertybes ir aplinką tausojantį elgesį; jis taip pat gali būti labai svarbus veiksnys intervencijose, kuriomis siekiama skatinti aplinką tausojantį elgesį (žr. 1.1.1 skyrių). Šis klausimas aktualus ir skirtingoms amžiaus grupėms, tad kyla klausimas, kiek susirūpinimas aplinka gali paaiškinti žmonių aplinką tausojantį elgesį kitose amžiaus grupėse, pavyzdžiui, paauglių.

Trečiame, ketvirtame, penktame ir šeštame skyriuose pateikiami įrodymai, kad susirūpinimas aplinka gali paaiškinti įvairią skirtingų žmonių aplinką tausojančią elgseną skirtinguose kontekstuose. Pirma, šis klausimas nagrinėtas ne VIITD šalyje, t. y. Lietuvoje, kuri, be aplinkosaugos problemų, susiduria su kitomis socialinėmis, demografinėmis ir ekonominėmis problemomis, tokiomis kaip socialinė nelygybė, gyventojų mažėjimas kaimo vietovėse ir ekonominiai sunkumai. Kai žmonės teikia pirmenybę šiems klausimams, gali sumažėti susirūpinimo aplinka poveikis jų aplinką tausojančiai elgsenai. Tačiau tyrimo metu nustatyta, kad biosferinės vertybės ir aplinkosauginis tapatumas paaiškina suaugusiųjų aplinką tausojantį elgesį Lietuvoje. Trečiame skyriuje nustatyta, kad susirūpinimas aplinka buvo susijęs su rūšiavimu ir aplinkosauginiu aktyvizmu Lietuvoje suaugusiųjų imtyje. Šeštame skyriuje nustatyta, kad susirūpinimas aplinka buvo susijęs su daugybe aplinką tausojančių elgsenų, pvz., ekologiškų maisto produktų pirkimu, savo krepšio naudojimu apsiperkant ir plastiko rūšiavimu. Šį ryšį medijavo elgesiui specifiškos asmeninės normos. Rezultatai atitinka ankstesnių tyrimų rezultatus, rodančius, kad biosferinės vertybės ir aplinkosauginis tapatumas gali paaiškinti daugybę aplinką tausojančių elgsenų per asmenines normas (van der Werff ir kt., 2013b, 2014b), ir teikia

pirmuosius įrodymus, kad šie ryšiai nustatomi ir šalyse už Vakarų Europos ir JAV ribų. Šios disertacijos tyrimo išvados išplečia esamus įrodymus iš ne VIITD šalių ir parodo, kad susirūpinimas aplinka paaiškina daugybę aplinką tausojančių elgsenų suaugusiųjų imtyje. Ankstesni tyrimai, atlikti ne VIITD šalyse, buvo skirti išsiaiškinti, kiek biosferinės vertybės paaiškina aplinką tausojantį elgesį, tačiau juose nebuvo įtrauktas aplinkosauginis tapatumas. Turint mintyje, kad aplinkosauginis tapatumas medijuoja ryšį tarp biosferinių vertybių ir daugybės aplinką tausojančių elgsenų ir gali būti stiprinamas intervencijose, buvo svarbu parodyti, kad šiuos rezultatus galima apibendrinti ne tik VIITD šalims.

Tačiau biosferinės vertybės ir aplinkosauginis tapatumas nebuvo susiję su ekonomišku vairavimu ir aplinką tausojančio transporto naudojimu (trečias skyrius). Gali būti bent dvi priežastys, kodėl susirūpinimas aplinka nėra susijęs su tokiu elgesiu Lietuvoje. Pirma, dėl kontekstinių veiksnių Lietuvos gyventojams gali būti per brangu ir (arba) reikalautų per daug pastangų taip elgtis, todėl tai gali trukdyti žmonėms elgtis remiantis savo susirūpinimu aplinka. Lietuvos viešojo transporto ir dviračių infrastruktūra yra nepakankamai išvystyta: dviračių takai didesniuose miestuose yra įrengti nenuosekliai, o kaimo vietovėse jų beveik nėra, todėl keliauti į darbą ir atgal dviračiu yra paprasčiausiai nepatogu, o kartais net ir nesaugu. Panašiai galima vertinti viešąjį transportą, pvz., autobusai, net ir kursuojantys reikiamu dažniu, gali atstumti žmones dėl nepakankamo šildymo, vėsinimo ar švaros. Ankstesni tyrimai rodo, kad susirūpinimas aplinka iš tiesų gali santykinai silpniau paaiškinti aplinką tausojančią elgseną, reikalaujančią didesnių pastangų (Gatersleben ir kt., 2014; Whitmarsh ir O'Neill, 2010). Tikėtina, kad net ir tie žmonės, kurie yra stipriai susirūpinę aplinka, nesinaudos aplinkai draugišku transportu, jei jis reikalauja per didelių asmeninių pastangų. Antra, žmonės, stipriai susirūpinę aplinka, gali nesielgti aplinką tausojančiai, jei nemanys, kad jų elgesys kenkia aplinkai. Pavyzdžiui, žmonės gali nežinoti, kad įvaldę degalus taupantį vairavimo stilių (pvz., išjungę automobilio variklį prie šviesoforo), jie gali tausoti aplinką. Aplinką tausojantis vairavimas Lietuvoje skatinamas akcentuojant ekonominius motyvus (sutaupoma degalų ir pinigų). Esant tokiai situacijai, žmonės gali nesusieti savo elgesio su susirūpinimu aplinka. Arba žmonės gali suvokti, kad dėl vairavimo stiliaus kyla aplinkosaugos problemų, tačiau jiems trūksta žinių ir įgūdžių, kaip taupyti degalus vairuojant. Tai gali būti ypač aktualu Lietuvos vairuotojams, įgijusiems vairuotojo pažymėjimą dar prieš tai, kai

vairavimo mokyklose buvo pradėtas akcentuoti ekonomiško vairavimo stilius, arba naujiems vairuotojams, kurie dar nėra įvaldę vairavimo įgūdžių. Tačiau kai kurios Lietuvos gyventojų grupės gali žinoti apie neefektyvaus vairavimo aplinkai pasekmes ir žinoti, kaip vairuoti, kad sutaupytų degalų, bet vis tiek to nedaryti. Taip gali būti todėl, kad tokių žmonių vairavimo elgesį motyvuoja visai ne susirūpinimas aplinka. Pavyzdžiui, viršydami greitį kai kurie žmonės Lietuvoje neva demonstruoja savo šaunumą. Toks elgesys demonstruojamas referentinei grupei, kuri greičio viršijimą ir pavojingą vairavimą laiko tam tikra norma (socialinės normos). Taip pat gali būti atvejų, kai susirūpinimas aplinka paaiškina elgesį tiesiogiai. Pavyzdžiui, vegetariško maisto valgymas buvo tiesiogiai susijęs su aplinkosauginiu asmens tapatumu ir asmeninėmis normomis valgyti vegetarišką maistą, bet ne per biosferinių vertybių, aplinkosauginio tapatumo ir asmeninių normų grandinę (šeštas skyrius). Apibendrinus galima teigti, kad susirūpinimas aplinka menkiau paaiškina kai kurį aplinką tausojantį elgesį. Be to, kai kurie susirūpinimo aplinka komponentai gali tiesiogiai paaiškinti elgesį. Taip gali būti dėl to, kad kitiems kontekstiniams ir su elgesiu susijusiems veiksniams tenka svarbus vaidmuo, kuris neleidžia žmonėms veikti pagal savo susirūpinimą aplinka.

Vis tik kyla klausimas, ar susirūpinimas aplinka gali vienodai paaiškinti skirtingų amžiaus grupių, pavyzdžiui, paauglių, aplinką tausojantį elgesį? Dėl paauglystės vystymosi ypatumų susirūpinimas aplinka gali būti ne pagrindinis veiksnys, paaiškinantis jų aplinką tausojantį elgesį. Gali būti svarbūs ir kiti veiksniai, tokie kaip socialinės normos, kurios gali būti ypač svarbios paauglystėje dėl padidėjusio jautrumo bendraamžių įtakai (Albert ir kt., 2013), ir suvokiama elgesio kontrolė, kurios paaugliai kai kuriam elgesiui (pvz., vartojimo elgesiui) gali turėti mažiau nei suaugusieji. Todėl ieškota atsakymo į klausimą, ar susirūpinimas aplinka yra susiję su įvairiu paauglių aplinką tausojančiu elgesiu. Buvo atlikti penki tyrimai paauglių imtyje (ketvirtas, penktas ir šeštas skyriai).

Visuose tyrimuose nustatyta, kad paauglių susirūpinimas aplinka buvo nuosekliai susijęs su įvairiu aplinką tausojančiu elgesiu Lietuvoje, pavyzdžiui, rūšiavimu ir važiavimu dviračiu į mokyklą (ketvirtas skyrius), pakartotiniu maišelio panaudojimu apsiperkant ir nenaudojamų daiktų dovanojimu ar pardavimu (penktas skyrius), vegetariška mityba bei plastikinių butelių atnešimu į taromatą (šeštas skyrius). Nustatyta, kad biosferinės vertybės ir aplinkosauginis tapatumas buvo susiję su paauglių asmeninėmis normomis

elgtis aplinką tausojančiu būdu, o jos savo ruožtu buvo susijusios su atitinkamu aplinką tausojančiu elgesiu. Šie radiniai prisideda prie įrodymų, kad biosferinės vertybės, aplinkosauginis tapatumas ir asmeninės normos elgtis aplinką tausojančiu būdu yra universalūs veiksniai, galintys paaiškinti aplinką tausojantį elgesį net ir ne suaugusiųjų imtyse. Tyrimai paauglių imtyje taip pat parodė, kad susirūpinimas aplinka paaiškina įvairų aplinką tausojantį paauglių elgesį – nuo bendro (pvz., perkami aplinkai draugiški produktai) iki specifinio (pvz., perkami ekologiški maisto produktai) ir iki labai specifinio (pvz., geriamas vanduo iš čiaupo, užuot pirkus vandenį buteliuose). Toliau nustatyta, kad klausiant apie aplinką tausojantį elgesį abstrakčiau, pvz., apie rūšiavimą bendrai, toks elgesys buvo stipriau susijęs su susirūpinimu aplinka (ketvirtas skyrius, pirmas tyrimas), palyginti su atvejais, kai buvo klausiama apie konkretesnį elgesį, pvz., plastiko, kurio negalima grąžinti į taromatą, rūšiavimu (ketvirtas skyrius, antras tyrimas) arba vandens iš krano gėrimu (ketvirtas skyrius, trečias tyrimas). Viena vertus, konstruktai gali būti stipriai susiję, jei yra matuojami tuo pačiu abstraktumo (bendrumo ar specifiškumo) lygiu (suderinamumo principas; Ajzen, 1996). Antra vertus, tai nepaaiškina, kodėl kai kuriais atvejais abstraktesni konstruktai buvo stipriai susiję su specifiškais konstruktais. Pavyzdžiui, ryšys tarp biosferinių vertybių ir asmeninių normų gerti vandenį iš čiaupo (ketvirtas skyrius, pirmas tyrimas), ryšys tarp aplinkosauginio tapatumo ir vegetariškos mitybos (šeštas skyrius) (dar žr. Ruepert ir kt., 2016). Todėl galima teigti, kad susirūpinimas aplinka lemia bendrą polinkį tausoti aplinką (Rim ir kt., 2013; Trope ir Liberman, 2012), tačiau kiti veiksniai taip pat gali turėti įtakos.

Vis tik, kaip ir suaugusiųjų atveju, ne kiekvienas paauglių aplinką tausojantis elgesys buvo susijęs su susirūpinimu aplinka. Biosferinės vertybės, aplinkosauginis tapatumas ir asmeninės normos elgtis aplinką tausojančiu būdu nepaaiškino vandens buteliuose vartojimo (penktas skyrius) ir supakuotų prekių pirkimo (šeštas skyrius). Pirmuoju atveju biosferinės vertybės buvo susijusios su asmeninėmis normomis nepirkti vandens buteliuose ir aplinkosauginiu tapatumu. Biosferinės vertybės buvo susijusios su kiekvienu aukščiau aptartu kintamuoju atskirai, bet ne per aplinkosauginį tapatumą. Be to, nė vienas iš susirūpinimo aplinka elementų nevirto aplinką tausojančiu elgesiu. Gali būti, kad kai kurios paauglių asmeninės normos elgtis aplinką tausojančiu būdu kyla iš biosferinių vertybių, bet ne iš aplinkosauginio tapatumo. Tačiau biosferinės vertybės ir asmeninės normos elgtis aplinką tausojančiu būdu nevirto elgesiu, nes

šių konstruktų ryšiui reikšmės galėjo turėti ir kiti veiksniai, pavyzdžiui, socialinės normos. Paaugliai išties gali turėti tvirtas biosferines vertybes ir tvirtą moralinį įsipareigojimą nevartoti vandens buteliuose, tačiau, jei jie mano, kad tarp jų bendraamžių gerti vandenį iš čiaupo nėra šaunu, paauglių susirūpinimas aplinka nevirs elgesiu. Antruoju atveju biosferinės vertybės buvo susijusios su asmeninėmis normomis pirkti nesupakuotas prekes dėl aplinkosauginio tapatumo, tačiau šis ryšys neperaugo į elgesį. Vienas iš galimų veiksnių, galinčių tam virsmui trukdyti, yra pirkimo įgūdžių trūkumas, kuris paauglystėje dar gali būti neišugdytas. Pavyzdžiui, norint nusipirkti nesupakuotą maisto produktą priešpiečiams, gali prireikti specifinių žinių ir praktikos, kurių dar ne visi paaugliai turi. Tai vėl rodo, kad gali egzistuoti kiti paauglių aplinką tausojantį elgesį paaiškinantys veiksniai, kurie gali paaiškinti, kodėl tam tikrais atvejais susirūpinimas aplinka neperauga į aplinką tausojantį elgesį. Todėl toliau buvo tirta, kaip gerai susirūpinimas aplinka paaiškina paauglių aplinką tausojantį elgesį, palyginti su kitais potencialiai svarbiais veiksniais.

Buvo palyginti du teoriniai modeliai, iš kurių vienas – *Vertybių, tapatumo ir asmeninių normų modelis* (VTA) (angl. *the Values-Identity-Personal norms model* – VIP; van der Werff & Steg, 2016), akcentuojantis bendrąjį susirūpinimą aplinka, o kitas – *Išsamus elgesio determinacijos modelis* (IEDM) (angl. *Comprehensive Action Determination Model* – CADM; Klöckner & Blöbaum, 2010), akcentuojantis elgesiui specifiškus veiksnius. IEDM modelis postuluoja, kad asmeninės normos elgtis aplinką tausojančiu būdu bus stipresnės, jei žmonės: suvoks, kad kiti tikisi tokio jų elgesio (socialinės normos), suvoks poreikį spręsti aplinkos problemas (suvoktas poreikis), suvoks savo elgesio pasekmes aplinkai (suvoktos pasekmės) ir manys, kad jie gali kontroliuoti tam tikrą aplinką tausojantį elgesį (suvokta elgesio kontrolė). IEDM aptariami ir situaciniai veiksniai, galintys skatinti arba slopinti paauglių aplinką tausojantį elgesį. Jei paaugliai mano, kad jie gali kontroliuoti savo aplinką tausojantį elgesį (suvokta elgesio kontrolė) ir turi realią prieigą prie elgesio (elgesio prieinamumas), tai gali lemti paauglių įsitraukimą į elgesį. Siekta išsiaiškinti, kaip gerai abu modeliai, VTA ir IEDM, paaiškina paauglių ketinimus elgtis aplinką tausojančiu būdu ir elgseną. IEDM modelyje postuluojama, kad aplinką tausojantis elgesys vyksta nesąmoningai – iš įpročio. Įpročio tausoti aplinką stiprumas gali skirtis, priklausomai nuo elgesio. Todėl buvo tikrinta, kiek įpročiai gali paaiškinti daugybę aplinką tausojančių elgsenų.

Dviejų tyrimų paauglių imtyje rezultatai atskleidė, kad su nežymiais svyravimais, susirūpinimas aplinka, aplinką tausojantį elgesį paaiškino labai panašiai kaip ir elgesiui specifiški veiksniai (penktas skyrius). Susirūpinimas aplinka ir elgesiui specifiški veiksniai paaiškino tris iš keturių tirtų ketinimų ir elgsenų: vandens buteliuose pirkimą (pirmas tyrimas), savo krepšio naudojimą apsiperkant ir nenaudojamų daiktų dovanojimą ar pardavimą (antras tyrimas). Tiek susirūpinimas aplinka, tiek ir elgesiui specifiški veiksniai menkai paaiškino supakuotų prekių pirkimą. Įdomu tai, kad ir susirūpinimas aplinka, ir elgesiui specifiški veiksniai iš esmės gerai paaiškino ketinimą pirkti nesupakuotas prekes. Tikėtina, kad tam tikri veiksniai arba priežastys, nenumatyti šiame tyrime, trukdė ketinimams virsti elgesiu. Įdomu ir tai, kad įpročiai buvo visiškai nesusiję su elgesiu pirkti nesupakuotas prekes. Taip galėjo nutikti dėl to, kad tik 25,6 proc. paauglių nurodė turį stiprų įprotį pirkti nesupakuotas prekes, o tai rodo, kad dauguma dalyvių arba išvis neturėjo tokio įpročio arba įprotis buvo silpnas, todėl tikėtina ir neperaugo į elgesį. Be to, šio elgesio prieinamumas nebuvo susijęs su elgesiu, nors 77,9 proc. paauglių teigė, kad jie turi pakankamą arba labai gerą prieigą prie tokių pirkinių, o tai rodo, kad tik nedidelė dalis dalyvių neturėjo galimybės pirkti nesupakuotų prekių. Be to, 65,1 proc. dalyvių teigė, kad nuo jų priklauso, ar pirks nesupakuotas prekes, ar ne (stipri suvokiama elgesio kontrolė). Šie rezultatai rodo, kad pasireiškiant kai kuriai elgsenai, pvz., nesupakuotų prekių pirkimo atveju, net jei paaugliai jaučia stiprų susirūpinimą aplinka, turi galimybę elgtis tam tikru būdu ir jaučiasi atsakingi už savo elgesį, silpnas įprotis gali trukdyti susirūpinimui aplinka ir kitiems veiksniams virsti elgesiu. Socialinės normos gali būti dar vienas veiksnys, svarbus užkertant kelią ketinimams virsti elgesiu. IEDM postuluoja, kad socialinės normos elgtis aplinką tausojančiu būdu yra susijusios su elgesiu per ketinimus. Įdomu tai, kad šiame tyrime tik 30,9 proc. paauglių nurodė, kad jų artimieji tikėtųsi, kad jie pirks nesupakuotas prekes, o 30,3 proc. ketina tai padaryti. Šie rezultatai rodo, kad dauguma šiame tyrime dalyvavusių paauglių nejaučia savo artimųjų spaudimo pirkti nesupakuotas prekes ir greičiausiai dėl šios priežasties nejaučia didelio noro to daryti.

Apibendrinus atliktų tyrimų rezultatus, šios išvados išplečia ankstesnių tyrimų duomenis ir pateikia pirmuosius įrodymus, kad susirūpinimo aplinka komponentai, biosferinės vertybės ir aplinkosauginis tapatumas, kurie yra bendri konstruktai ir gana nutolę nuo elgesio, paaiškina paauglių elgesį panašiai gerai

kaip ir elgesiui specifiški veiksniai. Tokie rezultatai papildo šioje disertacijoje surinktus įrodymus, leidžiančius teigti, kad susirūpinimas aplinka iš tiesų yra universalus veiksnys, galintis paaiškinti skirtingų žmonių (t. y. paauglių) įvairų aplinką tausojantį elgesį skirtinguose kontekstuose (t. y. Lietuvoje).

### 2.1.3 Ryšys tarp tėvų ir jų vaikų susirūpinimo aplinka

Vienas iš galimų kanalų, kur galėtų formuotis susirūpinimas aplinka, yra šeima. Šeima yra svarbi struktūra, kurioje atsiranda ir formuojasi įvairios asmeninės psichologinės savybės, todėl tikėtina, kad šeimoje formuojasi ir susirūpinimas aplinka (Manfredo ir kt., 2017; Olkinuora, 1972; Schwartz, 1977). Šeimos nariai gali veikti vieni kitų susirūpinimą aplinka. Tėvai gali paveikti savo vaikų susirūpinimą aplinka, o vaikai – tėvų (Boudet ir kt., 2016; Grønhøj ir Thøgersen, 2017). Tai reikštų, kad šeimos narių susirūpinimas aplinka yra teigiamai susijęs. Tačiau kyla klausimas, ar taip iš tikrųjų yra, nes paaugliai ir jų tėvai paprastai yra veikiami skirtingos aplinkos (Knafo-Noam ir kt., 2020; Kuczynski ir Parkin, 2007). Be to, dėl su amžiumi susijusių ypatumų paaugliai bando atsiskirti nuo savo tėvų, tyrinėdami naujus vaidmenis visuomenėje ir siekdami savarankiškumo nuo tėvų (Becht ir kt., 2016; Boykin McElhaney ir Allen, 2001; Pfeifer ir Berkman, 2018). Taigi tėvus ir jų paauglius vaikus gali paveikti skirtingų grupių socialinės normos. Tai reikštų, kad tėvų ir jų paauglių vaikų susirūpinimas aplinka nėra susijęs arba susijęs neigiamai. Sąsajų tarp tėvų ir jų paauglių vaikų susirūpinimo aplinka nustatymas būtų svarbus įrodymas, kad susirūpinimas aplinka gali potencialiai kilti šeimoje.

Ištyrus šiuos ryšius reprezentatyvioje paauglių ir jų tėvų imtyje (šeštas skyrius) pateikiami pirmieji įrodymai, kad jų susirūpinimas aplinka yra stipriai susijęs. Tai gali reikšti, kad susirūpinimas aplinka formuojasi šeimos kontekste. Tačiau, atsižvelgiant į tai, kad nebuvo užfiksuoti priežastiniai procesai ir netirta, kaip tėvai ir jų paaugliai vaikai daro įtaką vieni kitų susirūpinimui aplinka, reikia tyrimų ateityje, leisiančių stebėti susirūpinimo aplinka formavimosi procesus šeimos kontekste. Gauti rezultatai patvirtina ankstesnių tyrimų duomenis, kuriuose teigiama, kad tėvai ir jų paaugliai turi panašias vertybes, tapatumą ir normas (Doring ir kt., 2017; Friedlmeier ir Trommsdorff, 2011; Gibbs, 2013; Gotschi ir kt., 2009; Hardy ir kt., 2008). Kandler ir kt., 2016; Schachter ir Ventura, 2008; Schinkel ir de Ruyter, 2017), tačiau mūsų tyrime šis ryšys atsiskleidžia naujoje, aplinką tausojančio elgesio, srityje.

Šiuo tyrimu buvo patvirtinta kituose disertacijos skyriuose nustatyti dėsningumai (trečias, ketvirtas ir penktas skyriai), t. y. kad biosferinės vertybės ir aplinkosauginis tapatumas per asmenines normas paaiškina ir suaugusiųjų, ir paauglių aplinką tausojantį elgesį. Šiame tyrime patvirtinti kitų autorių tyrimuose gauti rezultatai. Nustatyta, kad tėvų ir jų paauglių vaikų aplinką tausojantis elgesys yra stipriai susijęs (Grønhøj & Thøgersen, 2009, 2012; Katz-Gerro, Greenspan, Handy ir Vered , 2019; Wallis & Klöckner, 2018). Svarbu akcentuoti, kad mūsų tyrimo duomenys rodo, kad šios sąsajos galimos ir ne VIITD šalyje.

Apibendrinus gautus rezultatus, šis tyrimas rodo, kad tėvų ir jų paauglių vaikų biosferinės vertybės, aplinkosauginis tapatumas ir asmeninės normos yra stipriai susiję. Ateities tyrimai galėtų paaiškinti, kaip susirūpinimas aplinka vystosi įvairiose amžiaus grupėse.

### 2.1.4 Ribotumai ir ateities tyrimų kryptys

Siekiant ištirti ryšį tarp susirūpinimo aplinka ir aplinką tausojančio elgesio buvo pasitelktas koreliacinis dizainas. Gauti rezultatai yra svarbūs, nes suteikia pirminius įrodymus, kad susirūpinimas aplinka ir asmeninės normos elgtis aplinką tausojančiu būdu gali paaiškinti daugybę aplinką tausojančių elgsenų naujame kontekste – ne VIITD šalyje ir iki šiol netyrinėtose imtyse – tarp paauglių (trečias, ketvirtas, penktas ir šeštas skyriai). Tačiau koreliacinis tyrimo dizainas neleidžia daryti išvadų apie priežastinius ryšius. Egzistuoja keli būdai, kaip būsimi tyrimai galėtų išspręsti šį ribotumą.

Ateities tyrimai galėtų eksperimentiškai manipuliuoti vienu iš susirūpinimo aplinka komponentų, pavyzdžiui, aplinkosauginiu tapatumu, ir stebėti, ar ir kaip aplinkosauginio tapatumo pokyčiai veikia biosferines vertybes, asmenines normas ir aplinką tausojantį elgesį. Ankstesni tyrimai parodė, kad eksperimentiškai manipuliuojant aplinkosauginio tapatumo lygiais primenant žmonėms apie jų aplinką tausojantį elgesį praeityje, buvo sustiprintas aplinkosauginis tapatumas ir paveiktas žmonių aplinkai draugiškų produktų pasirinkimus; be to, šis efektas išplito į kitą aplinką tausojantį elgesį (van der Werff ir kt., 2014b; van der Werff ir Steg, 2018), o tai rodo priežastinį ryšį. Šiuose tyrimuose nebuvo nagrinėjama, kaip manipuliacija galėjo paveikti biosferines vertybes ir asmenines normas. Panašiai galima manipuliuoti asmeninėmis normomis ir stebėti, kaip jų stiprumas moderuoja manipuliacijos efektyvumą. Ankstesni tyrimai parodė, kad asmeninių normų stiprumas moderavo inter-

vencijos, kuria buvo siekiama sustiprinti ketinimus mažinti maisto švaistymą ir mėsos vartojimą, efektą (de Groot ir kt., 2021). Ši studija, deja, nenagrinėjo, kaip manipuliavimas asmeninėmis normomis galėjo turėti įtakos biosferinėms vertybėms ir aplinkosauginiam tapatumui. Žmonės, kurių asmeninės normos elgtis aplinką tausojančiu būdu buvo stipresnės, buvo mažiau paveikti manipuliacijos, palyginus su žmonėmis, kurių asmeninės normos buvo silpnos; o tai vėl rodo priežastinį ryšį tarp asmeninių normų stiprumo ir ketinimų elgtis aplinką tausojančiu būdu. Ateities tyrimai galėtų nagrinėti, kaip paveikus vieną iš kintamųjų grandinėje (t. y. biosferines vertybes, aplinkosauginį tapatumą, asmenines normas ir elgesį) keičiasi kiti kintamieji.

Aukščiau siūlomų kintamųjų priežastinių ryšių analizė galėtų būti išplėsta naudojant tęstinio tyrimo dizainą (Costantini ir Perugini, 2018). Manipuliuojant vienu iš modelio kintamųjų, galima stebėti kitų kintamųjų pokyčius laike (Kaniušonytė ir Truskauskaitė-Kunevičienė, 2021; Truskauskaitė-Kunevičienė ir kt., 2020). Pavyzdžiui, galima manipuliuoti aplinkosauginiu tapatumu ir stebėti, ar ir kaip laike kinta kiti kintamieji (t. y. biosferinės vertybės, asmeninės normos ir aplinką tausojantis elgesys), ir kiek laiko pokyčiai išlieka. Jei atsiranda manipuliacijos „išblėsimo“ efektas (Bailey ir kt., 2020), galima būtų apsvarstyti papildomą manipuliavimą ar manipuliacijas.

Tęstiniai tyrimai plačiai taikomi raidos psichologijoje, siekiant ištirti bendrųjų vertybių, tapatumo ir normų formavimosi procesus įvairiais asmens raidos etapais – nuo ankstyvos vaikystės iki pilnametystės (Klimstra ir kt., 2010; Malti ir kt., 2021; Meeus ir kt., 2010; Milfont ir kt., 2016; Vecchione ir kt., 2019). Be to, toks dizainas leistų stebėti, kaip formuojasi, stiprėja ir keičiasi susirūpinimas aplinka ir aplinką tausojantis elgesys. Nors tęstiniai tyrimai be eksperimentinio manipuliavimo neleidžia daryti išvadų apie priežastingumą, tačiau jie leidžia suprasti susirūpinimo aplinka ir aplinką tausojančio elgesio pokyčio dinamiką. Pavyzdžiui, pakartotinai matuojant susirūpinimą aplinka ir aplinką tausojantį elgesį nuo penktos iki aštuntos klasės, galima būtų stebėti, kaip šiuo laikotarpiu formuojasi ir keičiasi paauglių susirūpinimas aplinka ir aplinką tausojantis elgesys. Tyrimai apie tai, kaip formuojasi požiūris į aplinkosaugos problemas ir aplinką tausojantis elgesys, yra ankstyvoje stadijoje (Collado ir kt., 2013, 2017; Krettenauer, 2017; Krettenauer ir kt., 2019). Biosferinių vertybių, aplinkosauginio tapatumo ir asmeninių normų raida, kiek žinoma, iki šiol tęstiniuose tyrimuose nebuvo tyrinėta, todėl ateities tyrimai galėtų užpildyti šią spragą.

Koreliacinis dizainas buvo naudotas siekiant įvertinti tėvų ir jų paauglių vaikų susirūpinimo aplinka ryšius (šeštas skyrius). Buvo pateikti svarbūs įrodymai, kad tėvų ir jų vaikų susirūpinimas aplinka yra susijęs taip, kaip ir jų aplinką tausojantis elgesys. Šis ryšys buvo identifikuotas net ir atsižvelgiant į tai, kad paaugliai siekia atsiriboti nuo tėvų ir maištauja prieš tėvų vertybes ir normas. Svarbu tai, kad šie koreliaciniai duomenys neleidžia daryti priežastinių išvadų apie šį stiprų ryšį. Nėra žinoma santykių kryptis, ar tėvai daro įtaką savo paaugliams vaikams, ar vaikai daro įtaką savo tėvams, ar santykiai yra dvikrypčiai. Atsižvelgiant į tai, kad visi šie scenarijai yra įmanomi (Knafo-Noam ir kt., 2020; Knafo ir Galansky, 2008), būtų verta toliau tirti šiuos stiprius ryšius, kad būtų galima nustatyti priežastinį ryšį. Remiantis tęstinių tyrimų, matuojančių bendrąsias tėvų ir vaikų vertybes, pavyzdžiu (pvz., Vecchione ir kt., 2019), tėvų ir jų paauglių vaikų susirūpinimas aplinka galėtų būti matuojamas skirtingais laiko momentais ir galėtų būti stebima, kaip ir kokiomis sąlygomis jis formuojasi; ir kokiomis sąlygomis tėvų ir vaikų susirūpinimas aplinka yra susijęs stipriausiai. Nors, kaip minėta aukščiau, tęstinis tyrimas be eksperimentinės manipuliacijos neįrodo priežastingumo, tačiau jis vis tiek gali parodyti, kaip laikui bėgant kinta tėvų ir jų paauglių vaikų susirūpinimas aplinka bei tėvų ir vaikų susirūpinimo aplinka ryšys. Tęstinis tyrimas leidžia stebėti, ar (natūraliai, o ne dėl eksperimentinės manipuliacijos) paauglių aplinkosauginio tapatumo pokyčiai veikia tėvų aplinkosauginį tapatumą, ir atvirkščiai. Eksperimentiniai tyrimai galėtų pateikti svaresnių įrodymų apie priežastinį ryšį ir patikrinti, ar pasikeitus tėvų ar paauglių susirūpinimui aplinka atitinkamai pasikeičia paauglių ar tėvų susirūpinimas aplinka. Tai galima padaryti vadovaujantis intervencinių tyrimų dizainu. Pavyzdžiui, ankstesni tyrimai parodė, kad edukacinės intervencijos, skirtos stiprinti vaikų aplinką tausojantį elgesį, žinias ir motyvaciją, taip pat paveikė atitinkamas jų tėvų savybes (Boudet ir kt., 2016; Damerell ir kt., 2013; Legault ir Pelletier, 2000; Vaughan ir kt., 2003). Panašiai būsimi tyrimai galėtų stiprinti vieną iš paauglių susirūpinimo aplinka aspektų ir stebėti, ar tai turi įtakos jų tėvų susirūpinimo aplinka aspektams.

Intervenciniai ir eksperimentiniai tyrimai galėtų pasiekti du tikslus. Pirma, pateikti įrodymų apie priežastinius ryšius tarp susirūpinimo aplinka ir aplinką tausojančio elgesio. Antra, šie tyrimai galėtų padėti išversti žmonių susirūpinimą aplinka į konkrečias aplinką tausojančias elgsenas. Paaugliai yra ypač svarbi amžiaus grupė, kurios susirūpinimas aplinka galėtų būti sustiprintas

intervencijomis, nes paauglių vertybės, tapatumas ir normos intensyviai vystosi (Manfredo ir kt., 2017; Olkinuora, 1972; Schwartz, 1977; Xie ir kt., 2019). Praktikai galėtų panaudoti šį raidos laikotarpį, kad susietų paauglių susirūpinimą aplinka su jų elgesiu. Tai galima padaryti pasirenkant vieną iš susirūpinimo aplinka komponentų. Kaip minėta aukščiau, priminus žmonėms apie praeityje buvusį aplinką tausojantį elgesį, sustiprėjo jų aplinkosauginis tapatumas ir virto aplinką tausojančiu elgesiu bei išplito į kitą aplinkai palankų elgesį (van der Werff ir kt., 2014a). Panašiai socialinių normų intervencija sustiprino asmenines normas sumažinti maisto švaistymą, bet tik tiems žmonėms, kurių asmeninės normos mažinti maisto švaistymą buvo gana silpnos (de Groot ir kt., 2021). Šios strategijos buvo išbandytos su suaugusiaisiais, todėl būsimi tyrimai galėtų patikrinti, ar jos yra veiksmingos paaugliams. Intervencija, kuri buvo skirta stiprinti paauglių biosferines vertybes edukacinėmis priemonėmis iš tiesų jas pastiprino ir paskatino aplinką tausojantį elgesį (Wijngaarden, 2019). Tačiau šis tyrimas neparodė, kiek laiko truko intervencijos poveikis, todėl būsimi tyrimai galėtų išspręsti šį apribojimą.

Surinkus daugiau įrodymų apie priežastinius ryšius tarp biosferinių vertybių, aplinkosauginio tapatumo, asmeninių normų ir aplinką tausojančio elgesio, būtų galima sustiprinti esamus įrodymus, kad susirūpinimas aplinka yra stiprus ir universalus aplinką tausojančio elgesio prognostinis veiksnys.



Trečiame, ketvirtame, penktame ir šeštame skyriuose tirta, ar susirūpinimas aplinka gali paaiškinti aplinką tausojantį elgesį ne VIITD šalyse. Šių tyrimų rezultatai prisidėjo prie pirminių įrodymų iš tyrimų kitose ne VIITD šalyse, tokiose kaip Argentina, Vengrija, Rusija ir Turkija, kuriose buvo nustatyta, kad kai kurie susirūpinimo aplinka elementai, bet ne visa jų grandinė, paaiškina aplinką tausojantį elgesį, ketinimus ir pritarimą aplinkosaugos politikai. Norint įveikti klimato krizę, visame pasaulyje reikia bendrų pastangų ir nuoseklaus įsitraukimo į daugelį aplinką tausojančių elgsenų. Susirūpinimas aplinka yra daug žadantis veiksnys, galintis paskatinti daugelį aplinką tausojančių elgsenų. Todėl būsimuose tyrimuose būtų galima patikrinti, ar susirūpinimas aplinka yra susijęs su įvairia aplinką tausojančia elgsena kitose šalyse ir kontekstuose, pvz., šalyse, kurios patiria didelį klimato kaitos poveikį, socialinius ir ekonominius sunkumus, bet retai įtraukiamos į aplinką tausojančio elgesio tyrimus. Tam tikros bendruomenės ir amžiaus grupės, pavyzdžiui, žmonės iš ekonominius sunkumus patiriančių šeimų, pensininkai ir etninės mažumos, taip pat retai

įtraukiamos į tyrimus net išsivysčiusiose šalyse (Ghai, 2021). Ateities tyrimai galėtų įtraukti įvairesnius imties kriterijus, lyties, tautybės, reprezentatyvumo ir kitų svarbių charakteristikų atžvilgiu (Ghai, 2021; Henrich ir kt., 2010).

Reprezentatyvumo problema išlieka ir antrame skyriuje. Sisteminė literatūros apžvalga leido aptikti tyrimus, kurie daugiausia buvo atliekami su studentėmis Europoje (n = 3393; 2 skyrius); tik vienas tyrimas iš 14 gali būti laikomas tikrai reprezentatyviu (Hine ir kt., 2013), bet bendras kitų tautybių dalyvių imties dydis (n = 5120; Australija, Kinija ir JAV) viršijo Europos imties dydį. Nors sisteminė literatūros apžvalga neleidžia kontroliuoti imčių įvairovės ir subalansuoti lytį, tautybę ar kitus svarbius imties ypatumus, tačiau būsimuose tyrimuose, kuriuose būtų tikrinamas ryšys tarp žmogaus ir aplinkos ryšį reprezentuojančių konstruktų, galima būtų atkreipti dėmesį į imtis, kurios yra rečiau tiriamos ir tiksliau reprezentuoja bendrą populiaciją.

Aplinkosauginis tapatumas yra svarbus veiksnys, paaiškinantis aplinką tausojantį elgesį ir glaudžiai susijęs su kitais konstruktais, reprezentuojančiais žmogaus ir aplinkos ryšį, pavyzdžiui, ryšį su gamta (antras skyrius). Aplinkosauginis tapatumas ir ryšys su gamta yra susiję su aplinką tausojančiu elgesiu, tačiau aplinkosauginis tapatumas yra stipriau susijęs su elgesiu (Vesely ir kt., 2021). Aplinkosauginis tapatumas ir ryšys su gamta turi bendras teorines šaknis, nes abu gali būti kilę iš biosferinių vertybių (Schultz, 2002; van der Werff ir kt., 2013b). Vienas tyrimas iš tiesų rodo, kad ryšys su gamta ir biosferinės vertybės yra glaudžiai susiję (Martin ir Czellar, 2017). Ateities tyrimai galėtų patikrinti, koks vaidmuo tenka ryšiui su gamta aiškinant ryšį tarp biosferinių vertybių, aplinkosauginio tapatumo, asmeninių normų ir aplinką tausojančio elgesio. Vienas iš galimų ryšio su gamta vaidmenų paaiškinant šį ryšį – aplinkosauginis tapatumas gali medijuoti ryšio su gamta ir aplinką tausojančio elgesio ryšį. Būsimi tyrimai galėtų nagrinėti šiuos ryšius skirtingose elgsenose ir galimą mediacijos efektą.

Papildant aukščiau išdėstytą mintį, tikėtina, kad žmonės, jaučiantys tvirtą ryšį su gamta, gali norėti elgtis aplinką tausojančiu būdu, kad apsaugotų gamtą. O žmonės, pasižymintys tvirtu aplinkosauginiu tapatumu, gali elgtis aplinką tausojančiu būdu, nes nori elgtis teisingai, bet nebūtinai dėl vienybės jausmo su natūralia aplinka. Kokybiniai tyrimai iš tiesų rodo, kad žmonės tausoja aplinką dėl įvairių priežasčių, tokių kaip poreikis rūpintis savo sveikata ir išlikti, poreikis išlaikyti ekosistemų pusiausvyrą, bet ir dėl altruistinių priežasčių

– būtinybės išsaugoti gamtą ateities kartoms (Gustafson ir kt., 2022). Būsimi tyrimai galėtų patikrinti, ar žmonės, jaučiantys stiprų ryšį su gamta, ir žmonės, turintys tvirtą aplinkosauginį tapatumą, tausoja aplinką dėl skirtingų motyvų. Tai, kad žmonės tausoja aplinką ne tik dėl biofilinių motyvų, gali būti dar vienas įrodymas, kad susirūpinimo aplinka aspektas – aplinkosauginis tapatumas, yra universalus veiksnys, galintis paskatinti aplinką tausojantį elgesį. Bet ne tik tų, kurie jaučia ryšį su natūralia aplinka, bet ir tų, kurie dėl kitų priežasčių elgiasi aplinkai palankiai.

Trečiame skyriuje nustatyta, kad susirūpinimas aplinka yra susijęs su kai kuriuo aplinką tausojančiu elgesiu, bet ne su kiekvienu. Gali būti ir kitų veiksnių, pvz., numanomos elgesio sąnaudos arba kontekstinės kliūtys, silpninančios susirūpinimo aplinka poveikį aplinką tausojančiam elgesiui (t. y. tausojančiam degalus vairavimo stiliui ir aplinkai draugiško transporto naudojimui). Tačiau šioje disertacijoje nubuvo tirtas šių galimų veiksnių poveikis konkrečiam elgesiui. Būsimi tyrimai galėtų užpildyti šią spragą ir tyrinėti galimus elgesį ribojančius veiksnius, kurie trukdo žmonėms vairuoti taip, kad tausotų degalus, ir naudotis aplinkai draugišku transportu. Šie veiksniai gali būti specifiški ir elgesiui, ir kontekstui. Pavyzdžiui, žmonės gali vengti važiuoti viešuoju transportu dėl funkcinių trūkumų (pvz., nepakankamo vėsinimo, šildymo ar švaros), bet ir dėl to, kad naudojimasis viešuoju transportu gali pakenkti jų įvaizdžiui (pvz., įsitikinimo, kad sėkmingi žmonės važinėja automobiliu, o ne viešuoju transportu). Dar vienas veiksnys, galintis sutrukdyti žmonėms tausoti aplinką, net jei jų susirūpinimas aplinka stiprus, yra įprotis. Penktame skyriuje nustatyta, kad įprotis buvo glaudžiai susijęs su trimis iš keturių paauglių aplinką tausojančių elgsenų, tokių kaip vandens buteliuose vartojimas. Žmonių stiprios biosferinės vertybės ir santykinai stiprus aplinkosauginis tapatumas nepaaiškino elgesio pirkti vandenį buteliuose, o tai rodo, kad įprotis gali užkirsti kelią susirūpinimui aplinka paveikti aplinką tausojantį elgesį. Taigi būsimuose tyrimuose, vertinant ryšį tarp susirūpinimo aplinka ir aplinką tausojančio elgesio, galima būtų kontroliuoti šiuos galimus veiksnius, susijusius su elgesiu ir kontekstu.

### 2.1.5 Praktinė reikšmė

Galima manyti, kad žmonės netausoja aplinkos, nes jų silpnos biosferinės vertybės, aplinkosauginis tapatumas ir asmeninės normos. Nors tai gali būti

tiesa, tačiau žmonės, jaučiantys stiprų susirūpinimą aplinka, gali netausoti aplinkos dėl kitų priežasčių. Pavyzdžiui, dėl konteksto ar su amžiumi susijusių priežasčių žmonių susirūpinimas aplinka gali netapti konkrečiu elgesiu. Tačiau šioje disertacijoje parodyta, kad susirūpinimas aplinka yra gana universalus veiksnys, paaiškinantis įvairią aplinką tausojančią elgseną, net jei žmonės patiria kitų rimtų socialinių, demografinių ir ekonominių problemų ar juos veikia su amžiumi susiję ypatumai, tokie kaip bendraamžių įtaka paauglystėje, kuri gali susilpninti susirūpinimo aplinka poveikį elgesiui. Be to, susirūpinimas aplinka paaiškina aplinką tausojantį elgesį labai panašiai kaip ir elgesiui specifiški veiksniai. Tai rodo, kad biosferinės vertybės, aplinkosauginis tapatumas ir asmeninės normos gali būti naudojamos intervencijose Lietuvoje (ir tokiose šalyse kaip Lietuva, turinčiose bendrą istorinį pagrindą) ir skirtingų amžiaus grupių žmonėms (pvz., paaugliams), ne tik gerai ištyrinėtose Vakarų šalyse.

Dauguma tirtų aplinką tausojančių elgsenų buvo susijusios su susirūpinimu aplinka Lietuvoje tarp paauglių. Tačiau susirūpinimas aplinka nepaaiškino kai kurios suaugusiųjų (pvz., degalus tausojančio vairavimo stiliaus, trečias skyrius) ir paauglių elgsenos (pvz., nesupakuotų prekių pirkimo, penktas skyrius). Tai gali rodyti, kad reikia pagalbos norint, kad susirūpinimas aplinka taptų tam tikru aplinką tausojančiu elgesiu taikant intervencijas, nes žmonės gali to nežinoti arba jie gali nemanyti, kad tam tikras elgesys kenkia aplinkai (Pirmas paveikslas).

Praktikams gali būti naudinga žinoti, kad kai kurį elgesį lemia tiesiogiai tam tikri susirūpinimo aplinka aspektai, o ne per tarpinius kintamuosius. Pavyzdžiui, aplinkosauginis tapatumas ir asmeninės normos valgyti vegetarišką maistą buvo tiesiogiai susijusios su suaugusiųjų vegetariško maisto pasirinkimu (penktas skyrius). Tai rodo, kad žmonės elgiasi aplinką tausojančiu būdu nebūtinai todėl, kad rūpinasi gamtos apsauga, o todėl, kad jie laiko save aplinkai draugiškais žmonėmis ir jaučia moralinę pareigą tausoti aplinką. Taigi pasireiškus kai kuriam elgesiui gali būti praktiška pabrėžti, kad svarbu elgtis teisingai (t. y. paveikti žmogaus moralinį įsipareigojimą). Ši strategija gali būti ypač aktuali paskatinant elgesį, kurį būtų sunku motyvuoti gamtosaugos motyvais.

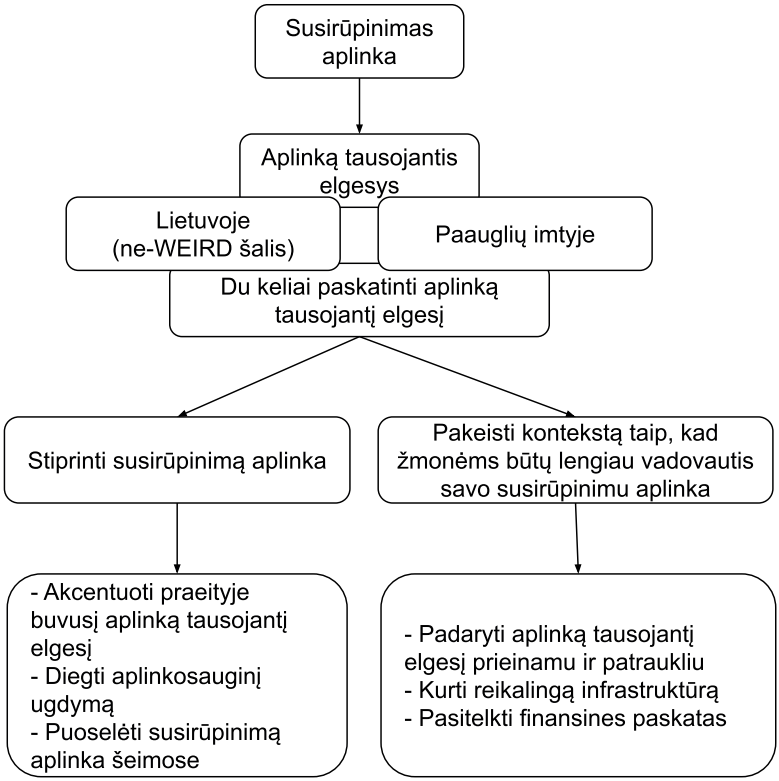
Nustatyta, kad yra stiprus ryšys tarp tėvų ir jų paauglių vaikų susirūpinimo aplinka. Šalyse, kuriose aplinkosauginis švietimas nėra švietimo sistemos dalis, šeima gali būti svarbus kanalas stiprinant aplinkosaugos klausimus. Aplinko-

saugos nevyriausybinės organizacijos galėtų orientuotis į šeimas su vaikais, pavyzdžiui, bendruomenės lygmeniu.

Nustatyta, kad paauglių socialinės normos stipriai susijusios su jų asmeninėmis normomis. Šie rezultatai sutampa su tyrimų rezultatais, rodančiais, kad paaugliai yra jautresni savo artimųjų įtakai nei suaugusieji. Tai gali reikšti, kad socialinių normų taikymas intervencijose gali būti ypač svarbus siekiant sustiprinti paauglių asmenines normas tausoti aplinką ir skatinant aplinkai palankų elgesį.

Apibendrinus galima teigti, kad disertacijoje išryškinama susirūpinimo aplinka svarba paaiškinant daugybę aplinką tausojančių elgsenų. Taigi susirūpinimas aplinka gali būti patrauklus veiksnys intervencijose, skatinančiose aplinką tausojantį elgesį. Tačiau, atsižvelgiant į tai, kad įrodymai rinkti skerspjūvio tyrimais, rekomenduojama, kad intervencijos, kurios buvo sėkmingos stiprinant susirūpinimo aplinka elementus VIITD šalyse tarp suaugusiųjų, pirmiausia turėtų būti patikrintos Lietuvoje (ir kitose šalyse) paauglių imtyje, kad galėtų būti taikomos platesniu mastu.

**1 pav.** Aplinką Tausojančio Elgesio Skatinimo Strategijos




### 2.1.4 Išvados

Atsižvelgus į tai, kad aplinkosauginis tapatumas yra svarbi grandis biosferinių vertybių ir aplinką tausojančio elgesio ryšiui, šioje disertacijoje pirmiausia siekta ištirti sąsajas tarp aplinkosauginio tapatumo bei žmogaus ir aplinkos ryšį reprezentuojančių konstruktų, tokių kaip aplinkos tapatumas ir ryšys su gamta. Rezultatai parodė, kad aplinkosauginis tapatumas yra atskiras teorinis darinys, atskirtas nuo ryšio su gamta ir aplinkos tapatumo. Nors konstruktus sieja teoriniai bendrumai, ryšys su gamta, aplinkosauginis tapatumas ir aplinkos tapatumas motyvuoja žmones tausoti aplinką dėl skirtingų motyvų. Pagrindinis šios disertacijos klausimas buvo išsiaiškinti, kiek susirūpinimo aplinka elementai,

biosferinės vertybės, aplinkosauginis tapatumas ir asmeninės normos elgtis aplinką tausojančiu būdu, yra universalios, paaiškinančios aplinką tausojantį elgesį tuose kontekstuose, kurie dar iki šiol nebuvo tyrinėti, ir netyrinėtose amžiaus grupėse. Rezultatai rodo, kad susirūpinimas aplinka gali paaiškinti įvairią aplinką tausojančią elgseną ne VIITD šalyje (t. y. Lietuvoje), kuri, be aplinkos problemų, susiduria su įvairiomis socialinėmis, demografinėmis ir ekonominėmis problemomis, galinčiomis nustumti aplinkosaugos klausimus į antrą planą ir taip silpninti ryšį tarp susirūpinimo aplinka ir aplinką tausojančio elgesio. Ryšys tarp susirūpinimo aplinka ir aplinką tausojančio elgesio buvo nustatytas ir paauglių imtyje. Paauglių aplinką tausojantį elgesį gali veikti kiti su paauglyste susiję veiksniai, tokie kaip socialinės normos arba centralizuoto aplinkosauginio švietimo trūkumas, kuris skatintų paauglių susirūpinimą aplinka ir aplinką tausojantį elgesį. Taip pat nustatyta, kad tėvų ir jų paauglių vaikų susirūpinimas aplinka yra stipriai susijęs, vadinasi, šeimos galėtų būti kelias, per kurį būtų stiprinamas susirūpinimas aplinka. Pažymėtina, kad susirūpinimas aplinka nepaaiškino kai kurio aplinką tausojančio suaugusiųjų ir paauglių elgesio. Tai rodo, kad gali prireikti pagalbos sumažinant atotrūkį tarp susirūpinimo aplinka ir tam tikro aplinką tausojančio elgesio. Kai kuris aplinką tausojantis elgesys buvo paaiškintas tam tikrais susirūpinimo aplinka elementais tiesiogiai, bet ne per moralinį kelią (t. y. asmenines normas); tai galėtų reikšti, kad kai kurių žmonių aplinką tausojantį elgesį gali motyvuoti noras elgtis teisingai arba noras matyti save kaip asmenį, kuris tausoja aplinką, bet ne todėl, kad jie turi tikslą tausoti aplinką. Apibendrinus rezultatus galima teigti, kad biosferos vertybės buvo susijusios su aplinkosauginiu tapatumu, o jis savo ruožtu buvo susijęs su asmeninėmis normomis elgtis aplinką tausojančiu būdu ir galiausiai – su aplinką tausojančiu elgesiu suaugusiųjų ir paauglių imtyje ne VIITD šalyje. Tai rodo, kad į aplinkosaugos politiką, numatančią skatinti aplinką tausojantį elgesį, galėtų būti svarstoma įtraukti susirūpinimo aplinka stiprinimą, prieš tai įvertinus, ar užsienio šalių intervencijos yra veiksmingos įvairioms amžiaus grupėms ir Lietuvos kontekste.

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**Audra Balundė**

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*The scope and the seriousness of ecological challenges urge us to identify general factors that could facilitate various pro-environmental behaviors among different people in different contexts. Therefore, the main question of this dissertation was to what extent environmental considerations, namely biospheric values, environmental self-identity and personal norms to engage in pro-environmental behavior are universal in explaining variety of pro-environmental behaviors in a context and sample that was not tested previously, namely in Lithuania and among adolescents. We first demonstrated that environmental self-identity is a theoretically and empirically distinct construct from other constructs representing human-environment relationship, and that it is a valuable target for interventions aimed at promoting many different pro-environmental behaviors. Next, we found that general environmental considerations, namely biospheric values, environmental self-identity and personal norms, can explain various pro-environmental behaviors in Lithuania, despite the fact that people are dealing with various social, demographic and economic issues besides environmental issues. Further, environmental considerations explain many pro-environmental behaviors among adolescents, even though they experience age related peculiarities such as increased susceptiveness to peer influence. In fact, we found that general environmental considerations explain adolescents' pro-environmental behavior to a similar extent as behavior-specific factors, such as habits or intentions. Finally, we found that parents' and adolescents' environmental considerations were strongly related, suggesting that families could potentially be an important basis for shaping individuals' environmental considerations. Environmental considerations did not explain some pro-environmental behaviors though, both for adults and adolescents, suggesting that there may be important barriers for people to act upon their pro-environmental considerations, which might be characteristic to a country, context or a specific age group. Building on the findings, we proposed two routes to connect people's environmental considerations and behavior, namely*

*strengthening the environmental considerations and implementing contextual changes to enable people to act upon their environmental considerations.*

*Šiandieninių ekologinių iššūkių, mastas ir rimtumas skatina ieškoti veiksnių, kurie motyvuotų įvairius aplinką tausojančius elgesius skirtingiems žmonėms ir įvairiuose kontekstuose. Todėl, pagrindinis šios disertacijos klausimas buvo, kiek bendrieji susirūpinimo aplinka komponentai, tokie kaip biosferinės vertybės ir aplinkosauginis tapatumas, o taip pat asmeninės normos tausoti aplinką, gali paaiškinti įvairius aplinką tausojančius elgesius kontekste ir imtyje, kurie nebuvo tirti (t. y., Lietuvoje ir paauglių imtyje). Pirma nustatėme, kad aplinkosauginis tapatumas yra atskiras teorinis darinys, nuo ryšio su gamta ir aplinkos tapatumo. Aplinkosauginis tapatumas galėtų būti naudojamas intervencijose, skirtose skatinti aplinką tausojantį elgesį. Toliau išsiaiškinome, kad susirūpinimo aplinka komponentai, gali paaiškinti įvairius aplinką tausojančius elgesius Lietuvoje, nepaisant to, kad žmonės Lietuvoje, be aplinkosaugos problemų, susiduria su įvairiomis socialinėmis, demografinėmis ir ekonominėmis problemomis. Be to, susirūpinimo aplinka komponentai paaiškino daugelį aplinką tausojančių elgesių paauglių imtyje, net ir turint mintyje, kad kiti, jų amžiui būdingi ypatumai (pvz., padidintas jautrumas bendraamžių įtakai), galėtų turėti daugiau įtakos elgesiui nei susirūpinimas aplinka. Įdomu tai, kad susirūpinimo aplinka komponentai paaiškino paauglių aplinką tausojantį elgesį panašiai gerai, kaip ir specifiški elgesiui veiksniai, tokie kaip pavyzdžiui įpročiai ar socialinės normos. Galiausiai, nustatėme, kad tėvų ir paauglių susirūpinimo aplinka komponentai buvo stipriai susiję, o tai rodo, kad šeima gali būti svarbus pagrindas asmens susirūpinimo aplinka formavimui. Susirūpinimas aplinka nepaaiškino kai kurių aplinką tausojančių elgesių suaugusiųjų ir paauglių imtyse. Tai rodo, kad gali būti svarbių kliūčių, trukdančių susirūpinimui aplinka motyvuoti aplinką tausojantį elgesį. Kliūtys gali būti susijusios su šalies kontekstu ar amžiaus grupės ypatumais. Remiantis gautais rezultatais, pasiūlėme du būdus, kaip pasiekti, kad žmonių susirūpinimo aplinka komponentai motyvuotų jų elgesį. T. y., stiprinti susirūpinimo aplinką intervencijomis ir pritaikyti kontekstą taip, kad jis skatintų žmones elgtis vadovaujantis savo susirūpinimu aplinka.*

Audra Balundė
SUSIRŪPINIMO APLINKA GALIA PAAIŠKINTI APLINKĄ TAUSOJANTĮ ELGESĮ SKIRTINGIEMS ŽMONĖMS ĮVAIRIUOSE KONTEKSTUOSE

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Socialiniai mokslai, psichologija (S 006)

Mykolo Romerio universitetas
Ateities g. 20, Vilnius
Puslapis internete www.mruni.eu
el. p. roffice@mruni.eu
Tiražas 20 egz.

Parengė spaudai Douwe Oppewal

Spausdino UAB „Šiaulių spaustuvė“
P. Lukšio g. 9G, 76200 Šiauliai
el. p. info@dailu.lt
http://siauliuspaustuve.lt