A look on the bright side of an environmentally-friendly life

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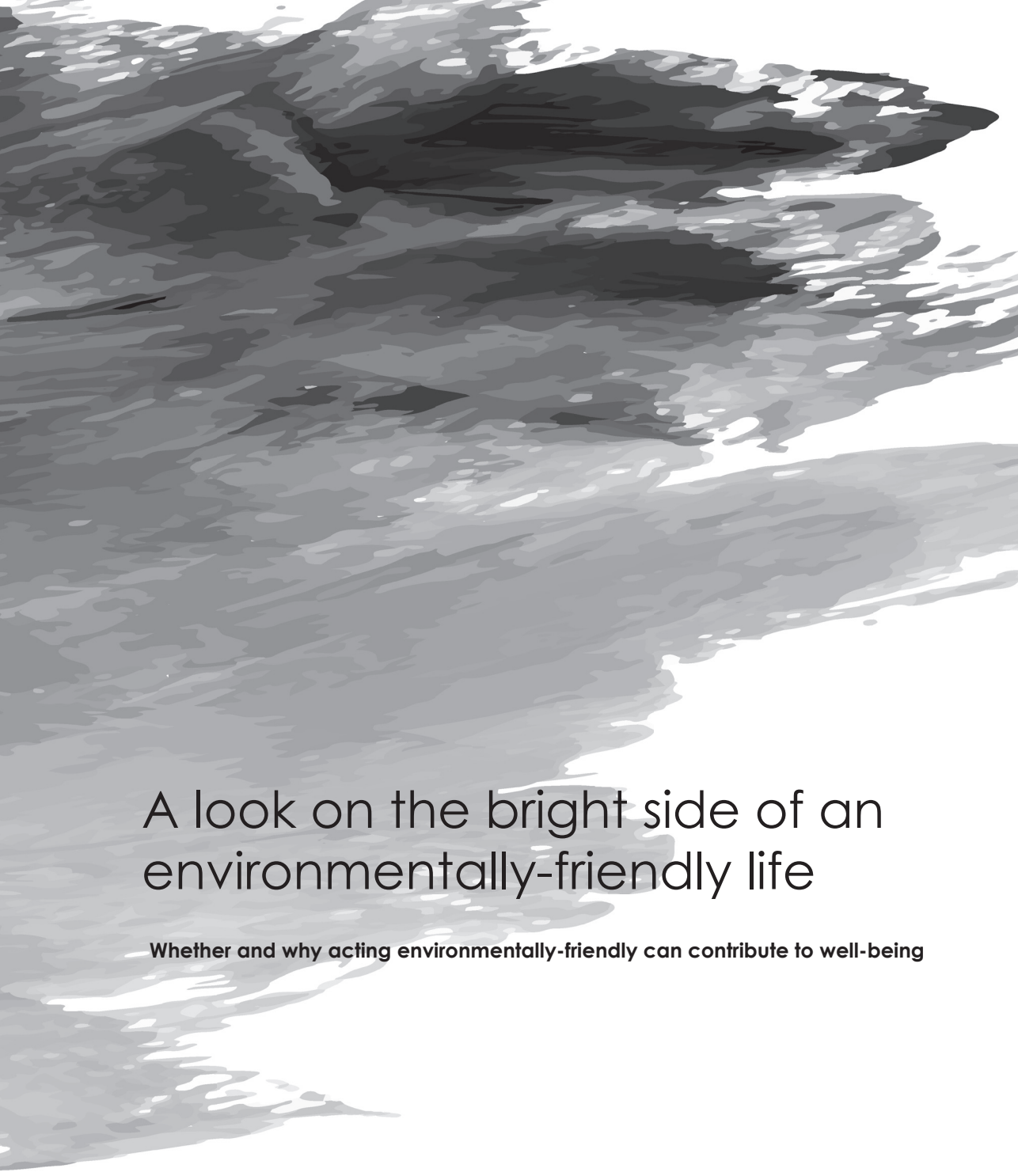

A look on the bright side of an environmentally-friendly life

Whether and why acting environmentally-friendly can contribute to well-being

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Chapter 1

General introduction

Increasing environmental quality is an important goal for many governments around the world. As for instance agreed upon during the Paris climate conference (COP21), it is an international aim to keep global temperature rises well below 2°C above pre-industrial levels (European Commission, December 23, 2015). At the same time, an increasing number of governments see citizens' well-being as an important indicator of a country's welfare. As a result, well-being research is more frequently used as a guide to develop policies that enable people to live better lives (Helliwell, Layard, & Sachs, 2012). Yet, striving towards a better environmental quality and higher human well-being are sometimes seen as separate, possibly even conflicting goals, as acting environmentally-friendly often involves some degree of effort and discomfort. As De Young puts it: "While frugality [a specific type of environmentally-friendly behavior] may be accepted as a necessary feature of the future it is usually portrayed as an onerous undertaking, one requiring personal sacrifice of the highest order. People, it is argued, are being asked to give up a modern, high-technology existence for an austere, bleak but needed substitute" (De Young, 1990-1991, p. 216). In contrast to this view, we will argue in the current dissertation that reaching environmental quality and human well-being are not necessarily at odds. In fact, we examine whether and why engaging in environmentally-friendly behavior, that is behavior that harms the environment as little as possible or even benefits the environment (Steg & Vlek, 2009), may *contribute* to individual well-being.

Various scholars have suggested and shown that environmentally-friendliness and well-being are intimately linked (Brown & Kasser, 2005; Helliwell et al., 2012; Kasser & Sheldon, 2002; Welsch & Kühling, 2011; Xiao & Li, 2011). For example, correlational studies revealed that consuming in an environmentally-friendly way is related to greater personal well-being (Brown & Kasser, 2005), higher overall life-satisfaction (Xiao & Li, 2011), and more happiness (Kasser & Sheldon, 2002). Explanations for this link between environmentally-friendly behavior and well-being often do not focus on characteristics of the behavior itself, but rather point to factors external to the behavior. Some suggest that the things that actually make us happy, like social relationships and personal growth, happen to be sustainable at the same time (Beavan, 2009; Csikszentmihalyi, 2000; T. Jackson, 2005; Kasser, 2009). Others propose that specific personal traits such as being mindful both make people act environmentally-friendly and increase well-being (Brown & Kasser, 2005). In the current dissertation we wondered whether the relationship between environmentally-friendly behavior and well-being can indeed only be explained by factors external to this behavior. Could characteristics of environmentally-friendly behavior *itself* not make people feel good as well?

We first conducted a literature review that analyzed why environmentally-friendly behavior itself may contribute to or detract from well-being (Chapter 2). More specifically, we examined the (anticipated) positive emotions that this type of behavior may elicit. In our review we distinguished between hedonic well-being, as reflected in fleeting positive emotions such as experiencing pleasure, and eudaimonic well-being, as reflected in deeper positive emotions such as experiencing meaning. In the remainder of this thesis, however, we examine meaning as an explanation why environmentally-friendly behavior can elicit positive emotions in general.

We argued that pleasure and meaning may be linked to environmentally-friendly behavior in differing degrees. Pure pleasure or comfort may only be associated with specific environmentally-friendly behaviors. While cycling on a warm spring day may for instance be experienced as very comfortable, taking a cold shower in winter is most probably not. In fact, it may particularly be the latter group of environmentally-friendly behaviors that leads people to think acting environmentally-friendly threatens well-being. Viewing environmentally-friendly behavior solely as a threat to well-being, however, overlooks that it can also be perceived as meaningful behavior. As all forms of environmentally-friendly behaviors have in common that they benefit the quality of the environment and the well-being of other people, this type of behavior can be seen as moral and thereby meaningful behavior (Heberlein, 1972; Leopold, 1949; Thøgersen, 1996). While characteristics of specific environmentally-friendly behavior can bring comfort or discomfort, it may thus be environmentally-friendly behavior *as such* that brings meaning.

In the subsequent empirical chapters of this dissertation (Chapters 3, 4 and 5) we will examine the role of meaning more closely. Specifically, we aim to test whether acting environmentally-friendly *itself* may elicit positive emotions, and whether these positive emotions ensue from the meaning that is attributed to this type of behavior. Chapter 3 will explore the emotional association people have with environmentally-friendly behavior: is this association positive? In Study 3.1 we examine people's explicit association with behavior that can benefit the environment. Using a scenario study we will test whether people expect to feel more positive and less negative emotions after acting environmentally-friendly than after acting environmentally-unfriendly. In Study 3.2 we take a step further and look at the implicit association people have with environmentally-friendly words. By using an Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998) we will examine whether environmentally-friendly and positive words are also implicitly linked, thereby reducing the likelihood that our results are caused by socially desirable answering.

Besides testing whether environmentally-friendly behavior itself can make people feel good, we also aim to examine *why* this link may exist. If meaning indeed is a key

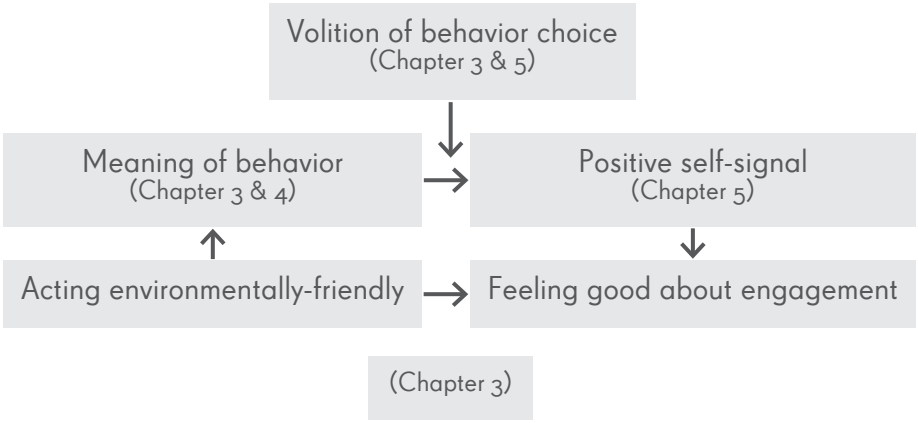
factor, more meaningful behavior should elicit more positive emotions. To test this reasoning, Study 3.1 examines whether different indicators of meaning affect the emotional association people have with environmentally-(un)friendly behavior. We will look at factors that give the behavior itself more meaning, and at factors that lead people to attach more personal meaning to the behavior. Specifically, as its benefit for the environment may make behavior moral and thereby meaningful, we expect that people have a stronger positive association with behavior that is perceived to be more environmentally-friendly (behavioral meaning). Furthermore, as they may attribute more personal meaning to environmental quality than others, we expect that people have a stronger positive association with environmentally-friendly behavior when they value the environment more strongly and feel more morally obliged to act this way (personal meaning). In Chapter 4, we further test our reasoning by explicitly measuring whether behavior that is perceived to be more environmentally-friendly is perceived to be more meaningful as well. In two scenario and one field study we will examine whether the meaning associated with this behavior can explain why people feel better about engaging in behavior they perceive to be more environmentally-friendly.

If meaning indeed plays a role in explaining why acting environmentally-friendly feels good, the next question that arises is what leads meaning to have this effect. As we theorize in Chapter 2, engagement in meaningful behavior could elicit positive emotions because this behavior signals something positive about who you are. One of the pillars on which people base their self-image, is their own actions (Bem, 1967; Bem, 1972). Acting environmentally-friendly can for instance lead people to see themselves as a more environmentally-friendly person (Cornelissen, Pandelaere, Warlop, & Dewitte, 2008; Van der Werff, Steg, & Keizer, 2014b). Following the same reasoning, doing something meaningful may boost someone's self-image: by doing something meaningful you signal to yourself you are a good person. Having a positive self-image, in turn, is an important determinant of well-being (Baumeister, 1993; Taylor & Brown, 1988). The positive effect meaningful behavior has on one's self-image (positive self-signal) may therefore explain why acting this way can feel good. If environmentally-friendly behavior is perceived to be meaningful behavior, acting in this way may thus boost one's self-image, thereby eliciting positive emotions.

As voluntary behavior is more likely to be internally attributed (Ryan & Deci, 2000a; Ryan & Deci, 2000b), *making the choice* to engage in certain behavior may particularly reveal something about who you are – not only to others, but also to yourself (Bodner & Prelec, 2003). This suggests that acting environmentally-friendly out of your own volition may send a stronger positive self-signal and therefore elicit stronger positive emotions than acting this way out of external pressure. Following this reasoning, we test whether people have a stronger positive association with voluntary

engagement in environmentally-friendly behavior than with non-voluntary engagement in environmentally-friendly behavior in Study 3.1. Building on this study, we further test our reasoning by explicitly measuring whether acting environmentally-friendly affects how environmentally-friendly people perceive themselves to be (Study 5.1) and elicits a general positive self-image (Study 5.2). In one scenario and one field study we test whether the self-image this behavior elicits can explain why people feel good about engaging in environmentally-friendly behavior in Chapter 5.

Figure 1 Theoretical model studied in this dissertation



Additional remarks

The empirical chapters of this dissertation study different parts of our model step by step (see Figure 1). As each chapter was written as an individual paper, there may be some overlap in the theoretical reasoning and some differences in the structure of the chapters. In Chapter 6 we discuss and integrate the main findings of the studies, and elaborate on their theoretical and practical implications. As all research reported is the result of fruitful collaborations, the personal pronoun "we" instead of "I" is being used throughout this dissertation.

Chapter 2

Explaining the paradox

How pro-environmental behavior can both thwart and foster well-being

Abstract

Although environmentally-friendly behavior is often believed to be difficult, aggravating, and potentially threatening one's quality of life, recent studies suggest that people who behave in a more environmentally-friendly way are actually more satisfied with their lives. In this manuscript, we aim to explain this apparent paradox by reviewing theoretical arguments and empirical evidence for both sides of the coin: why would acting environmentally-friendly decrease one's well-being, and why would it increase one's well-being? We conclude that part of the answer lies in a different view on what well-being entails, and more specifically, whether the focus is on hedonic well-being (i.e., feeling pleasure) or eudaimonic well-being (i.e., feeling meaningful).

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Introduction

Whether the topic is the extinction of fish (McIntyre, Jones, Flecker, & Vanni, 2007), the emission of greenhouse gasses (United Nations, 2011), or the degradation of natural resources (Baland & Platteau, 1996), most researchers and politicians agree that the transition to an environmentally sustainable society is an important goal in the coming years. As defined at the Oslo symposium on Sustainable Consumption (Norwegian Ministry of the Environment, 1994), a sustainable society is as a society in which "the use of goods and services […] respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations". For an effective transition to such a sustainable society, it is important that, next to technological and policy developments, individuals change their behavioral patterns to reduce their environmental impact (Chiras, 2011; IPCC (Intergovernmental Panel on Climate Change), 2007).

Set your heart on doing good.
Do it over and over again,
and you will be filled with joy.
A fool is happy
until his mischief turns against him.
And a good man may suffer
until his goodness flowers.
Buddha

Unfortunately, behaving in an environmentally-friendly way is often perceived as difficult, aggravating, and potentially threatening one's quality of life (Brown & Kasser, 2005; De Young, 2000; T. Jackson, 2005; Kaplan, 2000; O'Brien, 2008), thus as something one would not do out of self-interest: "While frugality may be accepted as a necessary feature of the future it is usually portrayed as an onerous undertaking, one requiring personal sacrifice of the highest order. People, it is argued, are being asked to give up a modern, high-technology existence for an austere, bleak but needed substitute" (De Young, 1990-1991, p. 216). The perception that environmentally-friendly behavior has negative effects on well-being has made it difficult to make big and concrete steps towards transition. But is this perception accurate?

As the definition of sustainability already shows, engaging in sustainable behavior is actually meant to "bring a better quality of life" of individuals in the long run (Norwegian Ministry of the Environment, 1994). Following this definition, environmentally-friendly behavior can thus only be called sustainable if it does not threaten human well-being. Indeed, this is also one of the basic premises in the World Happiness Report (Helliwell et al., 2012), in which it is claimed that "the quest for happiness is intimately linked to the quest for sustainable development" (p. 3). According to the World Happiness Report, it should be perfectly possible to adopt lifestyles and technologies that improve happiness and reduce human damage to the environment at the same time. A few empirical studies support this claim and even suggest that

behaving in an environmentally-friendly way may lead to an increase in well-being. For example, consuming in an environmentally-friendly way was found to be related to greater personal well-being (Brown & Kasser, 2005), higher overall life-satisfaction (Xiao & Li, 2011), and more happiness (Kasser & Sheldon, 2002). However, as these results are all based on correlational research, causality cannot be implied.

In sum, there seem to be two opposing views on the relationship between environmentally-friendly behavior and well-being: on the one hand, behaving environmentally-friendly is believed to decrease individual well-being, while on the other hand it is believed to increase individual well-being. By reviewing theoretical arguments for both positions, we will examine whether, when, and in what way environmentally-friendly behavior can affect the well-being of those who engage in it.

Defining well-being

Before we can make any inference about the effect of environmentally-friendly behavior on well-being, we first need to be clear on what well-being actually is. The discussion on the definition of well-being and what kind of life one should lead to "become happy" goes back to ancient philosophy, and is still going on today. This discussion usually boils down to two distinct views on what well-being entails: the hedonic versus the eudaimonic view (Ryan & Deci, 2001). Below, we will first define both types of well-being and next discuss possible effects of environmentally-friendly behavior on these two types of well-being.

Hedonic well-being

Hedonic well-being has its roots in the ancient philosophy of Aristippus, who taught that "the goal of life is to experience the maximum amount of pleasure, and that happiness is the totality of one's hedonic moments" (Ryan & Deci, 2001, pp. 143,144). The experiences to which "hedonic moments" refer can range from a narrow focus on physical pleasures and displeasures (Aristippus, in Diener, Napa Scollon, & Lucas, 2003) to a broad focus on the presence of benefits and absence of suffering in general (Bentham, in Diener et al., 2003).

Psychologists studying hedonic well-being mainly use a broad definition of this concept, which includes both physical and cognitive preferences and pleasures (Kubovy, 1999, in Ryan & Deci, 2001). Within this broad definition, not only physically pleasant moments such as having a nice dinner, but also cognitively pleasant moments such as the attainment of a goal can contribute to hedonic well-being.

Eudaimonic well-being

In contrast to the hedonic focus on the subjective experience of pleasure, the eudaimonic view on well-being defines being well as "living well" or "pursuing the right ends" (Ryan, Huta, & Deci, 2008). This view on well-being has its roots in Aristotle's Nicomachian Ethics, where he describes eudaimonic living as using "one's best human capacities by actively pursuing virtues and excellences" (In Ryan et al., 2008, p. 143). These virtues and excellences refer to concepts like courage, generosity, wisdom and being fair; things that are intrinsically worth pursuing and do not derive their worth from the external benefits they can bring. Following Aristotle's view on well-being, someone would only be classified as having high eudaimonic well-being if this person is doing virtuous things for the right reasons—the right reasons being that the person is deliberately choosing to act virtuously and is not doing so out of external temptation or coercion, or out of ignorance (Ryan et al., 2008). Importantly, to meet Aristotle's criteria of eudaimonia, doing the right thing for the right reasons does not have to give a good feeling.

Building on Aristotle's view, psychologists studying eudaimonic well-being generally define it as a way of living that is focused on what is intrinsically worthwhile to human beings (Ryan et al., 2008), as realizing valued human potentials (Ryan & Deci, 2001), or as striving to realize one's personal potential (Ryff & Keyes, 1995; Ryff & Singer, 2008). An important distinction between these psychological perspectives and the original definition by Aristotle is that although the latter does not imply that doing good also feels good, the psychological definitions do assume such a relationship. However, the "good feeling" of eudaimonic psychology refers to a deeper and higher sense of well-being—concepts such as having a purpose in life (Ryff & Keyes, 1995)—than the pleasure related emotions relevant for hedonic well-being, as discussed above.

The relationship between hedonic and eudaimonic well-being

Hedonic and eudaimonic well-being are often seen as two distinct visions of what well-being entails. It is even argued that pursuing a hedonic life of immediate gain of pleasure and avoidance of pain diverts people from living a "good", eudaimonic life (Ryan et al., 2008). Although most people will agree that having a good feeling is not the same as leading a good life, the two concepts are not mutually exclusive. For example, feeling good can lead to doing good, such as acting in a more pro-social way (Aknin, Dunn, & Norton, 2012), and the other way around, doing good also gives a good feeling (Waterman, Schwartz, & Conti, 2008), also referred to as "warm glow" (Andreoni, 1989; Andreoni, 1990). Following Ryff (1989), we will use the type of positive feelings as the criterion to distinguish hedonic and eudaimonic well-being: hedonic well-being in this review refers to fleeting positive emotions such as pleasure, while eudaimonic well-being in this review refers to deeper positive emotions such as feeling meaningful.

Environmentally-friendly behavior and well-being

As mentioned in the introduction, the relationship between environmentally-friendly behavior and well-being appears to be twofold; on the one hand, behaving environmentally-friendly is believed to decrease individual well-being, while on the other hand, behaving environmentally-friendly is believed to increase individual well-being. We propose that a possible explanation for these conflicting findings can be found in the different views on what well-being entails. More specifically, while behaving in an environmentally-friendly way may decrease hedonic well-being, it may increase eudaimonic well-being. Therefore, we will discuss the effect of environmentally-friendly behavior on hedonic and eudaimonic well-being in separate sections. We will start with discussing why and how behaving in an environmentally-friendly way may affect hedonic well-being, and then discuss why and how behaving in an environmentally-friendly way may affect eudaimonic well-being.

Environmentally-friendly behavior and hedonic well-being

Goal attainment and well-being

"We can only do so much" is an often-heard reason to not act environmentally-friendly. Environmental conditions will only improve when a large group of people adopts environmentally-friendly behaviors, so people may have the impression that their personal contribution will not be sufficient to save the planet. Furthermore, improvements in environmental conditions go slowly and result from complex interactions. The positive effects of one's individual environmentally-friendly behaviors on the condition of the earth are thus uncertain, complex, and situated in the future—in contrast to the personal benefits of environmentally-unfriendly behavior such as car use, which are certain, simple, and immediate (Vlek, 2000). Therefore, people who engage in environmentally-friendly behavior at the current moment cannot easily envision or experience the actual effects of their behavior on the condition of the earth. This gap between environmentally-friendly behavior and its positive environmental outcomes makes it difficult for people to judge the usefulness and effectiveness of personal engagement in environmentally-friendly behavior.

Difficulty to judge the usefulness and effectiveness of one's behavior may have negative consequences for the hedonic well-being of people who engage in environmentally-friendly behavior. The pursuit of goals that are perceived to be unattainable can lead to psychological distress and reduced well-being (Brunstein, 1993; Emmons, 1986; Wrosch, Scheier, Miller, Schulz, & Carver, 2003), and uncertainty about the usefulness and effectiveness of one's behavior makes it unclear whether and when the goal—in this case to protect the environment—will be attained. Research indeed showed that volunteers in environmental organizations experience reduced hedonic well-being when they feel they fail to attain their goal. More specifically, they feel

angry or sad because of the bad state nature is in, the feeling they are not doing enough, and the idea that not enough people are doing their bit (Eigner, 2001).

So why would anyone voluntarily choose to pursue a goal that cannot be attained, and on top of all, that makes them feel bad in the process? The critical point here is that goal pursuit reduces hedonic well-being only if the goal is perceived to be unattainable. And despite the uncertainty about whether and when the results will become visible, most people do feel they can effectively contribute to the protection of the environment (Eigner, 2001). One of the reasons people still feel their contribution can be worthwhile, is that "big" goals such as protecting the environment are typically reframed into smaller sub goals: to eventually protect the environment, we for instance first have to reduce our own energy consumption. By reframing a big goal into smaller, attainable goals, people get motivated to engage in this behavior (Kirby & Guastello, 2001) and derive hedonic well-being from their engagement (Wrosch et al., 2003). Indeed, environmental volunteers indicated they felt satisfied and proud when the specific environmental projects they worked on were successful (Eigner, 2001), even though the overarching goal of protecting the environment was not attained yet. So although the pursuit of an unattainable goal may lead to decreased hedonic well-being, environmentally-friendly behavior does not have to be dedicated to an unattainable goal, and therefore does not have to decrease hedonic well-being.

Consumption and well-being

Increasing personal consumption and national economic growth has long been seen as one of the most effective ways to increase the well-being of citizens (Burroughs & Rindfleisch, 2002a; Ekins, 1991; Sheth, Sethia, & Srinivas, 2011; Zhong & Mitchell, 2010). Indicators such as the Gross National Product (GNP) are used to see how well a country is doing, based on the assumption that the more people can consume, the higher their well-being. Following this assumption, Ekins (1991) even proposed that the possession and consumption of more hedonic products is seen as the "surest perceived route to personal happiness" (p. 244) and well-being. This would mean that putting a halt to increases of consumption, or to even decrease our consumption to more sustainable levels would be detrimental for our well-being—an environmentally-friendly lifestyle such as voluntary simplicity would be noble, but miserable.

Studies indeed show that consumption can bring hedonic well-being. For instance, shopping is used as a way to reduce stress or negative emotions (S. E. Jackson & Maslach, 2007; Kim & Rucker, 2012; Pierceall & Keim, 2007; Urizar Jr. et al., 2004), purchasing products can provide a hedonic well-being boost (Babin, Darden, & Griffin, 1994; Clark & Calleja, 2008), and consumption is linked to higher life satisfaction (Headey, Muffels, & Wooden, 2008; Oropesa, 1995). Since this literature suggests that consumption indeed increases hedonic well-being, it is often implied that consum-

ing in a more sustainable way would thus lead to a decrease in well-being. But is this really the case?

Literature suggests it is not. First, sustainable consumption does not necessarily equate to consuming less (T. Jackson, 2005; Sheth et al., 2011), but rather to consuming differently (Welsch & Kühling, 2009). Buying a pair of new shoes and buying a pair of second hand shoes both comes down to buying the same type of product: consuming the environmentally-friendly alternative still is consuming. The hedonic well-being derived from consuming can therefore still be derived from the consumption of environmentally-friendly alternatives[1].

Second, consumption is not the only way to gain hedonic well-being. Following Evans and Jackson (2008), consuming less does not have to mean that one will also have less pleasurable experiences. The pleasurable experiences that are derived from consumption can be replaced by pleasure found in other domains—sometimes even by environmentally-friendly behavior itself, as will be discussed in more depth below. So although consumption may bring hedonic well-being, sustainable consumption patterns do not have to decrease hedonic well-being.

Environmental conditions and well-being

One of the arguments that is used to explain why environmentally-friendly action would bring more hedonic well-being is that environmentally-friendly behavior leads to better environmental conditions, and people can live a more comfortable life under better environmental conditions (Clayton & Brook, 2005; Kasser, 2009). This means that on the macro level, environmentally-friendly behavior will increase hedonic well-being by enhancing the environmental conditions people live in.

There is indeed some evidence for this relationship. For example, nationwide pollution (Arvin & Lew, 2012; Welsch, 2007) and loss of biodiversity (Balmford, Bond, & Cowling, 2005; Kellert, 1996; Winter & Koger, 2003) have a negative effect on the well-being of inhabitants, lower CO_2 emission per unit GDP is related to higher well-being in countries (Zidanšek, 2007), and mean life satisfaction is higher in countries that score higher on the Environmental Sustainability Index—although this effect is very small (Bonini, 2008). This literature indeed seems to suggest that, on the macro level, environmentally-friendly behavior could increase hedonic well-being by enhancing the environmental conditions people live in.

1 Although environmentally-friendly alternatives may act as replacements for the hedonic well-being "buying stuff" provides, the environmentally-friendly products themselves may be less comfortable than their environmentally-unfriendly counterparts. We will come back to this point in the section on environmentally-friendly behavior and pleasure.

However, since all studies mentioned above are correlational, it is difficult to establish that better environmental conditions lead to increased hedonic well-being. Furthermore, the change in environmental conditions goes slowly, depends on the environmentally-friendly action of a large group of people, and environmental conditions also affect those who do not act environmentally-friendly. Therefore, enhanced quality of the environment cannot explain why the well-being of specifically those people who act environmentally-friendly will increase. To explain the relationship between environmentally-friendly behavior and well-being on the individual (micro) level, other mechanisms might therefore be more suitable.

Environmentally-friendly behavior and pleasure

An individual level mechanism that could explain how environmentally-friendly behavior brings hedonic well-being is that environmentally-friendly products or behavior can bring inherent pleasure. For instance, some people perceive organic food as tastier than non-organic food (Radman, 2005; Zanoli & Naspetti, 2002). Thus for those who perceive organic food as tastier, eating organic food not only benefits the environment, but also brings pleasure. In line with this, environmentally-friendly behavior is found to be intrinsically satisfying for some (De Young, 2000), and, as mentioned in the section on consumption and well-being, living a sustainable lifestyle is argued to be pleasurable in itself. As Evans and Jackson (2008) describe, "living a sustainable lifestyle can provide for the pleasure and desire that is so central to consumption and accounts thereof. These pleasures, according to the respondents' narratives, ranged from the 'simple pleasures' associated with energy saving rituals in the home through the creative indulgence involved in creating a 'whole new garment' by repairing old or broken clothing to wholesale shifts in the way that they eat (local, in-season, slowly and organic) or move (cycling and walking) leading to a changed relationship with the world around them in a manner that is innately pleasurable" (p. 16). If environmentally-friendly behavior is indeed pleasurable to do, engaging in such behavior will also increase hedonic well-being.

However, not all environmentally-friendly behaviors are perceived to be more pleasurable than their environmentally harmful counterparts, and some are even perceived to be less pleasurable. For instance, turning down the thermostat during a cold winter day can be considered environmentally-friendly behavior, but it may also lead to uncomfortably cold rooms[2]. In other words, not all environmentally-friendly behaviors are intrinsically satisfying or motivated by pleasant natural consequences (Bolderdijk, Lehman, & Geller, 2013). Instead, pleasure or displeasure is often derived from by-products of the environmentally-friendly behavior, such as "better taste" in the case of organic products, or "makes you feel cold" in the case of turning down the

2 Where the specific threshold between a comfortable and an uncomfortable temperature lies may depend on culture and personal experience.

heat. Without these advantages or disadvantages, the example behaviors would not be more or less pleasurable than their non-sustainable counterparts; environmentally-friendly behavior is thus not pleasurable per se.

Does this mean that we need to add pleasurable aspects to environmentally-friendly behaviors in order to increase hedonic well-being of those engaging in it? For example, should we make energy saving actions or recycling fun by incorporating it in a game[3]? Or should we make consuming in an environmentally-friendly way more comfortable by ensuring environmentally-friendly products are also of better quality? Although adding pleasurable or hedonic aspects to specific environmentally-friendly behaviors can increase the hedonic well-being derived from these behaviors, it may not be the most effective way to increase the well-being derived from environmentally-friendly behavior in general. Adding hedonic aspects to behavior only increases the hedonic well-being derived from that specific behavior, and not the hedonic well-being derived from other behaviors in the same category. Therefore, to increase the hedonic well-being derived from environmentally-friendly behavior in this way, one would have to add hedonic aspects to all separate environmentally-friendly behaviors. As argued above, we do not think that this is necessary to increase the well-being derived from environmentally-friendly behavior. First, environmentally-friendly behavior in general can already provide hedonic well-being because it brings people a step closer to reaching a sustainable goal. Second, as we will discuss in more depth in the next section, environmentally-friendly behavior can provide eudaimonic well-being because it is perceived as the 'right' course of action.

Environmentally-friendly behavior and eudaimonic well-being

In the section on consumption and hedonic well-being we argued that a more sustainable consumption pattern need not decrease hedonic well-being, since one can still reap the benefits of consumption in the form of environmentally-friendly alternatives, and one can replace "foregone" pleasurable experiences in the consumption domain by pleasurable experiences in other, more sustainable domains. Another often used argument for why a sustainable consumption pattern may even increase eudaimonic well-being, is that solely focusing on the pursuit of more consumer products detracts from well-being (Bauer, Wilkie, Kim, & Bodenhausen, 2012; Burroughs & Rindfleisch, 2002a; Csikszentmihalyi, 1999; Kasser, 2002; Richins, McKeage, & Najjar, 1992). People who focus on the pursuit of wealth and possessions typically invest less time and effort in the pursuit of intrinsic goals such as self-actualization or participation in social communities (Csikszentmihalyi, 1999; Kasser & Ryan, 1993), while it is the pursuit of these intrinsic goals that brings eudaimonic well-being. Therefore, it is often argued, there should be a positive relationship between

3 See for instance the website of "The fun theory", which shows examples of how "good" behavior is also made fun to do. Available online: http://www.thefuntheory.com/ (accessed on 10 December 2012).

environmentally-friendly behavior and eudaimonic well-being (T. Jackson, 2005; Kasser, 2009; Myers, 2003): shifting one's focus from the pursuit of materialistic things like money and products, to the pursuit of non-materialistic things like close relationships, personal growth and finding a sense of meaning in life is not only more environmentally-friendly, but it also contributes to eudaimonic well-being. As we will argue in the following section, environmentally-friendly behavior itself can even provide a source of meaning in life, thereby directly increasing eudaimonic well-being.

Doing good and well-being

As we mentioned in the beginning of this review, eudaimonic well-being is derived from "living well" or "pursuing the right ends" (Ryan et al., 2008). Engaging in virtuous activities is thus expected to foster eudaimonic well-being. One of the reasons why doing the right thing could foster eudaimonic well-being is that it has a signaling function to oneself: if you are taking the effort to engage in good behavior—even more so when doing this behavior is effortful and voluntary—you must be a good person. Indeed, people's self-worth is determined by how moral they perceive themselves to be (Dunning, 2007; Sachdeva, Iliev, & Medin, 2009). Well-being thus, amongst others, depends on perceiving one's actions as doing good instead of doing harm (Grant & Campbell, 2007).

This positive link between well-being and doing good can also be inferred from research on pro-social behavior. Spending money on others (Dunn, Aknin, & Norton, 2008) or charity (Andreoni, 1989; Andreoni, 1990; Harbaugh, Mayr, & Burghart, 2007; Liu & Aaker, 2008), volunteering (Meier & Stutzer, 2008; Steger, Kashdan, & Oishi, 2008; Wheeler, Gorey, & Greenblatt, 1998) or helping others (Weinstein & Ryan, 2010) are all examples of pro-social behavior that brings eudaimonic well-being. These studies show that engaging in pro-social behavior makes the doer feel good—even if the behavior does not have a direct benefit for him or herself. In fact, if people engage in pro-social or good behavior because of direct or indirect personal benefits such as monetary gain, social approval or job opportunities, its effect on eudaimonic well-being diminishes (Bolderdijk, Steg, Geller, Lehman, & Postmes, 2013; Krishna, 2011; Meier & Stutzer, 2008). Thus, doing the right thing particularly contributes to eudaimonic well-being when the choice for the right behavior is intrinsically and autonomously motivated—or at least perceived to be so (Ryan & Deci, 2000b; Ryan et al., 2008). Therefore, Evans and Jackson (D. Evans & Jackson, 2008) doubt whether the meaning that can be derived from pursuing a sustainable lifestyle will indeed be experienced by anyone who acts in an environmentally-friendly way; it is more likely that only those who deliberately choose for an environmentally-friendly lifestyle will gain eudaimonic well-being from their engagement.

Furthermore, in order to provide a sense of meaning and bring eudaimonic well-being, environmentally-friendly behavior should also be seen as doing the right thing by those who engage in it. Environmentally-friendly behavior has often been described as a form of pro-social behavior (De Young, 2000; Thøgersen, 1996; Turaga, Howarth, & Borsuk, 2010; Xiao & Li, 2011) that can be driven by altruistic motives (e.g., the concern for the next generation, other species, or whole eco-systems; Bamberg, Hunecke, & Blöbaum, 2007; Steg & De Groot, 2012; Stern, Dietz, & Kalof, 1993). It is also argued that environmentally-friendly behaviors are typically classified as moral behavior (Thøgersen, 1996), and that the choice for environmentally-friendly behavior is based, amongst others, on evaluations about what is the right or wrong thing to do (Lindenberg & Steg, 2007). In line with these theoretical claims, a national survey found that Americans strongly agreed that nature has intrinsic value and that humans have moral duties and obligations to animals, plants, and non-living nature such as rocks, water, and air (Leiserowitz, Kates, & Parris, 2005). Likewise, many people in the UK agreed that people have personal, social and moral responsibilities to address climate change (Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007).

Although this literature suggests that most people think behaving environmentally-friendly is the right thing to do, not everybody may agree—as a recent study for instance shows, conservatives usually are less likely to perceive environmentally-friendly behavior in terms of moral or good behavior (Feinberg & Willer, 2012). Whether one sees environmentally-friendly behavior as "good" behavior may depend on the norms and values upheld by the social groups one belongs to (Kahan, 2010). If environmentally-friendly behavior is frowned upon by those who are important to you, it is less likely that you will see environmentally-friendly behavior as good, and the other way around. However, an important factor for the extent to which you are likely to derive eudaimonic well-being from engagement in pro-environmental behavior is the extent to which you internalized these group values and norms (Ryan & Deci, 2000a; Thøgersen, 2006; Villacorta, Koestner, & Lekes, 2003). If your group members see environmentally-friendly behavior as highly important, but you yourself did not internalize these norms yet, the group norms may work as an external pressure. So if you engage in environmentally-friendly behavior because you believe your group values such behavior, and not because you yourself value it, it is less likely that you will derive eudaimonic well-being from your engagement; as mentioned above, Aristotle only classifies someone as having high eudaimonic well-being if this person is doing virtuous things for the right reasons—the right reasons being that the person is deliberately choosing to act virtuously and is not doing so out of external temptation or coercion, or out of ignorance (Ryan et al., 2008). So, if people do not value environmental protection or do not think environmentally-friendly behavior is the right thing to do, it is less likely that behaving in an environmentally-friendly way will

add to their eudaimonic well-being. Therefore, particularly for those people who see environmentally-friendly behavior as good, and for whom the choice for this behavior is intrinsically and autonomously motivated, behaving in an environmentally-friendly way is likely to bring eudaimonic well-being.

Summary

Our aim was to examine whether, when, and in what way environmentally-friendly behavior affects the well-being of those who engage in it. To fulfil this aim, we discussed the effect of environmentally-friendly behavior on hedonic (i.e., feeling pleasure) and eudaimonic (i.e., feeling meaningful) well-being, respectively. The research discussed so far suggests that engaging in environmentally-friendly behavior may have especially negative consequences for hedonic well-being, but mainly positive consequences for eudaimonic well-being. However, the full story is more complicated.

Environmentally-friendly behavior and hedonic well-being

As we discussed, environmentally-friendly behavior may decrease hedonic well-being for various reasons. Most importantly, protecting the environment may be unattainable, thereby making striving for this goal an onerous burden; living in an environmentally-friendly way can imply consuming less, thereby robbing people of the pleasure consumption can bring; and environmentally-friendly behavior can be experienced as less comfortable and convenient than its environmentally-unfriendly alternative. As we showed in this review, however, the role of these processes has to be nuanced.

Although uncertainty about the usefulness and effectiveness of one's environmentally-friendly behavior could in theory detract hedonic well-being, people may still experience a sense of progress towards an environmental goal when the goal is reframed into smaller sub goals. So although the pursuit of an unattainable goal may lead to decreased hedonic well-being, environmentally-friendly behavior does not have to be dedicated to an unattainable goal, and therefore does not have to decrease hedonic well-being.

With respect to the relationship between consumption and well-being, behaving in an environmentally-friendly way could imply that one has to miss out on some of the hedonic well-being that consumption brings. However, environmentally-friendly consumption and hedonic experiences in other, more sustainable, domains can replace the hedonic well-being that one "foregoes" by consuming in a more sustainable way. Cutting down or changing consumption out of environmentally-friendly considerations does therefore not necessarily have to lead to a decrease in hedonic well-being.

Lastly, environmentally-friendly actions can be less comfortable than their environmentally harmful counterparts, thereby leading to a decrease in hedonic well-being. On the other hand, however, there is also environmentally-friendly behavior that is seen as more pleasurable or comfortable than its environmentally harmful counterparts. It is therefore not environmentally-friendly behavior itself, but rather the by-products of environmentally-friendly behavior that bring pleasure or displeasure. Therefore, to explain why environmentally-friendly behavior itself would increase individual well-being—and not macro level well-being by increasing better environmental conditions—the focus should be on eudaimonic, instead of hedonic well-being.

Environmentally-friendly behavior and eudaimonic well-being

Although consumption may lead to an increase in hedonic well-being, solely focusing on the pursuit of more consumer products detracts from well-being, since people who focus on the pursuit of wealth and possessions typically invest less time and effort in the pursuit of more intrinsic goals such as self-actualization or participation in social communities. Therefore, shifting one's focus from the pursuit of materialistic things like money and products, to the pursuit of non-materialistic things like close relationships, personal growth and finding a sense of meaning in life is not only more environmentally-friendly, it may also contribute to eudaimonic well-being. Environmentally-friendly behavior itself can even be a source of meaning in life, thereby directly increasing eudaimonic well-being.

As defined in the current review, eudaimonic well-being can be found in "living well" or "pursuing the right ends" (Ryan et al., 2008), and environmentally-friendly behavior is seen by many as moral or good behavior (Leiserowitz et al., 2005). However, for environmentally-friendly behavior to lead to an increase in eudaimonic well-being, those who engage in it do have to see it as the right thing to do, and its engagement should be intrinsically and autonomously motivated. For those who do not see environmentally-friendly behavior as right, or for those who act in an environmentally-friendly way out of extrinsic reasons or ignorance, environmentally-friendly behavior is thus less likely to add to eudaimonic well-being.

Conclusion

Environmentally-friendly behavior in itself does not have to result in a decrease of personal well-being. As we showed in this literature review, processes through which environmentally-friendly behavior is expected to have a detrimental influence on (hedonic) well-being can be nuanced; environmentally-friendly behavior probably does not have the daunting influence on hedonic well-being it is often depicted to have. However, this does not warrant that environmentally-friendly behavior will thus have a positive influence on well-being. The discussed literature suggests that for environmentally-friendly behavior to lead to an increase in (eudaimonic) well-being, it is important that people see this type of behavior as the right thing to do, and have the feeling they want and freely choose to perform this behavior.

For policies that are aimed at increasing environmentally-friendly behavior and well-being, achieving this might be a hard nut to crack. However, this review does offer some general guidelines for how policy makers can increase the likelihood of a positive relation between environmentally-friendly behavior and well-being. In line with Moller, Ryan and Deci (2006), this review suggests that "forcing" people to act in an environmentally-friendly way by making it obligatory by law may be counterproductive if the aim of policies in the end is to increase well-being. For environmentally-friendly behavior to increase well-being, it is important to convince people that their behavior is right and meaningful, and stimulate people to choose this behavior of their own free will (Moller et al., 2006; Ryan & Deci, 2000b). Future research is therefore needed to examine how intrinsic and autonomous motivation for environmentally-friendly behavior can best be generated, also for those who do not strongly value environmental protection at the moment, in order to form a positive link between environmentally-friendly behavior and (eudaimonic) well-being.

Chapter 3

Do people associate environmentally-friendly behavior with positive emotions?

Abstract

Environmentally-friendly behavior is sometimes seen as a sacrifice associated with negative emotions, as engagement in this behavior can be relatively uncomfortable. We argue this view is too narrow, as it overlooks that environmentally-friendly behavior can also be seen as virtuous, thereby providing meaning. In the current studies we show people seem to have a stronger positive association with environmentally-friendly behavior than with environmentally-unfriendly behavior (Study 1), and they implicitly associate environmentally-friendly behavior more strongly with positive than with negative emotions (Study 2). Furthermore we found that this positive association was stronger when the behavior is perceived as more virtuous and when engagement can be attributed to one's own volition (Study 1). Together these results suggest that meaning may play an important role in the emotional association people have with environmentally-friendly behavior.

This chapter is based on Venhoeven, L. A., Bolderdijk, J. W., Steg, L., & Keizer, K. (Invited to Resubmit). Do people associate environmentally-friendly behavior with positive emotions? *Nature Energy*.

Introduction

The transition to a sustainable society is an important goal in the upcoming years. Besides political action and technological development, individual behavior changes are indispensable in this transition (IPCC, 2014), as they are an important driver behind environmental change (DuNann Winter & Koger, 2004; Gardner & Stern, 2002; Gifford, Kormos, & McIntyre, 2011; Hackmann, Moser, & St. Clair, 2014; Vlek & Steg, 2007; Weaver et al., 2014). An important question to answer, therefore, is what motivates people to engage in environmentally-friendly behavior.

Research shows that emotions play an important role in decision making (Loewenstein & Lerner, 2003; Pfister & Böhm, 2008; Schwarz, 2000; Zeelenberg, Nelissen, Breugelmans, & Pieters, 2008) and can influence engagement in environmentally-friendly behavior (Smith, Haugtvedt, & Petty, 1994). What kind of emotions people associate with environmentally-friendly behavior and what causes this association, therefore, are points of interest. As illustrated by the quote "The American way of life is not up for negotiations" by former U.S. president George H.W. Bush prior to the Earth Summit in Rio de Janeiro, it seems that environmentally-friendly behavior is sometimes perceived as a sacrifice that decreases quality of life; i.e. is associated with negative emotions.

We however argue viewing environmentally-friendly behavior as a sacrifice overlooks its positive *eudaimonic* aspects: environmentally-friendly behavior can be perceived as virtuous and thus as meaningful behavior. At the heart of this idea is Aristotle, who taught that well-being can be found in the expression of virtue or doing the right thing for the right reasons, e.g. out of your own volition (Ryan et al., 2008). Research shows that having pleasant experiences is indeed not the only route to positive emotions (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Ryan & Deci, 2000a; Sheldon, Elliot, Kim, & Kasser, 2001), having meaningful experiences can feel good as well (Peterson, Park, & Seligman, 2005). It may thus be these eudaimonic aspects that lead to a positive association with environmentally-friendly behavior.

Indeed, engagement in behavior that is personally perceived to be valuable or important can elicit positive emotions (Ryan & Connell, 1989; Ryan & Deci, 2000a; Sheldon, Kasser, Smith, & Share, 2002). Furthermore, engagement in moral or prosocial behavior, i.e. behaviors that are generally seen as valuable or important, in itself can feel good (Aknin et al., 2012; Andreoni, 1989; Andreoni, 1990; Batson & Powell, 2003; Dunn et al., 2008; Grant & Sonnentag, 2010). Environmentally-friendly behavior fits these categories as well: contributing to the environment has been classified as a manifestation of moral behavior (Feinberg & Willer, 2012; Howell, 2013; Pandey, Rupp, & Thornton, 2013; Thøgersen, 1996). For example, Americans strongly agreed

that nature has intrinsic value and that humans have moral duties and obligations to animals, plants, and non-living nature such as rocks, water, and air (Leiserowitz et al., 2005). Likewise, many people in the UK agreed that people have personal, social and moral responsibilities to address climate change (Lorenzoni et al., 2007). The choice for acting environmentally-friendly is therefore partly based on evaluations about what the right or wrong thing to do is (Lindenberg & Steg, 2007). Given that many consider protecting the environment a virtue, we expect that engaging in environmentally-friendly behavior will be associated with positive emotions, which in turn may promote acting this way.

The current paper

In this study we first examine what kind of emotional association people have with environmentally-friendly behavior (Study 1 and Study 2). Second, we expect that if a positive emotional association is found, this association follows from environmentally-friendly behavior being meaningful. Therefore, we expect the strength of this association to depend on how meaningful the behavior is perceived to be. In the current paper, we study four different indicators of meaning. We expect that a positive emotional association with environmentally-friendly behavior is strengthened when the behavior is personally perceived as more virtuous, as indicated by the extent to which people *value the environment* (Study 1 and Study 2) and the extent to which people *feel morally obliged* to engage in environmentally-friendly behavior (Study 1). Furthermore, we expect that a positive emotional association with environmentally-friendly behavior is strengthened when the behavior itself is perceived as more virtuous, as indicated by the extent to which behavior is *perceived to be environmentally-friendly* (Study 1). Moreover, we expect that a positive emotional association with environmentally-friendly behavior is strengthened when engagement reflects more strongly on who you are, as indicated by the extent to which *the choice for the behavior is volitional* (Study 1). Lastly, we examine whether a more positive association with environmentally-friendly behavior is in turn related to stronger intentions to engage in this behavior (Study 1).

Results

We conducted two studies to examine people's emotional association with environmentally-friendliness, testing how people thought they would feel after engaging in environmentally-friendly versus environmentally-unfriendly behavior (Study 1) as well as implicit associations between environmentally-friendliness and emotions to control for social desirability answering (Study 2).

In Study 1, we asked a general sample of inhabitants of a Dutch city (N = 132) to report how they would feel after engaging in several types of environmentally relevant behavior. For our manipulation, participants were randomly assigned to one of two conditions: half of the participants evaluated five behaviors that were environmentally-friendly (e.g., washing clothes at a low temperature), while the other half evaluated five versions of the same behaviors that were environmentally-unfriendly (e.g., washing clothes at a high temperature; further referred to as environmentally-unfriendly behavior). For each behavior, participants imagined engaging in the behavior out of their own volition (e.g., washing clothes at a low temperature) as well as out of situational constraints (e.g., washing clothes at a low temperature *when it is the only available option on the machine*), presented consecutively. Hence, all participants evaluated ten behaviors in total.

As our dependent measure, participants indicated on a five-point scale (1 = *not at all*, 3 = *neutral*, 5 = *very strongly*) to what extent they expected to experience six emotions after engagement in each of the ten behaviors: proud, satisfied and cheerful (averaged to represent positive emotions; α's for the ten behaviors ranged from .87 to .93; $\alpha_{over\_all\_behaviors}$ = .97), and disappointed, frustrated and guilty (averaged to represent negative emotions; α's for the ten behaviors ranged from .87 to .94; $\alpha_{over\_all\_behaviors}$ = .97). Furthermore, all participants indicated to what extent they intended engaging in the environmentally-friendly version of each of the five voluntary behaviors (1 = *not at all* to 5 = *very strongly*, $\alpha_{over\_all\_behaviors}$ = .76).

As indicators of meaning, our moderator variable, all participants completed a questionnaire on values (Steg, Perlaviciute, Van der Werff, & Lurvink, 2014), including a biospheric value scale (-1 = *opposed to my principles*, 0 = *not important*, to 7 = *extremely important*; α = .88; centered prior to the analysis) and indicated to what extent they thought these five behaviors were environmentally-friendly (1 = *not at all* to 5 = *very strongly*, $\alpha_{over\_all\_behaviors}$ = .78; centered prior to the analysis) and to what extent they felt morally obliged to engage in these five behaviors (1 = *not at all* to 5 = *very strongly*, $\alpha_{over\_all\_behaviors}$ = .81; centered prior to the analysis).

We first examined what kind of emotional association people have with environmentally-friendly behavior. Multiple analysis of variance suggests that participants who imagined engaging in the environmentally-friendly version of the behaviors anticipated feeling more positive emotions (M_{pos} = 2.99, SD_{pos} = .80) and less negative emotions (M_{neg} = 1.48, SD_{neg} = .45) than participants who imagined engaging in the environmentally-unfriendly version of those same behaviors (M_{pos} = 1.85, SD_{pos} = .68; M_{neg} = 2.50, SD_{neg} = .81; $F_{pos}(1,121) = 72.29$, $p_{pos} < .001$, $\eta p^2_{pos} = .37$; $F_{neg}(1, 121) = 74.09$, $p_{neg} < .001$, $\eta p^2_{neg} = .38$). When we looked at the emotions separately, we found no consistent differences for emotions that could be categorized as hedonic or eudaimonic: the same pattern of results was found for all emotions. These results are a first indication that people have a an overall positive association with environmentally-friendly behavior.

As expected, regression analyses show that a positive association with environmentally-friendly behavior was more pronounced for people with stronger biospheric values ($B_{behaviortype\ x\ values} = .34$, $t(119) = 3.71$, $p < .001$). The same holds for people who felt more morally obliged to engage in environmentally-friendly behavior ($B_{behaviortype\ x\ obligation} = .44$, $t(119) = 3.00$, $p < .01$) and for people who saw the behaviors as more environmentally-friendly ($B_{behaviortype\ x\ environmentally\ friendliness} = .61$, $t(119) = 3.05$, $p < .01$; all tested in separate models). Furthermore, mixed model analysis of variance showed emotional associations were more positive for voluntary behaviors than for behaviors driven by situational constraints ($F(1, 121) = 31.92$, $p < .001$, $\eta p^2 = .21$; see Figure 1). For negative emotions similar patterns of results occurred, although only the interactions between behaviortype and moral obligation ($B = -.37$, $t(119) = -2.89$, $p < .01$) and behaviortype and volition ($F(1,121) = 26.71$, $p < .001$) reached significance. These results suggest that the positive association that people have with environmentally-friendly actions is stronger when people see the behaviors as more virtuous, and when engaging in the behavior can be attributed to one's own volition. This suggests that meaning indeed plays an important role in the emotional association people have with environmentally-friendly behavior.

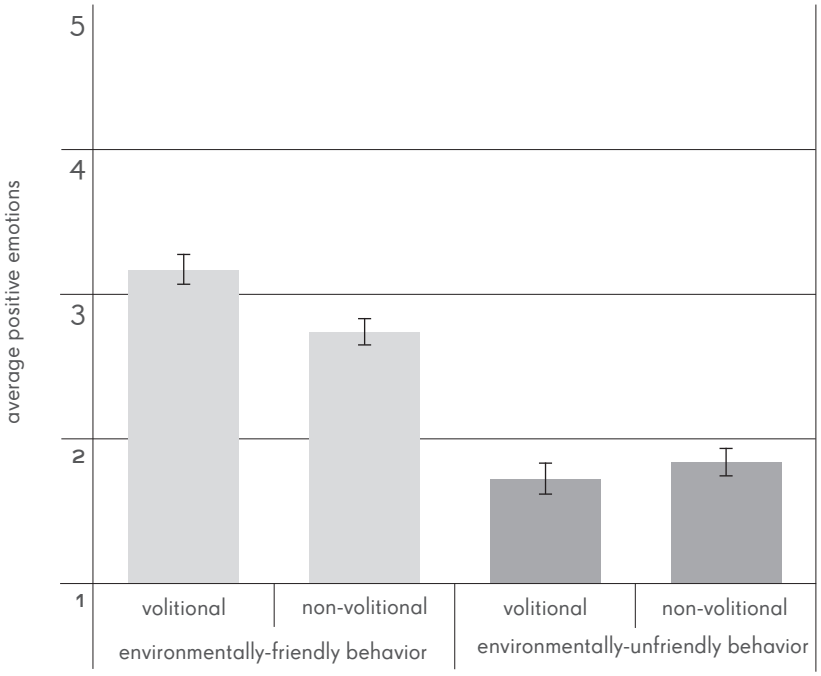


Figure 1. Anticipated positive emotions after engagement in volitional and non-volitional environmentally-friendly versus environmentally-unfriendly behavior.

Lastly, linear regression analysis was used to test the effect of anticipated positive and negative emotions (centered prior to the analysis) on people's intentions to engage in environmentally-friendly behavior. The interactions between condition (environmentally-friendly versus environmentally-unfriendly behavior) and the strength of the anticipated positive and negative emotions over all behaviors (included in the same model) were significant: the less negative and the more positive people expected to feel about the environmentally-friendly version of the behavior, the stronger their intention to engage in this type of behavior ($B_{behaviortype\ x\ negative}$ = -.68, $t(117)$ = -3.10, $p < .01$; $B_{behaviortype\ x\ positive}$ = .73, $t(117)$ = 4.30, $p < .001$).

The results of Study 1 suggest that people have a positive emotional association with environmentally-friendly behavior, particularly when such behavior provides meaning. Furthermore, this positive association in turn seems to strengthen intentions to engage in environmentally-friendly behavior. However, as we contrasted environmentally-friendly behavior with environmentally-unfriendly behaviors, the question remains whether people indeed have a positive emotional association with environmentally-friendly behavior, or whether they mainly have a negative emotional association with environmentally-unfriendly behavior. Furthermore, as people are motivated to be seen as moral (Batson, Thompson, Seuferling, Whitney, & Strongman, 1999) we cannot exclude that these results, which are based on explicit answers, are caused by social desirability concerns. To rule out these alternative explanations,

we examined the association between environmentally-friendly behavior and positive emotions in an implicit way in Study 2, comparing this association to a neutral control condition.

First year psychology students of a Dutch university (N = 76) took part in a laboratory experiment in exchange for course credits. All participants first completed a questionnaire that included the biospheric value scale (Steg et al., 2014; $\alpha = .90$). Next, participants took a computerized Implicit Association Test (IAT; for full procedure see Greenwald et al., 1998; Greenwald, Nosek, & Banaji, 2003). The IAT aims to measure people's automatic evaluation of a concept (Greenwald et al., 1998) – in the present paper the emotional association with environmentally-friendliness. The reasoning is that if people have a positive emotional association with environmentally-friendliness, categorizing environmentally-friendly words with the same key as positive emotions (considered to be congruent blocks) should be cognitively easier, and thus faster, than categorizing environmentally-friendly words with the same key as negative emotions (considered to be incongruent blocks; see Figure 2). A positive difference between participants' reaction time in the congruent and incongruent blocks therefore suggests a positive association with environmentally-friendliness.

Repeated measures ANOVA showed that reaction times were indeed lower for the congruent than for the incongruent blocks: when environmentally-friendly and positive words were categorized with the same key, participants responded faster (M = 795.24 ms) than when environmentally-friendly and negative words were categorized with the same key (M = 902.82 ms; $F(1,75) = 11.86$, $p < .01$, $\eta p^2 = .14$; IAT effect = 107.58 ms; IAT D = .24). We did not find that a positive association with environmentally-friendliness was more pronounced for people with stronger biospheric values in this study.

These results indicate an implicit association between environmentally-friendliness and positive emotions, showing that our sample overall had a positive association with environmentally-friendliness. As we studied these emotional associations in an implicit way, it is unlikely that the found positive association exclusively stems from social desirability answering. In sum, these results again suggest a positive association with environmentally-friendly behaviors exists.

Discussion

The two studies described in this paper show that environmentally-friendly behavior is not as negatively viewed as may sometimes be believed. In contrast, people seem to have a stronger positive association with environmentally-friendly behavior than with environmentally-unfriendly behavior (Study 1), and they implicitly associate environmentally-friendliness more strongly with positive than with negative emotions (Study 2). Furthermore, as expected, we found that this positive emotional association was stronger when the behavior is perceived as more virtuous, that is, for people who more strongly endorse biospheric values (Study 1, but not Study 2), who feel stronger moral obligation to engage in environmentally-friendly behavior (Study 1), and who perceive the behaviors to be more environmentally-friendly (Study 1). Also, the positive emotional association was stronger when engagement reflects more strongly on who you are, that is, when the choice for the behavior was volitional (Study 1). Together these results suggest that meaning may play an important role in the emotional association people have with environmentally-friendly behavior. In turn, this positive association seems to affect intentions to engage in environmentally-friendly behavior (Study 1).

Although the current paper suggests people have a positive association with environmentally-friendly behavior, it does not exclude that such behavior may be seen as mainly a sacrifice by some people (e.g. climate-change deniers) or under some circumstances. An interesting question for future research therefore is what happens when the conflict between comfort and meaning aspects may be greater than in the current studies. While successful engagement in for instance high-impact but high-cost behaviors may be perceived as more fulfilling and meaningful, engagement may be perceived as a larger sacrifice as well. Future research is needed to study when and for whom the anticipated discomfort during engagement may no longer be outweighed by the meaning successful engagement is expected to bring, thereby discouraging people to engage in the behavior altogether.

Another interesting question for future research is whether there are ways to increase the meaning of environmentally-friendly behavior in general instead of increasing the meaning of specific environmentally-friendly behavior one by one. If meaning is indeed an important source for the positive emotions associated with engagement in environmentally-friendly behavior, which in turn may encourage engagement in this type of behavior, finding ways to increase the behaviors' perceived meaning could be a fruitful way to increase people's positive emotional association with and engagement in environmentally-friendly behavior. Our results suggest that strengthening biospheric values or the extent to which the behavior is seen as a moral cause may be routes to increase the extent to which environmentally-friendly behavior is generally

seen as meaningful. In contrast, the extent to which particular behavior is perceived as environmentally-friendly or autonomously chosen may increase the meaning of specific behaviors only. Future research could focus on studying the distinction between general and specific meaning aspects of environmentally-friendly behavior, and its consequences for spill-over to engagement in a broad range of environmentally-friendly behaviors in more detail.

We found that a positive emotional association increases intentions to behave in environmentally-friendly ways. This suggests that external incentives may not always be necessary to encourage people to act green; the positive emotions that result from engagement in meaningful behavior may be intrinsically motivating to act green as well (Taufik, Bolderdijk, & Steg, 2015; van der Linden, 2015). This suggests that the possible discomfort aspects of environmentally-friendly behavior should be put in perspective. Since environmentally-friendly behavior is not solely seen as a sacrifice associated with losses in comfort or convenience, decreasing or downplaying these aspects should not be the sole focus of campaigns to promote environmentally-friendly behavior (L. Evans et al., 2013; Thøgersen, 2013). As people evaluate environmentally-friendly behavior positively, highlighting its positive meaning aspects might provide a fruitful way to promote engagement in this behavior.

Materials and Methods

Ethics Statement

The Ethical Committee Psychology of the University of Groningen approved both Study 1 (approval number ppo-011-099) and Study 2 (approval number 11055-N). Informed consent was obtained from all participants in Study 1 and Study 2.

Study 1

Study 1 followed a mixed design, with environmentally-friendly versus environmentally-unfriendly behaviors as a between-subjects factor, and autonomous versus non-autonomous behaviors as a within-subjects factor. Additionally, we measured individual differences in biospheric values, feelings of moral obligation to engage in the behaviors and perceived environmentally-friendliness of the behaviors.

Participants (N = 132; 60 female, 65 male, 7 unknown; $Median_{age}$ = 30.5 years) completed a questionnaire that was distributed door-to-door in diverse neighborhoods in a city in the Netherlands, and recollected after approximately half an hour. The data of 9 participants were not included in the analysis because they had missing values on at least one of the dependent or independent variables.

For our manipulation, participants were randomly assigned to one of two conditions: half of the participants indicated how they would feel after engagement in five behaviors that could benefit the environment (further referred to as *environmentally-friendly* behavior), while the other half evaluated five versions of the same behaviors that could harm the environment (further referred to as *environmentally-unfriendly* behavior). These five behaviors were respectively: turning the light off in an empty room (leaving the light on in an empty room); buying organic products in the cafeteria (buying non-organic products in the cafeteria); separating waste at work (throwing all types of trash in the same bin at work); using the bike for short distances (using the car for short distances) and washing clothes at a low temperature (washing clothes at a high temperature). For each of these behaviors, participants were first asked to imagine engaging in the behavior out of their own volition (e.g., washing clothes at a low temperature) and next to imagine engaging in the behavior because of situational constraints (e.g., washing clothes at a low temperature *when it is the only available option on the machine*). Hence, in total participants evaluated either 10 environmentally-friendly versions, or 10 environmentally-unfriendly versions of behavior.

As our dependent measure, participants indicated on a five-point scale (1 = *not at all*, 3 = *neutral*, 5 = *very strongly*) to what extent they expected to experience the following six emotions after engagement in each of the 10 behaviors: proud, satisfied and cheerful (averaged to represent positive emotions; α's for the ten behaviors ranged from .87 to .93; $\alpha_{overall}$ = .97), and disappointed, frustrated and guilty (averaged to represent negative emotions; α's for the ten behaviors ranged from .87 to .94; $\alpha_{overall}$ = .97). These emotions were chosen as they represent eudaimonic (proud, guilty) as well as hedonic (satisfied, cheerful, disappointed, frustrated) emotions. Furthermore, all participants indicated to what extent they intended engaging in the environmentally-friendly version of each of the five voluntary behaviors (1 = *not at all* to 5 = *very strongly*; M = 3.96, SD = .74, α = .76).

As indicators of personal meaning attached to environmentally-friendly behavior, participants completed a value scale including four biospheric value items (respecting the earth, unity with nature, protecting the environment and preventing pollution; Steg et al., 2014). The importance of biospheric values were rated on a 9-point scale ranging from -1 = *opposed to my principles*, 0 = *not important*, to 7 = *extremely important* (M = 4.18, SD = 1.47; biospheric values were centered prior to the analysis). For half of the participants the value scale was included before people rated anticipated emotions about engagement in the behaviors, and for the other half the value scale was included after these behavior evaluations. This order did not affect any of our results. Furthermore, all participants indicated to what extent they felt morally obliged to engage in the environmentally-friendly version of each of the five

autonomous behaviors (1 = *not at all* to 5 = *very strongly*; M = 3.49, SD = .90, α = .81; moral obligation was centered prior to the analysis).

As indicator of the extent to which the behavior itself was perceived to be virtuous, participants indicated to what extent they thought these five behaviors were environmentally-friendly (1 = *not at all* to 5 = *very strongly*; M = 4.23, SD = .65, α = .78; environmentally-friendliness of behavior was centered prior to the analysis).

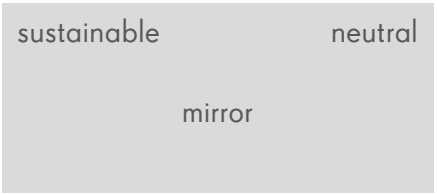
Study 2

First year psychology students (N = 76; 67 female, 9 male; $Median_{age}$ = 19.0 years) took part in a laboratory experiment in exchange for course credits. All participants first completed a questionnaire that, besides the same value scale used in Study 1 (Steg et al., 2014; $M_{biospheric}$ = 3.60, $SD_{biospheric}$ = 1.46), included a measure of regulatory focus (Hamstra, Bolderdijk, & Veldstra, 2011; Van Stekelenburg, 2006) and two questions on meat consumption ("How many days a week on average do you eat meat with your main dish?" and "How many grams meat do you on average eat with your main dish, when it contains meat?"). Results on these last two constructs are not reported here, as they are not relevant for the goal of the current paper.

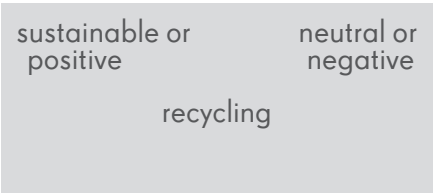
After completing the questionnaire, participants took part in a computerized Implicit Association Test (IAT; Greenwald et al., 1998). The IAT measures people's automatic emotional association with a concept (Greenwald et al., 1998) – in the present paper with environmentally-friendliness. The assumption made in an IAT is that if people have a positive association with environmentally-friendliness, categorizing environmentally-friendly words with the same key as positive emotions (which we consider to be congruent blocks; see example Block 3 in Figure 2) should be easier, and thus faster, than categorizing environmentally-friendly words with the same key as negative emotions (which we consider to be incongruent blocks; see example Block 5 in Figure 2).

In order to compare response times in the congruent and incongruent blocks, environmentally-friendliness had to be contrasted to another category. Typically the opposite category, which would in this case be environmentally-unfriendliness, is chosen for this purpose. However, as one of the goals of the current study was to test whether a positive association with environmentally-friendliness, and not only a negative association with environmentally-unfriendliness exists, we contrasted environmentally-friendly to neutral words. This procedure still allows comparison with a contrasting category, while making it possible to test specifically whether people have a positive association with environmentally-friendliness (Nosek, Greenwald, & Banaji, 2007).

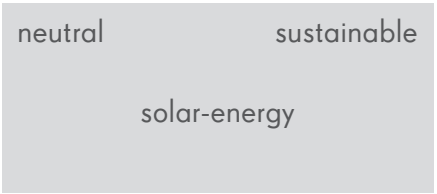
Figure 2.
Example choices from the IAT



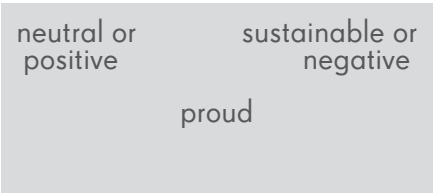
Example Block 2. The correct response here is to press the "M" key to place the word "Mirror" in the category "Neutral".



Example Block 3: Congruent block. The correct response here is to press the "Z" key to place the word "Recycling" in the category "Sustainable or Positive".



Example Block 4. The correct response here is to press the "M" key to place the word "Solar-energy" in the category "Sustainable".



Example Block 5: Incongruent block. The correct response here is to press the "Z" key to place the word "Proud" in the category "Neutral or Positive".

A pilot test was conducted to choose the words to be categorized under the labels "sustainable" and the contrast category "neutral", respectively. In the pilot participants indicated to what extent they associated the included words with the label "sustainable" and to what extent they associated them with positive and negative emotions. Words that were strongly associated with the label sustainable were selected for the "sustainable" category. As Table 1 shows, the words included in this category reflect environmentally-friendly words. Words that were not associated with the label sustainable, nor with positive or negative emotions were selected for the "neutral" category.

Participants completed seven blocks, each consisting of 20 Trials, in which they had to place the words shown in Table 1 in the correct category, as illustrated in Figure 2. Words could be placed in the category that appeared on the left by pressing the "Z" key on the keyboard, or be placed in the category on the right by pressing the "M" key on the keyboard. The categories used in the different blocks were the following:

- Block 1: Positive—Negative
- Block 2: Sustainable—Neutral
- Block 3: Sustainable/Positive—Neutral/Negative
- Block 4: Sustainable/Positive—Neutral/Negative
- Block 5: Neutral—Sustainable
- Block 6: Neutral/Positive—Sustainable/Negative
- Block 7: Neutral/Positive—Sustainable/Negative

Table 1.
Categories and Words Used in the IAT

Positive	Negative	Sustainable	Neutral
Plezier *(Fun)*	Ongelukkig *(Unhappy)*	Zonne-energie *(Solar-power)*	Spiegel *(Mirror)*
Voldaan *(Fulfilled)*	Schaamte *(Shame)*	Energiebesparing *(Energy saving)*	Gestreept *(Striped)*
Prettig *(Contented)*	Naar *(Miserable)*	Milieubewust *(Environmentally concious)*	Alfabetisch *(Alphabetical)*
Trots *(Proud)*	Ontevreden *(Dissatisfied)*	Hergebruik *(Reuse)*	Elastisch *(Elastic)*
Gelukkig *(Happy)*	Schuldig *(Guilty)*	Recycling *(Recycling)*	Figuurlijk *(Figurative)*

The IAT was conducted in Dutch. English translations of the used words are included in brackets.

The words were presented in randomized order within each of the seven blocks and the order of the blocks was counterbalanced between participants: all participants started with Block 1, after which half of the participants were first presented with the congruent blocks (Block 2, 3 and 4; Sustainable/Positive) while the other half of the participants were first presented with the incongruent blocks (Block 5, 6 and 7; Sustainable/Negative).

The emotional association people have with environmentally-friendliness was tested by comparing the average reaction time in Block 3 and 4 – where "sustainable" and "positive", and "neutral" and "negative" were categorized with the same key – with the average reaction time in Block 6 and Block 7 – where "sustainable" and "negative", and "neutral" and "positive" were categorized with the same key.

Acknowledgements

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chapter 4

Why acting environmentally-friendly feels good

Exploring the role of meaning

Abstract

Research shows acting environmentally-friendly and experiencing well-being can be related. Why this relationship exists, however, remains unclear. In the current paper we propose that engaging in environmentally-friendly behavior may give people a sense of meaning, as acting this way can be seen as a form of virtuous behavior. More specifically, we argue that the more environmentally-friendly behavior is perceived to be, the more meaningful this behavior may become. The meaning associated with this behavior may in turn explain why acting environmentally-friendly feels good. In three studies we indeed found that perceiving you are *personally* making a positive environmental contribution by doing the *behavior* (Study 1) and perceiving your behavior to be environmentally-friendly (Study 2 and 3) increases the meaning associated with this behavior. In turn, the meaning associated with the behavior improves how people expect to feel (Study 1 and 2) and actually feel (Study 3) about acting environmentally-friendly. Together these results suggest that the meaning associated with environmentally-friendly behavior can serve as an important explanation for why people feel good about acting this way.

This chapter is based on Venhoeven, L. A., Bolderdijk, J. W., Steg, L., & Sheldon, K.M. (Manuscript in preparation for submission). Why acting environmentally-friendly feels good: exploring the role of meaning.

Introduction

Preserving and improving environmental quality is an important goal in the upcoming years. One of the agreements made at the Paris climate conference (COP21), for instance, is the aim to keep the temperature rise under 1.5 degrees of the temperature before the industrial revolution (European Commission, December 23, 2015). To be able to reach this aim, technological and policy changes will not be enough; individuals need to change their behavior as well (Chiras, 2011; IPCC (Intergovernmental Panel on Climate Change), 2007). While individual behavior change may benefit the environment, this change is oftentimes assumed to involve a sacrifice (De Young, 1990-1991): people may have to give up on things they like, thereby foregoing well-being. In the current paper we challenge the idea that acting environmentally-friendly is at odds with individual well-being. In fact, we argue that environmentally-friendly action may even be a source of well-being.

Correlational research shows that acting environmentally-friendly and well-being are indeed related (Brown & Kasser, 2005; Kasser & Sheldon, 2002; Xiao & Li, 2011). Consuming in an environmentally-friendly way, for instance, has been linked to greater personal well-being (Brown & Kasser, 2005), higher overall life-satisfaction (Xiao & Li, 2011), and increased happiness (Kasser & Sheldon, 2002). Typically, the explanations for the link between environmentally-friendly behavior and well-being do not focus on characteristics of environmentally-friendly behavior itself, but rather point to factors external to the behavior (Brown & Kasser, 2005; T. Jackson, 2005; Kasser & Sheldon, 2002). For example, personality characteristics such as being mindful may both make people act environmentally-friendly and also lead to higher well-being (Brown & Kasser, 2005). Additionally, it has been suggested that those things that actually make people happy, like personal growth and social relationships, 'happen to be' environmentally-friendly as well (T. Jackson, 2005; Kasser & Sheldon, 2002). In the current paper, we question the notion that the link between environmentally-friendly actions and well-being can exclusively be explained by factors external to this behavior. Instead, we argue there is something specific about environmentally-friendly behavior *itself* that makes people feel good about acting this way.

Some environmentally-friendly behaviors, such as cycling on a nice spring day, may feel good since they are comfortable or pleasurable to engage in. However, this is not necessarily true for all environmentally-friendly behavior. In fact, many of these behaviors are somewhat unpleasant, which may lead people to assume that acting environmentally-friendly equates sacrificing well-being. We however argue viewing environmentally-friendly behavior as a sacrifice overlooks its positive *eudaimonic* aspects: as acting environmentally-friendly can have positive consequences for the environment and for the well-being of others now and in the future, it can be seen as

a form of virtuous and thus meaningful behavior (Heberlein, 1972; Leopold, 1949; Thøgersen, 1996). Engaging in meaningful behavior, in turn, has been found to make the doer feel good as well (Aknin, Dunn, Whillans, Grant, & Norton, 2013; Andreoni, 1989; Andreoni, 1990). We therefore suggest there is something specific about the nature of environmentally-friendly behavior *itself* that elicits a good feeling: acting environmentally-friendly may be perceived as meaningful, and thereby make people who engage in this behavior feel good.

The current paper

Following the reasoning above, we predict that people perceive their actions to be more meaningful when they see them as more environmentally-friendly, which in turn elicits a good feeling about engaging in this type of behavior. Specifically, we expect that meaning will mediate the relationship between environmentally-friendly behavior and positive emotions. On the basis of this reasoning, we expect that people will attribute more meaning to behavior when they perceive it to be more environmentally-friendly. When operationalizing perceived environmentally-friendliness, we consider both the extent to which people feel they can personally contribute to a better environment by engaging in specific behavior (Study 1) as well as the extent to which they perceive their behavior contributes to a better environment (Study 2 and 3). By making this distinction, we can test whether not only one's *personal* contribution to a better environment, but also more generally perceiving one's *behavior* can contribute to a better environment, brings a sense of meaning.

Following our reasoning above, we expect that it is especially positive *virtuous* characteristics of behavior, such as the notion that engaging in this behavior has positive consequences for the environment, that make people perceive this behavior to be meaningful. Relative to other positive but less virtuous characteristics of behavior (e.g. whether the behavior saves money), virtuous characteristics should thus have a particularly strong effect on perceived meaning. Furthermore, we expect that the meaning associated with this behavior will in turn elicit positive emotions about acting environmentally-friendly. Lastly, we expect that people will feel more positive emotions about engaging in behavior they perceive to be more environmentally-friendly. We conducted three studies to test our reasoning.

Study 1

Method

Participants (N = 128; 81 female, 47 male; M_{age} = 39.55 years, SD = 11.97) completed an online questionnaire via Mturk and were paid $1.50 for their participation. In total 25 participants were excluded from the analyses because they did not follow the instructions or failed to provide the correct answer to a question designed to measure whether they were paying attention while completing the questionnaire.

The questionnaire started with a scenario: participants were asked to imagine a recycling facility would open in their community. Half of the participants were asked to mention a maximum of four ways *how* they would alter their household routine to sort their garbage, while the other half were asked to mention a maximum of four reasons *why* they would alter their household routine to sort their garbage (see Appendix I for full text). As the how/why manipulation did not affect any of the key variables in this study, the data were collapsed across conditions for the analyses.

Participants first indicated to what extent starting to recycle would elicit each of six emotions on a 5-point scale (1 = *not at all*, 3 = *moderately*, 5 = *very strongly*): good, satisfied, proud (averaged to represent positive emotions, our dependent variable; α = .88, M = 4.11, SD = .94), and as filler items: annoyed, bad and irritated. Next, we included two measures of the meaning participants associated with starting to recycle. As a first measure of meaning, participants indicated to what extent they agreed that starting to recycle would "be meaningless" (R), "be valuable", "have no clear purpose" (R), "be important" and "be the right thing to do" (scale averaged to represent meaning, our mediating variable; α = .85, M = 4.50, SD = .67; 1 = *not at all*, 3 = *moderately*, 5 = *very strongly*). As a second measure of meaning we used an items of the Perceived Locus of Causality scale (PLOC; Osbaldiston & Sheldon, 2003): "starting to recycle is something I would personally value doing or think is meaningful to do" (1 = *not at all*, 3 = *moderately*, 5 = *very much*). Results on the remaining PLOC items are not reported here, as they are not relevant for the goal of the current paper.

To measure to what extent recycling is perceived to be environmentally-friendly we asked participants to indicate their agreement with the following items: "I could contribute to decreasing environmental problems by starting to recycle", "I could contribute to a better environment by starting to recycle" and "The quality of the environment would improve if I start to recycle" (our independent variable; α = .93, M = 4.21, SD = .97; 1 = *strongly disagree*, 5 = *strongly agree*)[1].

1 Furthermore, we included some additional items that are not relevant for the goal of the current paper (see Appendix II). Results on these items are not reported here.

Results

To test to what extent perceiving one's behavior to be environmentally-friendly feels good because of the meaning associated with this behavior, we conducted a mediation analysis using bootstrapping ($N = 1000$; (Preacher & Hayes, 2004). For both measures of meaning we found that the indirect effect of perceived environmentally-friendliness on positive emotions through meaning was significant ($ab_{meaning\_ploc}$ = .31, 95% CI [.18, .52]; $ab_{meaning\_scale}$ = .47, 95% CI [.27, .73]; see Table 1 and 2). In other words, regardless of what measure of meaning we use, the results imply that people feel good about personally contributing to a better environment by recycling because doing so can be perceived as meaningful.

To further examine the relationship between perceived environmentally-friendliness and positive emotions, we examined the separate steps of this mediation model. Regression analysis showed that the more strongly people felt they could personally contribute to a better environment by starting to recycle, the more meaningful they perceived recycling to be ($\beta_{meaning\_ploc}$ = .65, $t(101) = 8.49$, $p < .001$; $\beta_{meaning\_scale}$ = .75, $t(101) = 11.43$, $p < .001$). In turn, the more people thought recycling was meaningful to do, the better they expected to feel about it ($\beta_{meaning\_ploc}$ = .73, $t(101)$ = 10.71, $p < .001$; $\beta_{meaning\_scale}$ = .79, $t(101) = 13.05$, $p < .001$)[2]. In line with these findings, we found that the more strongly people felt they could contribute to a better environment by starting to recycle, the more positive emotions they expected to feel about this behavior ($\beta = .69$; $t(101) = 9.52$, $p < .001$)[3].

2 No consistent differences were found for hedonic and eudaimonic emotions; the same results were found for all emotions when looked at emotions separately.

3 No consistent differences were found for hedonic and eudaimonic emotions; the same results were found for all emotions when looked at emotions separately.

Table 1.
Results of model testing the mediating effect of the PLOC measure of meaning on the relationship between perceived environmentally-friendliness and positive emotions

Path A: effect			Path B: effect			Path C: effect			Path C': effect			Bootstrap results for indirect effect			
Perceived environmentally-friendliness > Perceived meaning			*Perceived meaning > Positive emotions*			*Perceived environmentally-friendliness > Positive emotions*			*Perceived environmentally-friendliness > Positive emotions, controlled for Perceived meaning*						
B	SE	t	B	SE	t	B	SE	t	B	SE	t	ab	SE	LL 95 CI	UL 95 CI
.70***	.08	8.49	.67***	.06	10.71	.68***	.07	9.52	.36***	.08	4.56	.31	.09	.18	.52

Note. Model = Perceived environmentally-friendliness (X) – Perceived meaning, PLOC (M): Positive emotions (Y); ab= difference between the coefficient of perceived environmentally-friendliness (X) in the analysis with (Path C') and the analysis without (Path C) meaning (M) as a covariate, LL 95 CI = Lower limit of 95% confidence interval, UL 95 CI = Upper limit of 95% confidence interval, *p<.05, **p<.01, ***p<.001 (2-tailed).

Path A: effect			Path B: effect			Path C: effect			Path C': effect			Bootstrap results for indirect effect			
Perceived environmentally-friendliness > Perceived meaning			*Perceived meaning > Positive emotions*			*Perceived environmentally-friendliness > Positive emotions*			*Perceived environmentally-friendliness > Positive emotions, controlled for Perceived meaning*						
B	SE	t	B	SE	t	B	SE	t	B	SE	t	ab	SE	LL 95 CI	UL 95 CI
.52***	.05	11.43	1.13***	.09	13.05	.68***	.07	9.52	.21*	.09	2.36	.47	.11	.27	.73

Note. Model = Perceived environmentally-friendliness (X) – Perceived meaning, scale (M): Positive emotions (Y); ab= difference between the coefficient of perceived environmentally-friendliness (X) in the analysis with (Path C') and the analysis without (Path C) meaning (M) as a covariate, LL 95 CI = Lower limit of 95% confidence interval, UL 95 CI = Upper limit of 95% confidence interval, *p<.05, **p<.01, ***p<.001 (2-tailed).

Table 2.
Results of model testing the mediating effect of the scale measure of meaning on the relationship between perceived environmentally-friendliness and positive emotions

Discussion

As expected, our results suggest that meaning provides an explanation for why personally contributing to a better environment is expected to feel good. In Study 2, we aim to replicate these results. Here, we conceptualize environmentally-friendliness in a slightly different manner. While we looked at the contribution you are *personally* making by doing the behavior in Study 1, we will look at the perceived environmentally-friendliness of your *behavior* in the following studies. The results of Study 1 show that the contribution you can make to a better environment by engaging in specific behavior is important in making this behavior meaningful. However, in daily life, people may feel their individual contribution to the environment is small, while they still may perceive their behavior as such to be environmentally-friendly. In Study 2 we therefore wanted to see whether merely seeing behavior as environmentally-friendly could make it meaningful, thereby eliciting a good feeling about acting accordingly.

The findings of Study 1 are in line with our reasoning that acting environmentally-friendly feels good because it is perceived to be meaningful, as this behavior can be seen as a form of virtuous behavior. However, Study 1 did not demonstrate yet that it is specifically the virtuous nature of environmentally friendly behavior that leads to meaning. Thus, it is possible that other positive but less virtuous characteristics of behavior (such as whether or not engagement in this behavior saves money) increases perceived meaning as well. In the following studies we want to examine whether any positive characteristics lead people to see behavior as meaningful and thereby feel good about acting accordingly. As discussed in the introduction, we expect that when compared to other positive but less virtuous characteristics, virtuous characteristics will have a particularly strong effect on perceived meaning.

Study 2

Method

Participants (N = 292; 169 female, 102 male; M_{age} = 20.23 years, SD = 2.24) completed a questionnaire that was distributed in the student center of an American university. In total 35 participants were excluded from the analyses because they had missing values on one of the dependent or independent variables.

The questionnaire started with an introduction that had two different versions. Half of the participants were told the aim of the questionnaire was to study students' attitudes towards saving money, while the other half of the participants were told the aim of the questionnaire was to study students' attitudes towards preserving the environment. As the money/environment manipulation did not affect any of the key variables in this study, the data were collapsed across conditions for the analyses.

In the questionnaire, participants were asked to evaluate four behaviors. These behaviors were the same in both versions of the questionnaire, and were selected because they could be seen as virtuous actions (preserving the environment) and as less virtuous actions (saving money): driving conservatively to save gas instead of accelerating then braking rapidly, carrying a reusable water bottle instead of buying disposable bottles, filling the washing machine to capacity instead of running it half full, eating leftovers at a later time instead of throwing them away. Evaluations of these four behaviors are averaged for the analyses.

Participants indicated on a 5-point scale (1 = *not at all*, 3 = *moderately*, 5 = *very strongly*) to what extent engaging in each of the four behaviors would elicit six emotions: good, proud, satisfied (averaged to represent positive emotions over all behaviors, our dependent variable; α's for the separate behaviors ranged from .77 to .86, $\alpha_{over\_all\_behaviors}$ = .88, *M* = 3.53, *SD* = .79), and as filler items: bad, ashamed and irritated. Next, we measured how meaningful participants perceived the behaviors to be. We now only included the relevant PLOC item (Osbaldiston & Sheldon, 2003) as an indicator of meaning[4]. Similar to Study 1, participant indicated for every behavior to what extent acting this way is something they "would personally value doing or think is meaningful to do" (representing meaning, our mediating variable; $\alpha_{over\_all\_behaviors}$ = .69, *M* = 3.45, *SD* = .92; 1 = *not at all*, 3 = *moderately*, 5 = *very much*). Again, results on the remaining PLOC items are not reported here, as they are not relevant for the goal of the current paper.

Next, to measure perceived environmentally-friendliness of the behaviors, participants indicated to what extent they thought each behavior could help preserving the environment (our independent variable; 1 = *not at all*, 3 = *moderately*, 5 = *very much*; α = .80, *M* = 3.90, *SD* = .91). Lastly, to examine whether it are particularly virtuous characteristics (i.e., environmentally-friendliness) of behavior rather than less virtuous positive characteristics that lead people to see it as meaningful and thereby feel good about acting accordingly, participants additionally indicated to what extent they thought each behavior could help save money (1 = *not at all*, 3 = *moderately*, 5 = *very much*; α = .74, *M* = 4.01, *SD* = .79).[5]

4 Additionally, we also included a habit item (do without thinking about it). Results on this item are not reported here as they are not relevant for the goal of the current paper.

5 Furthermore , we included some additional items that are not relevant for the goal of the current paper (see Appendix III). Results on these items are not reported here.

Results

To test to what extent perceiving one's behavior to be environmentally-friendly feels good because of the meaning associated with this behavior, we conducted a mediation analysis using bootstrapping (N = 1000; (Preacher & Hayes, 2004). We found that the indirect effect of perceived environmentally-friendliness on positive emotions through meaning was significant (ab = .22, 95% CI [.15, .30]; see Table 3). In other words, people feel good about engaging in behavior they perceive to be environmentally-friendly because doing so is perceived to be meaningful.

To further examine the relationship between environmentally-friendly behavior and positive emotions, we examined the separate steps of this mediation model. Regression analysis showed that the more environmentally-friendly people perceived the behaviors to be, the more meaningful they perceived these behaviors to be (β = .43, $t(255) = 7.58$, $p < .001$). In turn, the more people thought the behaviors were meaningful to do, the better they expected to feel about it (β = .67, $t(255) = 14.32$, $p < .001$)[6]. In line with these findings, our results show that the more environmentally-friendly people perceived the behaviors to be, the more positive emotions they expected to feel about acting accordingly (β = .42; $t(255) = 7.30$, $p < .001$)[7].

In addition, we wanted to examine whether these results are specific for those characteristics that make environmentally-friendly behavior virtuous behavior. When including both virtuous (whether people think it preserves the environment) and less virtuous (whether people think it saves money) characteristics of the behavior in the same model, regression analysis showed that the more environmentally-friendly people perceived the behaviors to be, the more meaningful they perceived these behaviors to be (β = .36, $t(254) = 5.23$, $p < .001$), while no such effect was found for the extent to which people believed that the behavior could save money (β = .12, $t(254) = 1.79$, $p = .074$). In line with these findings, our results show that when included in the same model, the more environmentally-friendly people perceived the behaviors to be, the more positive emotions they expected to feel about acting accordingly (β = .32; $t(254) = 4.71$, $p < .001$), while this effect was less strong for the extent to which people believed that the behavior could help save money (β = .16; $t(254) = 2.34$, $p < .05$). It thus seems to be especially those characteristics that make behavior virtuous that make behavior meaningful, thereby eliciting positive emotions about acting accordingly.

6 No consistent differences were found for hedonic and eudaimonic emotions; the same results were found for all emotions when looked at emotions separately.

7 No consistent differences were found for hedonic and eudaimonic emotions; the same results were found for all emotions when looked at emotions separately.

Path A: effect			Path B: effect			Path C: effect			Path C': effect			Bootstrap results for indirect effect			
Perceived environmentally-friendliness > Perceived meaning			*Perceived meaning > Positive emotions*			*Perceived environmentally-friendliness > Positive emotions*			*Perceived environmentally-friendliness > Positive emotions, controlled for Perceived meaning*						
B	SE	t	B	SE	t	B	SE	t	B	SE	t	ab	SE	LL 95 CI	UL 95 CI
.43***	.06	7.58	.57***	.04	14.32	.35***	.05	7.30	.13**	.04	3.12	.22	.04	.15	.30

Note. Model = Perceived environmentally-friendliness (X) – Perceived meaning (M): Positive feelings (Y); ab= difference between the coefficient of perceived environmentally-friendliness (X) in the analysis with (Path C') and the analysis without (Path C) meaning (M) as a covariate, LL 95 CI = Lower limit of 95% confidence interval, UL 95 CI = Upper limit of 95% confidence interval, *p<.05, **p<.01, ***p<.001 (2-tailed)

Table 3.
Results of model testing the mediating effect of meaning on the relationship between perceived environmentally-friendliness and positive emotions

Discussion

The results again suggest that people's perception of the environmentally-friendliness of behavior influences how meaningful this behavior is perceived to be, which in turn accounts for the positive emotions this behavior is expected to elicit, thereby replicating the findings of Study 1. Furthermore, Study 2 suggests meaning not only seems to explain why feeling you can *personally* contribute to environmental quality can feel good, but also why feeling your *behavior* can contribute to environmental quality can feel good.

Adding to Study 1, the results of Study 2 suggest this pattern seems to be specific for virtuous characteristics of behavior: how environmentally-friendly behavior is perceived to be. For other positive characteristics – in this case the perceived monetary savings the behavior can achieve – no relationship with meaning and a less strong relationship with positive emotions was found. This confirms that there is something special about environmentally-friendly behavior that causes these results. Not any positive characteristic leads people to see behavior as meaningful and thereby makes them feel good about acting accordingly; rather, this effect seems to be specific for those aspects that make behavior virtuous.

Next, we aimed to replicate this pattern of findings while studying actual behavior. To see whether meaning can also explain why people feel good about environmentally-friendly behavior they actually engage in, we additionally test our model in a field setting in Study 3.

Study 3

Method

The field experiment took place in a university cafeteria, where each day two different soups were sold during lunch time. On randomly assigned days, we placed a sign advertising one of the daily soups as an "environmentally-friendly choice", while no sign was placed next to the other soup on those days (see Appendix IV for sign). On the remaining days, the soup buffet was left as it normally is: without a sign. As advertising soup as an environmentally-friendly choice did not affect any of the key variables in this study, the data were collapsed across conditions for the analyses.

Participants (N = 156; 72 female, 81 male, 3 unknown; M_{age} = 23.19 years, SD = 3.48) were approached to complete a questionnaire right after they paid for their soup. In total 18 participants were excluded from the analyses because they did not complete the questionnaire on their own or had missing values on one of the dependent or independent variables.

The questionnaire started by asking participants which kind of soup they bought, to allow us to identify the experimental condition they were in. To again examine whether any positive characteristics of behavior lead people to see it as meaningful and thereby feel good about acting accordingly, participants rated their soup on several aspects ("This soup is… tasty, … filling, … healthy, … fresh, … warm") on a 5 point scale (1 = *not at all*, 3 = *moderately*, 5 = *very*).

First, participants indicated on a 5-point scale (1 = *not at all*, 3 = *moderately*, 5 = *very*) to what extent buying the soup they just bought elicited each of eight emotions: good, satisfied, proud, content (averaged to represent positive emotions, our dependent variable; α = .58, *M* = 3.34, *SD* = .59), and as filler items: uncomfortable, bad, irritated and ashamed. Next, we measured how meaningful participants perceived the behaviors to be. Participants indicated to what extent buying the soup they just bought elicited a "feeling I did something meaningful or valuable" (meaning, our mediating variable; *M* = 2.25, *SD* = 1.12; 1 = *not at all*, 3 = *moderately*, 5 = *very*).[8]

Lastly, to measure perceived environmentally-friendliness of the behavior, participants indicated to what extent they thought they made an environmentally-friendly choice by buying this soup (our independent variable; *M* = 2.69, *SD* = 1.01; 1 = *not at all*, 3 = *moderately*, 5 = *very*). The questionnaire ended with some general questions on gender, age, nationality, major, how often they eat in the cafeteria and how often they buy soup when eating in the cafeteria.

Results

To test to what extent perceiving one's behavior to be environmentally-friendly feels good because of the meaning associated with this behavior, we conducted a mediation analysis using bootstrapping (*N* = 1000; Preacher & Hayes, 2004). We found that the indirect effect of perceived environmentally-friendliness on positive emotions through meaning was significant (*ab* = 06, 95% CI [.02, .12]; see Table 4). In other words, people feel good about a soup-purchase they perceive to be environmentally-friendly because this behavior can be seen as meaningful.

To further examine the relationships between environmentally-friendly behavior and positive emotions, we examined the separate steps of this mediation model. Regression analysis showed that the more environmentally-friendly customers perceived their choice to buy this soup to be, the more meaningful they perceived their purchase to be (β = .38; $t(136) = 4.77$, $p < .001$). In turn, the more people thought their purchase was meaningful to do, the better they felt about it (β = .34. $t(136) = 4.14$, $p < .001$)[9]. In line with these findings, our results show that the more people perceived

8 Participants also indicated to what extent buying the soup they just bought elicited a "feeling I did something fun or pleasurable". Results on this item are not reported here as they are not relevant for the goal of the current paper.

9 When looked at separate positive emotions we only find a significant effect on the eudaimonic emotions "good" and "proud".

their soup-purchase to be an environmentally-friendly choice, the stronger positive emotions this purchase elicited (β = .25; $t(136) = 2.95$, $p < .01$)[10].

In addition, we wanted to examine whether these results are specific for those characteristics that make the behavior virtuous behavior. When all characteristics are included in the same model, regression analysis showed that the more environmentally-friendly customers perceived their choice to buy this soup to be, the more meaningful they perceived their purchase to be (β = .32; $t(126) = 3.80$, $p < .001$). The only other positive characteristic that affected perceived meaning was how healthy people thought the soup was (β = .30; $t(126) = 2.93$, $p < .01$), which can be argued to be a virtuous feature as well, as a healthy choice is generally considered to be 'good'. Especially those positive characteristics that make behavior virtuous thus seem to make this behavior meaningful. In line with these findings, our results show that, when all characteristics are included in the same model, the more people perceived their soup-purchase to be an environmentally-friendly choice, the more positive emotions this purchase elicited (β = .18; $t(126) = 2.10$, $p < .05$). The only other positive characteristic that affected how people felt about their purchase was how tasty they thought the soup was (β = .33; $t(126) = 3.81$, $p < .001$). This indicates that, while consumers feel better about purchasing a soup that is tasty, the extent to which they perceive their soup-purchase to be an environmentally-friendly choice affects both the meaning associated with behavior and how good they feel about it.

10 When looked at separate positive emotions we only find a significant effect on the eudaimonic emotions "good" and "proud".

Table 4.
Results of model testing the mediating effect of meaning on the relationship between perceived environmentally-friendliness and positive emotions

Path A: effect			Path B: effect			Path C: effect			Path C': effect			Bootstrap results for indirect effect			
Perceived environmentally-friendliness > Perceived meaning			*Perceived meaning > Positive emotions*			*Perceived environmentally-friendliness > Positive emotions*			*Perceived environmentally-friendliness > Positive emotions, controlled for Perceived meaning*						
B	SE	t	B	SE	t	B	SE	t	B	SE	t	ab	SE	LL 95 CI	UL 95 CI
.42***	.09	4.77	.17***	.04	4.14	.14**	.05	2.95	.08	.05	1.60	.06	.03	.02	.12

Note. Model = Perceived environmentally-friendliness (X) – Perceived meaning (M): Positive feelings (Y); ab= difference between the coefficient of perceived environmentally-friendliness (X) in the analysis with (Path C') and the analysis without (Path C) meaning (M) as a covariate, LL 95 CI = Lower limit of 95% confidence interval, UL 95 CI = Upper limit of 95% confidence interval, *p<.05, **p<.01, ***p<.001 (2-tailed)

General discussion

The three studies described in this paper suggest that how environmentally-friendly behavior is perceived to be affects the meaning people associate with the behavior, in turn influencing how people (expect to) feel about acting this way. People perceived the same behaviors to be more meaningful when they believed they would personally contribute to a better environment by engaging in it (Study 1) and when they saw the behavior itself as more environmentally-friendly (Study 2 and 3). In turn, the more meaningful people thought their behavior was, the better they expected to feel (Study 1 and 2) and the better they actually felt (Study 3) about engaging in this behavior. We replicated these findings across studies that included different types of environmentally-friendly behavior, suggesting this is a consistent pattern. Together these results suggest that engagement in environmentally-friendly behavior can feel good because such behavior is perceived to be meaningful.

As expected, our results furthermore suggest that not any positive characteristics can make behavior meaningful and thereby make engagement feel good. We found that especially the virtuous characteristics of behavior – most importantly its positive consequences for the environment – drive these effects. Enhancing or highlighting the virtuous aspects behavior has, may therefore provide to be a fruitful way to increase the meaning people attribute to this behavior, and thereby the positive emotions this behavior elicits. As virtuous aspects seem to play an important role in the meaning and positive emotions behavior elicits, an interesting question for future research is what happens when virtues conflict within the same behavior. Such conflicts may arise within the domain of environmental consequences itself – for instance, when the placement of windmills (having positive consequences for the global environment in the long run) harms nesting birds in the placement area (having negative consequences for the local environment in the short run). As positive environmental consequences are not the only characteristics that can make behavior virtuous, however, such conflicts may also arise between different domains of virtues – for instance, when environmentally-friendly solutions mean a loss of jobs, thereby harming people. Future research could study whether being virtuous in one way or the other would make behavior meaningful by definition, or whether a conflict between different virtues would detract from the meaning people attribute to this behavior, thereby eliciting a less positive feeling.

In the current paper, we questioned the notion that the link between environmentally friendly actions and well-being can only be attributed to external factors. Instead, we argued there is something specific about environmentally-friendly behavior *itself* that makes people feel good about acting this way. As our results show, people feel good about engaging in behavior they perceive to be environmentally-friendly,

because these environmental benefits can make behavior meaningful. Furthermore, it were specifically those characteristics that made behavior virtuous that elicit a sense of meaning and thereby make engagement feel good. Although there may still be external factors that link environmentally-friendly behavior to well-being, the current paper thus suggests it may also be the meaning that is associated with environmentally-friendly behavior itself that makes engagement feel good.

Appendix I

How condition instructions

Suppose a new recycling facility would open in your community, that would allow people to sort all of their recyclables (aluminum, glass, paper and organics/compost), and process them separately from non-recyclables. Imagine you have never tried to recycle before, and now start to change your household routine to one in which you separate your garbage into different types.

In the space below, please describe HOW you would alter your household routine to sort your garbage. As somebody who has never recycled before, what would you have to find out about recycling practices, and what kind of actions would you have to take? You can think for instance of finding out into which specific category your garbage falls, and buying separate bins to collect separate streams in.

Please type MAX 4 answers to the question "HOW would you start recycling, and make the effort to change your routine?"

Why condition instructions

Suppose a new recycling facility would open in your community, that would allow people to sort all of their recyclables (aluminum, glass, paper and organics/compost), and process them separately from non-recyclables. Imagine you have never tried to recycle before, and now start to change your household routine to one in which you separate your garbage into different types.

In the space below, please describe WHY you would alter your household routine to sort your garbage. As somebody who has never recycled before, what reasons might there be to start recycling, why would you view it as appropriate and necessary for you to do? You can think for instance of the positive effects recycling would have on the global environment or on your community.

Please type MAX 4 answers to the question "WHY would you start recycling, and make the effort to change your routine?"

Appendix II

Additional questions Study 1.

In addition to the measures described in the Method section, we included some additional items that are not relevant for the goal of the current paper. Participants indicated to what extent they agreed that starting to recycle would "be easy", "be a hassle (R)", "be enjoyable", "cause discomfort" (R), and "be bothersome" (R). To measure competency in recycling itself, participants indicated their agreement with the following items: "I could successfully start to recycle", "I know how to start to recycle" and "I have the necessary resources to start to recycle" (1 = *strongly disagree*, 5 = *strongly agree*). We also asked participants to what extent they agree engagement in environmental behavior in general is valuable (valuable, important, meaningful, the right thing to do; 1 = *not at all*, 3 = *moderately*, 5 = *very much*), to what extent they see themselves as an environmentally-friendly person (Van der Werff, Steg, & Keizer, 2014b; 1 = *totally disagree*, 7 = *totally agree*), and to what extent they see "living in an environmentally-sustainable way" as a goal that is important to them (1 = *not at all*, 3 = *somewhat*, 5 = *very*) and that they strive towards in daily life (1 = *not hard at all*, 3 = *somewhat hard*, 5 = *very hard*; added to walk-talk scale by Sheldon & Krieger, 2014). Furthermore, participants indicated their intention to engage in other environmentally-friendly behavior (buy locally produced products, eat vegetarian meals, use biodegradable soap and shampoo, buy secondhand instead of new products, use bicycle or walk to travel short distances, eat leftovers at a later time instead of throwing them away; 1 = *(almost) never*, 5 = *(almost) always*). Lastly, participants completed the Meaning In Life scale (Steger, Frazier, Oishi, & Kaler, 2006; 1 = *absolutely untrue*, 4 = *can't say true or false*, 7 = *absolutely true*). Results on these items are not reported here.

Appendix III

Additional questions Study 2.

In addition to the measures described in the Method section, we included some additional items that are not relevant for the goal of the current paper. All participants indicated their intention to engage in other environmentally-friendly behaviors (buy locally produced products, eat vegetarian meals, use biodegradable soap and shampoo, buy secondhand instead of new products, separate your waste, riding your bicycle to the university instead of driving your car; 1 = *(almost) never*, 5 = *(almost) always*) and whether acting this way would save or cost money, compared to their usual behavior (1 = *save a lot*, 3 = *costs are equal*, 5 = *cost much more*). Results on these items are not reported here, as they are not relevant for the goal of the current paper.

Appendix IV

Sign placed next to one of the soups in the experimental condition.

chapter 5

Why acting environmentally-friendly feels good

Exploring the role of self-image

Abstract

Recent research suggests that engagement in environmentally-friendly behavior can bring well-being. This positive relationship is often explained as an indirect one: the things that actually make us happy, like social relationships and personal growth, can be better for the environment at the same time. We however expect environmentally-friendly behavior may also affect well-being more directly: making an environmentally-friendly choice can be perceived as doing something meaningful, and therefore interpreted as a signal that one is a good person. Our findings suggest that engagement in (volitional) environmentally-friendly behavior indeed affects how people see themselves: participants saw themselves as being more environmentally-friendly (Study 1) and better persons in general (Study 2) when they (voluntarily) engaged in more environmentally-friendly behavior. In turn, the more environmentally-friendly (Study 1) and positive (Study 2) they saw themselves, the better they felt about acting environmentally-friendly. Together these results suggest that the positive self-signal that ensues from environmentally-friendly behavior may explain why engagement in this behavior can bring well-being.

This chapter is based on Venhoeven, L. A., Bolderdijk, J. W., & Steg, L. (Invited to resubmit) Why acting environmentally-friendly feels good: exploring the role of self-image. *Frontiers in Environmental Psychology*

Introduction

Research shows that people associate environmentally-friendly behaviors with positive emotions and that people who act environmentally-friendly experience more happiness and higher life satisfaction (Brown & Kasser, 2005; Kasser & Sheldon, 2002; Xiao & Li, 2011). The process behind this relationship, however, remains unclear (Venhoeven, Bolderdijk, & Steg, 2013). *Why* engagement in environmentally-friendly behavior would bring well-being, is therefore an important question to answer.

An explanation often provided for why environmentally-friendliness is related to well-being, is that of a disconnect between consumption and well-being (Beavan, 2009; T. Jackson, 2005). Over-consumption is seen as an important indicator of an environmentally-unfriendly lifestyle – consuming more than we need equals unnecessary emissions and exhaustion of resources. At the same time, having a primary focus on acquiring more "stuff" has been shown to be unrelated or even detrimental to well-being (Dittmar, Bond, Hurst, & Kasser, 2014; Hurst, Dittmar, Bond, & Kasser, 2013; Kasser & Ryan, 1993; Kasser, 2002), since consumers who direct their financial resources to acquiring physical goods are typically less focused on cultivating social relationships and personal growth (Burroughs & Rindfleisch, 2002b). Unlike consumption, however, social relationships and personal growth actually contribute to people's well-being (Myers, 2000; Ryan & Deci, 2000b). Redirecting one's focus away from acquiring more physical goods and towards social relationships and personal growth does thus not only lead to a smaller environmental impact, but it makes people happier at the same time.

Although a disconnect between consumption and well-being may indeed exist, the line of argumentation described above says nothing about environmentally-friendly behavior as a *source* of well-being. It seems merely by coincidence that the things that make us happy are also less harmful for the environment. In the current paper we wonder whether the relationship between these constructs is indeed more or less coincidental, or whether acting environmentally-friendly itself may feel good as well.

We suggest acting environmentally-friendly itself may feel good because this behavior can signal something positive about who you are. People strive to hold a positive self-image (Aronson, 1992; Conway & Peetz, 2012; Mazar & Zhong, 2010; Sachdeva et al., 2009), and seeing themselves as a virtuous or moral person is an important aspect of such a positive self-image (Aquino & Reed, 2002). As people derive their self-image from their actions (Bem, 1967; Bem, 1972), how virtuous a person they perceive themselves to be depends on how moral and thereby meaningful their behavior is (Dunning, 2007; Sachdeva et al., 2009). If you engage in good behavior you must be a good person, leading to a positive self-image.

Because of the positive consequences environmentally-friendly behavior has for nature and other people now and in the future, acting this way can be seen as moral and thereby meaningful behavior (Heberlein, 1972; Leopold, 1949; Thøgersen, 1996). Acting environmentally-friendly may therefore not only lead people to see themselves as a more environmentally-friendly person (Cornelissen et al., 2008; Van der Werff et al., 2014b), it may also lead them to see themselves as being a better person in general (Taufik et al., 2015). How positive people think of themselves is an important determinant of how good they feel (Baumeister, 1993; Taylor & Brown, 1988). If acting environmentally-friendly leads to a positive self-image, this behavior could therefore bring well-being as well.

For environmentally-friendly behavior to send a positive self-signal, two aspects thus seem to be important. Firstly, the behavior needs to be seen as meaningful behavior, and secondly, the behavior needs to say something about you as a person. In the current paper, we examine this second aspect in more detail. Specifically, we look at the role of volition in the self-signal environmentally-friendly behavior sends. When people voluntarily choose to engage in certain behavior, this signals to themselves that they value the chosen behavior and want to act accordingly: they attribute the choice for engagement to internal instead of external causes (Ryan & Deci, 2000a; Ryan & Deci, 2000b; Van der Werff et al., 2014b). *Making the choice* to engage in certain behavior rather than acting out of situational constraints may therefore particularly reveal something about who you are – not only to others, but also to yourself (Bodner & Prelec, 2003). If acting environmentally-friendly feels good because of the self-signal this behavior sends, especially those who behave this way out of their own volition may thus feel good about their behavior.

The current paper

In the current paper we aim to test whether acting environmentally-friendly feels good because this behavior signals something positive about who you are – especially when the choice for the behavior is made voluntarily.

We expect that acting environmentally-friendly affects people's self-image. Following our reasoning above, we expect that people will see themselves as more environmentally-friendly (Study 1) and experience a boost in their self-image (Study 2) when they perceive their behavior to be more environmentally-friendly – especially when engagement in this behavior is voluntary. In turn, we expect that the more environmentally-friendly or positive people's self-image is, the better they will feel about engaging in the behavior causing this self-image. Following this reasoning, lastly, we expect that people will feel better about more environmentally-friendly and voluntarily chosen behavior.

Study 1

Method

Participants (80 female, 90 male, 8 unknown; M_{age} = 31.6 years, *SD* = 14.8) completed a questionnaire in a supermarket, right after they paid for their groceries. In total 178 people agreed to complete the questionnaire that took approximately 10 minutes to fill out; 18 participants were excluded from the analyses because they had missing variables on at least one of the variables included in the analyses.

How environmentally-friendly participant perceived their purchase to be, our independent variable, was operationalized in two ways. First, participants indicated whether they just bought any environmentally-friendly products (yes/no). The label 'environmentally-friendly' was not defined explicitly, to allow participants to include any products they personally deemed environmentally-friendly. Second, participants who indicated they bought one or more environmentally-friendly products (47 out of the 178 indicated they did; 6 participants did not answer this question), were asked to estimate the percentage of environmentally-friendly products out of their total purchase (*M* = 43.78%, *SD* = 27.64).

To examine how people's purchases influenced their self-image, participants then answered three statements: "Behaving environmentally-friendly is an important part of who I am", "I'm the type of person that behaves environmentally-friendly" and "I see myself as an environmentally-friendly person" (environmental self-image; Van der Werff, Steg, & Keizer, 2013; α = .89, *M* = 4.23, *SD* = 1.16).

As a filler task, all participants additionally indicated why they made the purchases they did ("These products are better for the environment", "Other people also bought these products", "These products are healthy", "These products are of good quality", "I felt morally obliged to buy these products" and "Other reason, namely …"). This list also included three items that measured our moderator variable: volition of the purchase ("I wanted to buy these products", "These products were the only products left in this category" (R) and "Somebody else asked me to buy these products" (R); 1 = *completely disagree*, 7 = *completely agree*). We looked at the effect of the items that measured volition separately, as the alpha for the scale comprising the different items was low (α = .20, *M* = 6.44, *SD* = .65).

As our dependent variable, all participants indicated on a 7-point scale (1 = *completely disagree* to 7 = *completely agree*) to what extent purchasing the products they just paid for elicited each of 6 emotions: good, proud, cheerful (averaged to represent positive emotions; α = .75, *M* = 4.15, *SD* = 1.09), and as filler items: bad, guilty and frustrated. The questionnaire ended with demographics (age, gender, income, highest education level).[1]

Participants were randomly assigned to either first answer the questions about how environmentally-friendly they perceived their purchases and themselves to be, or to first answer the questions about the emotions their purchases elicited. The questions about the reasons for purchase were always asked in-between these two blocks and the demographics were always asked last. The order of the questions did not affect any of our results.

Results

To test whether acting environmentally-friendly feels good because of the self-signal this behavior sends, we conducted a mediation analysis using bootstrapping (*N* = 1000; Preacher & Hayes, 2004). Our analysis showed that the indirect effect of environmentally-friendly purchase (yes/no) on positive emotions through environmental self-image was significant (*ab* = .15, 95% CI [.03, .36]; see Table 1). In other words, consumers seem to feel better after purchasing environmentally-friendly products (versus not buying environmentally-friendly products) because this behavior brings an environmentally-friendly self-image. Within the group of participants who indicated to have purchased one or more environmentally-friendly products (*N* = 47), no mediation of environmental self-image was found for the relationship between percentage of environmentally-friendly purchase and positive emotions (*ab* = .0009, 95% CI [-.002, .005]; see Table 2).

To further examine the relationships between environmentally-friendly behavior and positive emotions, we examined the separate steps of this mediation model. Univariate analysis of variance shows that consumers who just bought environmentally-friendly products saw themselves as being more environmentally-friendly (*M* = 4.84) than consumers who did not buy environmentally-friendly products (*M* = 3.99; $F(1,156) = 19.85$, $p < .001$, $\eta p^2 = .11$). Furthermore, within the group of participants who indicated to have purchased one or more environmentally-friendly products, we found that those who bought a larger share of environmentally-friendly products also saw themselves as being a more environmentally-friendly person (*B* = .01, $t(44) = 2.24$, $p < .05$, $R^2 = .10$). The extent to which the behavior was perceived as a voluntary

1 Participants additionally indicated whether their purchase elicited a "feeling I did something fun or pleasant" and a "feeling I did something meaningful or valuable" (1 = completely disagree to 7 = completely agree). Results on these last two constructs are not reported here, as they are outside of the scope of the current paper.

choice[2], however, was not found to affect the relationships between environmentally-friendly purchases and environmental self-image ($B_{interaction\_yes/no}$ = -.01, p = .95; $B_{interaction\_percentage}$ = .00, p = .93). These results support a relationship between engagement in environmentally-friendly consumption and people's perception of themselves as environmentally-friendly, but did not show volition affected this relationship.

Next, we examined the relationship between environmental self-image and the feelings elicited by the behavior. As expected, linear regression showed that the self-image elicited by the behavior in turn affected how people felt about their purchase. The more they saw themselves as someone who acts environmentally-friendly, the better people felt about their purchases (B = .16, $t(156)$ = 2.16, $p < .05$)[3]. Lastly, multivariate analysis of variance did not show a direct effect of whether people just bought environmentally-friendly products on how positive they felt about their purchase ($F(1,156)$ = .002, p = .96)[4]. However, in line with our other findings, linear regression showed that within the group that indicated to have purchased environmentally-friendly products, a larger share of environmentally-friendly products was related to feeling better about one's purchase (B = .01, $t(44)$ = 2.41, $p < .05$)[5].

2 As the results for all three volition items were similar, we only report the results for the item "I wanted to buy these products" here. We found similar results when testing a moderated-mediation model using bootstrapping.

3 When looked at separate positive emotions we only find a significant effect on the emotion "good".

4 No consistent differences were found for hedonic and eudaimonic emotions; the same results were found for all emotions when looked at emotions separately.

5 When looked at separate positive emotions we only find a significant effect on the emotion "good".

Path A: effect			Path B: effect			Path C: effect			Path C': effect			Bootstrap results for indirect effect			
Environmentally-friendly purchase > Environmental Self-Image			*Environmental Self-Image > Positive emotions*			*Environmentally-friendly purchase > Positive emotions*			*Environmentally-friendly purchase > Positive emotions, controlled for Environmental Self-Image*						
B	SE	t	B	SE	t	B	SE	t	B	SE	t	ab	SE	LL 95 CI	UL 95 CI
.86***	.19	4.46	.16*	.07	2.16	.01	.19	.05	-.14	.20	-.72	.15	.08	.03	.36

Note. Model = Environmentally-friendly purchase (X) - Environmental Self-Image (M): Positive emotions (Y)ab= difference between the coefficient of environmentally-friendly purchase (X) in the analysis with (Path C') and the analysis without (Path C) environmental self-image (M) as a covariate, LL 95 CI = Lower limit of 95% confidence interval, UL 95 CI = Upper limit of 95% confidence interval, *p<.05, **p<.01, ***p<.001(2-tailed)

Table 1.
Results of model testing the mediating effect of environmental self-image on the relationship between environmentally-friendly purchase and positive emotions

Table 2.
Results of model testing the mediating effect of environmental self-image on the relationship between percentage of environmentally-friendly purchase and positive emotions

Path A: effect			Path B: effect			Path C: effect			Path C': effect			Bootstrap results for indirect effect			
Percentage of environmentally-friendly purchase > Environmental Self-Image			*Environmental Self-Image > Positive emotions*			*Environmentally-friendly purchase > Positive emotions*			*Percentage of environmentally-friendly purchase > Positive emotions*, controlled for *Environmental Self-Image*						
B	SE	t	B	SE	t	B	SE	t	B	SE	t	ab	SE	LL 95 CI	UL 95 CI
.01*	.006	2.24	.16*	.07	2.16	.01*	.006	2.41	.01*	.006	2.12	.0009	.002	-.002	.005

Note. Model = Percentage of environmentally-friendly purchase (X) – Environmental Self-Image (M): Positive emotions (Y); ab= difference between the coefficient of percentage of environmentally-friendly purchase (X) in the analysis with (Path C') and the analysis without (Path C) environmental self-image (M) as a covariate, LL 95 CI = Lower limit of 95% confidence interval, UL 95 CI = Upper limit of 95% confidence interval, *p<.05, **p<.01, ***p<.001(2-tailed)

Discussion

The results of Study 1 suggest that environmentally-friendly purchases influence how people see themselves, which in turn may account for the positive feelings this type of purchases elicits. Although the current study showed that environmentally-friendly purchases were related to a more environmentally-friendly self-image, and that a more environmentally-friendly self-image was related to more positive feelings about the purchase, causality could not be established. It could for instance also be possible that people who see themselves as being more environmentally-friendly, purchase (a larger share of) environmentally-friendly products. In the next study we will use an experimental manipulation to test more directly whether the causality runs from behavior to self-concept, rather than the other way around. Specifically, this time we varied instead of measured the extent to which the environmentally-friendly behavior was voluntary or not.

We hypothesized that behavior may especially signal something positive about you when the choice for engagement in the behavior is made voluntarily. However, this reasoning was not supported in Study 1. Since the average score on all volition items was high, a ceiling effect could explain this lack of result: people generally perceived their purchases to be their own choice. In the next study we will therefore manipulate the extent to which the behavior is voluntary, in order to study the effect of volition more directly.

Lastly, Study 1 examined behavior's effect on how environmentally-friendly people perceived themselves to be. As we reason in the introduction, environmentally-friendly behavior can be seen as moral and thereby meaningful behavior. Thereby, seeing yourself as someone who acts environmentally-friendly could be interpreted as something positive: it would mean that you are someone who does good. In Study 2 we will test this reasoning more directly and look whether environmentally-friendly behavior can indeed give a boost to how people see themselves, i.e. leads to a positive self-image for those who engage in this type of behavior.

Study 2

Method

Participants (85 female, 69 male, 5 unknown; M_{age} = 31.2 years, *SD* = 16.2) completed a questionnaire while they were waiting for or traveling by train. In total 159 people agreed to complete the questionnaire that took approximately 5 minutes to fill out; 8 participants were excluded from the analyses since they had missing variables on one of the dependent or independent variables.

Participants indicated to what extent five statements about engagement in several environmentally-friendly behaviors (taking a shower that lasts less than 10 minutes, buying organic products, separating waste, using the bike for short distances and washing clothing on a low temperature) were applicable to them (1 = *not at all applicable to me*, 7 = *completely applicable to me*; α = .60, *M* = 4.55, *SD* = 1.30). As our independent variable, volition was manipulated as a between-subjects factor by introducing and framing these behaviors as behaviors the participants decided to engage in out of their own volition (e.g. "I sometimes take a shower that lasts less than 10 minutes, even though I have enough time to stay in the shower for as long as I'd like"; volitional), or as behaviors participants engaged in out of situational constraints (e.g. "I sometimes take a shower that lasts less than 10 minutes because of time restraints"; non-volitional).

To examine to what extent the volition framing would lead to a positive self-image, participants then answered three statements: "The environmentally-friendly behaviors above … say something positive about who I am" "… indicate I'm a good person" "… show I'm someone who does the right thing" (1 = *completely disagree*, 7 = *completely agree*; α = .85, *M* = 3.81, *SD* = 1.54). As our dependent variable, participants then indicated to what extent the behaviors they just rated would elicit each of 12 emotions on a 5-points scale (1 = *not at all*, 3 = *moderately*, 5 = *very strongly*): good, satisfied, proud, happy, cheerful, inspired (averaged to represent positive emotions; α = .88, *M* = 2.92, *SD* = .90), and as filler items: frustrated, bad, uncomfortable, guilty, disappointed and unhappy. The questionnaire ended with demographics (age, gender, income, highest education level).

Results

To test whether voluntary (versus non-voluntary) engagement in environmentally-friendly behavior feels good because of the positive self-signal this behavior sends, we conducted a mediation analysis using bootstrapping (*N* = 1000; Preacher & Hayes, 2004). Our analysis showed that the indirect effect of voluntary engagement in environmentally-friendly behavior on positive emotions through the positive self-image this behavior elicits was significant (*ab* = .21, 95% CI [.07, .36]; see Table 3).

In other words, people seem to expect to feel better about voluntary (versus non-voluntary) environmentally-friendly behavior because it brings a positive self-image.

To further examine the relationships between environmentally-friendly behavior and positive emotions, we examined the separate steps of this mediation model. As expected, univariate analysis of variance shows that participants felt the environmentally-friendly behaviors reflected more positively on who they are when the behaviors were voluntarily chosen ($M = 4.13$, $SD = 1.48$) than when the behaviors were not voluntarily chosen ($M = 3.42$, $SD = 1.48$; $F(1,150) = 8.33$, $p < .01$, $\eta p^2 = .053$). Furthermore, linear regression showed that the more positive the self-image behavior elicited was, the better people expected to feel about acting accordingly ($B = .28$, $t(149) = 6.78$, $p < .001$, $R^2 = .24$)[6]. Univariate analysis of variance, however, did not show a direct effect of voluntary (versus non-voluntary) environmentally-friendly behavior on how people expected to feel about acting accordingly ($F(1,150) = .06$, $p = .80$, $\eta p^2 < .001$)[7].

6 No consistent differences were found for hedonic and eudaimonic emotions; the same results were found for all emotions when looked at emotions separately.

7 No consistent differences were found for hedonic and eudaimonic emotions; the same results were found for all emotions when looked at emotions separately.

Table 3.
Results of model testing the mediating effect of positive self-image on the relationship between perceived environmentally-friendliness and positive emotions

Path A: effect *Voluntary engagement > Positive Self-Image*			Path B: effect *Positive Self-Image > Positive emotions*			Path C: effect *Voluntary engagement > Positive emotions*			Path C': effect *Voluntary engagement > Positive emotions*, controlled for *Positive Self-Image*			Bootstrap results for indirect effect			
B	SE	t	B	SE	t	B	SE	t	B	SE	t	ab	SE	LL 95 CI	UL 95 CI
.70**	.24	2.89	.28***	.04	6.78	-.04	.15	-0.26	-.25	.13	-1.92	.21	.08	.07	.36

Note. Model = Voluntary engagement (X) - Positive self-image (M): Positive emotions (Y); ab= difference between the coefficient of voluntary engagement (X) in the analysis with (Path C') and the analysis without (Path C) positive self-image (M) as a covariate, LL 95 CI = Lower limit of 95% confidence interval, UL 95 CI = Upper limit of 95% confidence interval, *p<.05, **p<.01, ***p<.001(2-tailed)

General discussion

The two studies described in this paper suggest that environmentally-friendly behavior affects how people see themselves, which in turn affects how they feel about engaging in this behavior. People perceived themselves to be more environmentally-friendly after purchasing (a larger share of) environmentally-friendly products (Study 1), and saw themselves as a better person in general if they indicated how often they engage in several common environmentally-friendly behaviors out of their own volition (versus not out of their own volition; Study 2). In turn, the more people saw themselves as an environmentally-friendly and good person, the more positive they felt about this behavior (Study 1 and 2). Together these results suggest that engagement in environmentally-friendly behavior can feel good because it sends a desirable self-signal. Since findings for the direct effect of environmentally-friendly behavior on positive emotions were mixed, however, the circumstances under which the behavior itself feels good need to be examined in more detail in future research.

An interesting question for future research is in which direction the relationship between behavior and elicited emotions runs. Study 2 provides a strong suggestion that (volition of) behavior can influence the positivity of the self-image elicited. However, this study does not exclude that the relationship between behavior and self-image also runs in the other direction. In fact, it is likely that causality between environmentally-friendly behavior, the self-image this behavior elicits, and positive emotions runs in both directions. Research on environmentally-friendly behavior shows that previous behavior can influence the self-image people have, but that this self-image can also influence the behavior people engage in (Van der Werff, Steg, & Keizer, 2014a). Furthermore, research on pro-social behavior shows that this type of behavior can make people feel good, but that people who feel good also act more pro-socially (Aknin et al., 2012). Given that both pro-social and environmentally-friendly behavior could be seen as meaningful behavior, it is not unlikely that the relationship between environmentally-friendly behavior and feeling good runs in both directions as well. An important question to ask, therefore, is how a positive spiral of environmentally-friendly behavior, self-image and feeling good can be put in motion, and what the boundaries of this circular relationship are.

We started this paper by questioning whether environmentally-friendliness and well-being are only linked indirectly, or whether engagement in environmentally-friendly behavior may also feel good in itself. The two studies described in this paper show that engagement in environmentally-friendly behavior can influence how people see themselves, which is in turn related to how people feel about engagement in environmentally-friendly behavior. These results are a first indication that environmentally-friendly behavior may not just be a side-effect of a happy life, but that the behavior itself can also influence how people feel, through its effect on how they see themselves.

chapter 6

General discussion

As U.S. president Barack Obama stated in his speech at the 2014 Climate Summit "We are the first generation to feel the impact of climate change and the last generation that can do something about it" (original quote by Governor Jay Inslee). In order to effectively "do something" about climate change, it is crucial that individuals change their behavior to reduce their environmental impact (Chiras, 2011; IPCC (Intergovernmental Panel on Climate Change), 2007). Unfortunately, acting environmentally-friendly is often implied to mean sacrificing personal well-being, since this type of behavior can involve some degree of effort and discomfort (De Young, 1990-1991). If this negative view has merit it may thus be difficult to motivate people to engage in environmentally-friendly action.

In the current dissertation we wondered whether engaging in environmentally-friendly behavior indeed means one has to sacrifice well-being and feel bad. We argued that viewing environmentally-friendly behavior solely as a sacrifice overlooks that it can also be perceived as meaningful behavior. Research shows that how comfortable engaging in the a specific action is, is not the only factor that determines whether people feel good or bad about their behavior; behavior may also feel good when it is perceived as a virtuous act (Anik, Aknin, Norton, Dunn, & Quoidbach, 2013; Grant & Sonnentag, 2010; Meier & Stutzer, 2008; Rudd, Aaker, & Norton, 2014). Opposite to the negative view above, we therefore propose that acting environmentally-friendly may actually contribute to personal well-being. The studies reported in this dissertation examine whether and why this may be the case.

Summary of the main findings

Do people have a positive emotional association with environmentally-friendly behavior itself?

Research shows that environmentally-friendliness and well-being can indeed be related (Brown & Kasser, 2005; Helliwell et al., 2012; Kasser & Sheldon, 2002; Welsch & Kühling, 2011; Xiao & Li, 2011). Correlational studies for instance show that consuming more environmentally-friendly is linked to greater personal well-being (Brown & Kasser, 2005), higher overall life-satisfaction (Xiao & Li, 2011), and more happiness (Kasser & Sheldon, 2002). Different explanations have been provided for this finding. Usually, however, these explanations do not focus on characteristics of environmentally-friendly behavior itself, but rather point to factors external to the behavior. Some suggest that the things that actually make us happy, like social relationships and personal growth, happen to be sustainable at the same time (Beavan, 2009; Csikszentmihalyi, 2000; T. Jackson, 2005; Kasser, 2009). Others propose that individual characteristics, such as being mindful, can both lead to environmentally-friendly behavior and increased well-being (Brown & Kasser, 2005).

In the current dissertation we wondered whether the relationship between environmentally-friendly behavior and well-being can indeed only be explained by factors external to this behavior. Could characteristics of environmentally-friendly behavior *itself* not make people feel good as well?

To provide a theoretical answer to why environmentally-friendly behavior itself could contribute to or detract from well-being, we distinguished between the hedonic (i.e. pleasure) and the eudaimonic (i.e. meaning) route towards well-being in Chapter 2. We argued that pleasure and meaning may be linked to environmentally-friendly behavior in differing degrees. Pleasure or comfort, on the one hand, may only be associated with specific environmentally-friendly behaviors. While cycling on a warm spring day for instance may be evaluated as very comfortable, taking a cold shower in winter is most probably not. In fact, it may be the latter group of environmentally-friendly behaviors that leads people to think acting environmentally-friendly threatens well-being. Meaning, on the other hand, is at the core of environmentally-friendly behavior. As acting environmentally-friendly can benefit the quality of nature and the well-being of other people, it can be seen as moral and thereby meaningful behavior (Heberlein, 1972; Leopold, 1949; Thøgersen, 1996). So, while it is other characteristics of specific environmentally-friendly behavior that bring comfort or discomfort, it may be its positive consequences for the environment as such that bring meaning.

In the empirical chapters of this dissertation (Chapters 3, 4 and 5), we studied the extent to which environmentally-friendly behavior can increase well-being by examining the positive emotions that this type of behavior elicits. In Chapter 2, we distinguished between hedonic and eudaimonic well-being as two distinct types of outcomes. Therefore, we set out to examine the influence of environmentally-friendly behavior on two distinct types of positive emotions: hedonic emotions (fleeting positive emotions such as pleasure) and eudaimonic emotions (deeper positive emotions such as feeling meaningful). Based on our reasoning we expected that more environmentally-friendly behavior would elicit especially more eudaimonic emotions, while hedonic emotions were not expected to be consistently linked to the environmentally-friendliness of behavior: it was expected to be other characteristics of environmentally-friendly behavior and not its environmental consequences that make it pleasant or unpleasant. In the empirical chapters of this dissertation, however, we found repeatedly that environmentally-friendly behavior elicited both positive eudaimonic and positive hedonic emotions, suggesting such behavior can elicit a broad range of positive feelings. We therefore came to see meaning as a reason why behavior elicits positive emotions in general, and consequently tested whether the meaning people associate with environmentally-friendly behavior could explain why engagement elicits positive emotions in the empirical chapters. We will further discuss this reasoning under the heading of theoretical implications.

Chapter 3 examined whether environmentally-friendly behavior itself is associated with positive emotions. In Study 3.1 we compared the explicit association people have with behavior that can benefit the environment to the association they have with behavior that can harm the environment. In a scenario study we systematically varied whether the behaviors participants evaluated were environmentally-friendly or environmentally-unfriendly (e.g., washing clothes at a low temperature versus washing clothes at a high temperature; between subjects). We expected that environmentally-friendly behaviors would be seen as more meaningful than environmentally-unfriendly behaviors, and thus that people would anticipate to feel more positive and less negative emotions after engagement in environmentally-friendly behavior, compared to after engagement in its environmentally-unfriendly counterparts. Our results supported this expectation, providing a first indication that people may have a positive association with environmentally-friendly behavior itself. In Study 3.2 we compared the implicit association people have with environmentally-friendly versus neutral words. This way we could establish that the findings in Study 3.1 reflect a positive association with environmentally-friendly behavior, rather than a negative association with environmentally-unfriendly behavior. Furthermore, as people are motivated to be seen as moral (Batson et al., 1999) it may be that the positive association people reported in Study 3.1 was caused by social desirability concerns. To reduce the likelihood of social desirability answering we use an Implicit Association Test (Greenwald et al., 1998) in Study 3.2. The results showed that people also implicitly associate environmentally-friendly words more strongly with positive than with negative emotions compared to neutral words, again supporting a positive emotional association with environmentally-friendly behavior itself is present.

Can the meaning associated with this behavior explain why acting environmentally-friendly feels good?

Chapter 3 confirmed that environmentally-friendly behavior can be associated with positive emotions. Our second aim was to test whether the meaning associated with environmentally-friendly behavior can explain why this link exists. If meaning indeed plays an important role in explaining this relationship, behavior that is perceived to be more meaningful should also elicit more positive emotions.

We tested this reasoning in two different ways. First, we examined the role of meaning by testing its moderating influence on the relationship between environmentally-friendly behavior and positive emotions. Would a positive emotional association with environmentally-friendly behavior be stronger under conditions where the meaning of this behavior was assumed to be higher? Study 3.1 tested several of these conditions, including perceived characteristics of the behavior itself and individual characteristics that may affect how personally meaningful environmentally-friendly behavior is perceived to be. One relevant characteristic of behavior that is likely to affect its

meaning is how environmentally-friendly and thus moral the behavior is perceived to be. As we theorized above, acting environmentally-friendly can be seen as meaningful behavior because of its moral nature: it contributes to the quality of nature and the environment, and the well-being of other people now and in the future. The extent to which behavior is perceived to be environmentally-friendly, therefore, may affect the meaning attributed to this behavior, thereby influencing how good engagement feels. As expected, Study 3.1. indeed showed that people had a stronger positive emotional association with environmentally-friendly (versus environmentally-unfriendly) behaviors when they saw the behaviors included in the study as being more environmentally-friendly.

Furthermore, we examined two relevant individual characteristics that are likely to affect the *personal* meaning people attach to environmentally-friendly behavior: how much people value the environment, and the extent to which they feel morally obliged to engage in environmentally-friendly behavior. As expected, Study 3.1 indeed showed that people had a stronger positive emotional association with environmentally-friendly behavior when they valued the environment more strongly and when they felt more morally obliged to engage in environmentally-friendly behavior. Together, these results suggest that a positive emotional association with environmentally-friendly behavior is stronger in conditions under which the meaning of this behavior was assumed to be higher, that is, when people more strongly care about nature and the environment, and when the behavior is seen as more environmentally-friendly.

Second, we examined the role of meaning by testing its mediating influence on the relationship between environmentally-friendly behavior and positive emotions. Could meaning explain why a positive emotional association with environmentally-friendly behavior would exist? In Chapter 4, we tested our reasoning by explicitly measuring whether behavior that is perceived to be more environmentally-friendly is indeed perceived to be more meaningful, and whether the meaning attributed to this behavior in turn influences the emotions elicited by acting accordingly. As expected, two scenario and one field study showed that the more people perceived behavior to be environmentally-friendly, the more meaningful they deemed this behavior to be. In turn, the more meaningful people deemed behavior to be, the better they expected to feel (Study 4.1 and 4.2) and actually felt (Study 4.3) about engaging in this behavior.

Together these results suggest that the meaning associated with environmentally-friendly behavior can serve as an important explanation for why people feel good about acting this way. We will further discuss this finding under theoretical implications.

Can the self-image behavior elicits explain why acting environmentally-friendly feels good?

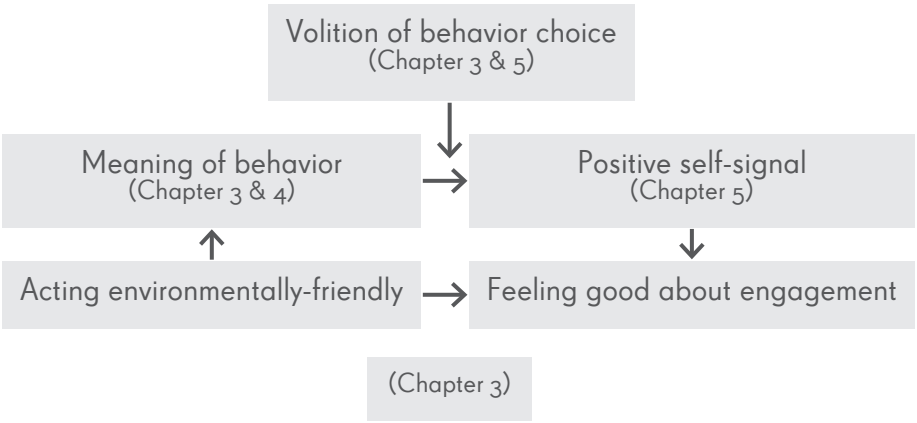
If meaning plays a role in explaining why acting environmentally-friendly feels good, the next question that arises is what leads meaning to have this effect. We theorized in Chapter 2 that engagement in meaningful behavior could elicit positive emotions because this behavior can *signal something positive about who you are*. One of the pillars on which people base their self-image, is their own actions (Bem, 1967; Bem, 1972). How meaningful your behavior is may thereby affect how positive your self-image is (Aquino & Reed, 2002; Dunning, 2007; Sachdeva et al., 2009). If environmentally-friendly behavior is perceived to be meaningful behavior, acting this way may thus boost your self-image, thereby eliciting positive emotions.

Chapter 3 provided a first examination of whether a positive self-signal can explain why doing something meaningful, in this case acting environmentally-friendly, can feel good. We argued that *making the choice* to engage in certain behavior rather than acting out of situational constraints may particularly reveal something about who you are – not only to others, but also to yourself (Bodner & Prelec, 2003). We base our reasoning on Aristotle, who claimed virtuous behavior entails someone doing moral things for the right reasons—the right reasons being that the person is deliberately choosing to act morally rather than doing so out of external temptation or coercion, or out of ignorance (Ryan et al., 2008). This suggests that acting in a meaningful way out of one's own volition may send a stronger positive self-signal and therefore elicit stronger positive emotions than acting this way out of external pressure. Study 3.1 showed that the positive emotional association with environmentally-friendly behavior was indeed stronger when engagement was driven by one's own volition rather than by the situation. This result suggests that the more this behavior reveals something about who you are, the more positive the emotional association with environmentally-friendly behavior is.

In Chapter 5, we further tested our reasoning by explicitly measuring whether acting environmentally-friendly influences how people see themselves and elicits a positive self-image. In Study 5.1 we examined whether engagement in environmentally-friendly behavior reflects on how people see themselves. Our results revealed that environmentally-friendly behavior indeed impacts people's self-image: the more environmentally-friendly products supermarket customers just bought, the more they saw themselves as an environmentally-friendly person. In turn, the more environmentally-friendly their self-image was, the better participants felt about their purchases. Building on this finding, Study 5.2 tested whether environmentally-friendly behavior can actually boost one's self-image as well. Here we showed that participants who thought about environmentally-friendly behaviors they engaged in out of their

own volition saw themselves in a more positive light than participants who thought about environmentally-friendly behaviors they engaged in out of situational constraints. Again, as expected, it was this positive self-image that in turn led people to anticipate feeling better about their behavior. Together these results suggest that acting environmentally-friendly can reflect on who you are and boost your self-image, thereby making environmentally-friendly behavior feel good to engage in.

Figure 1
Theoretical model studied in this dissertation



Theoretical implications

Whether and why environmentally-friendly behavior is a source of well-being

The findings of our empirical chapters have several theoretical implications. Most importantly, our findings add new insights to the literature studying the link between environmentally-friendly behavior and well-being. The main contribution of this dissertation is that it indicates environmentally-friendly behavior *itself* may be a source of well-being, as acting environmentally-friendly can be seen as meaningful behavior and boost one's self-image.

Until now, the link between environmentally-friendly behavior and well-being was typically explained as having an external cause. Instead of environmentally-friendly behavior being the source of well-being, scholars proposed a third variable could explain environmentally-friendly action and increased well-being at the same time (Beavan, 2009; Brown & Kasser, 2005; Csikszentmihalyi, 2000; T. Jackson, 2005; Kasser, 2009). We, however, theorized it may actually be environmentally-friendly behavior itself that makes people feel good. As acting environmentally-friendly can have positive consequences for the quality of nature and the well-being of other people, this behavior can be seen as moral behavior (Heberlein, 1972; Leopold, 1949; Thøgersen, 1996). Perceiving behavior to be beneficial for the environment, therefore, may make such behavior moral and thereby meaningful to engage in, leading acting this way to feel good as well.

We found clear support for this reasoning, as our studies consistently showed that the meaning people associate with this type of behavior is an important reason why acting environmentally-friendly may bring well-being. The more environmentally-friendly and thereby meaningful the behavior itself is perceived to be, and the more personal meaning people attach to environmentally-friendly behavior, the better people (expected to) feel about acting this way. Furthermore, our studies suggest that engagement in meaningful behavior feels good because of its effect on one's self-image. The more environmentally-friendly behavior is perceived to be, the more acting accordingly leads you to see yourself in an environmentally-friendly and positive light, thereby eliciting positive emotions.

Together our findings suggest that not only a third variable can explain why environmentally-friendly action and well-being are linked; environmentally-friendly behavior *itself* may be a source of well-being as well. By demonstrating the important role meaning plays, we add a novel and more direct explanation for why environmentally-friendly behavior and well-being can go together.

Meaning and pleasure may be related

Although we originally set out to examine the influence of environmentally-friendly behavior on two distinct types of positive emotions, we gradually came to see meaning as a reason why behavior elicits a broad range of positive emotions. Over all studies, we found that environmentally-friendly behavior did not only elicit positive eudaimonic emotions, but may give rise to positive hedonic emotions as well. This implies that its environmental consequences not only make environmentally-friendly behavior feel good in a eudaimonic sense, but they can also make this behavior feel good in a in a hedonic sense. This dissertation thus provides further evidence that meaning and pleasure may sometimes be difficult to separate. As some argue, the meaning people attribute to behavior may even be a *source* of pleasure and comfort (see Andreoni, 1989; Andreoni, 1990; Taufik et al., 2015). Future research should study this possible relationship in more detail.

A theoretical question that remains is whether meaning as a factor that affects wellbeing can actually be distinguished from well-being itself. Although we use measures of meaning to explain *why* environmentally-friendly behavior elicits a good feeling, some might argue that meaning *is* a good feeling, and thereby a component (not an antecedent) of well-being. Longitudinal research could partly solve this discussion by finding out whether acting in a meaningful way now is one of the ways to bring well-being later on (meaning as antecedent of well-being), versus whether without experiencing a sense of meaning now, people can never attain well-being later on (meaning as component of well-being). As the nature of the relationship between meaning and well-being is for a large part a theoretical question, however, longitudinal data could

never provide a definite answer. If one reasons experiencing meaning is a key factor of being well, finding out that people can attain well-being without experiencing meaning would not prove meaning is an antecedent (not a component) of well-being; such a finding would only show that we have been using the wrong measures of well-being all along.

Practical implications

Not only do the findings of our empirical chapters lead to new theoretical insights, they also have several practical implications. As illustrated by the quote "The American way of life is not up for negotiations" by former U.S. president George H.W. Bush prior to the Earth Summit in Rio de Janeiro, many policy makers still believe that engaging in environmentally friendly behavior requires sacrificing personal well-being. Building on prior literature, our results however show that this belief may be erroneous: our participants rather associated environmentally-friendly behavior with positive emotions. The findings in this dissertation show that people see environmentally-friendly behavior as meaningful behavior exactly because of its positive consequences for the environment, and thereby (expect to) feel good about acting accordingly. If governments' long-term goal is to improve environmental quality and individual well-being at the same time, decreasing or downplaying discomfort should thus not be the sole focus when promoting environmentally-friendly behavior (L. Evans et al., 2013; Thøgersen, 2013). Focusing on those personal and behavioral aspects that make environmentally-friendly behavior more meaningful to engage in could provide to be a fruitful alternative direction.

Increase the clarity of behavior's meaning

We found that people come to see their own actions as more meaningful when those actions are perceived to be better for the environment. Since environmental impact depends on multiple dimensions, however, it is not always clear how environmentally-friendly specific behaviors are. For instance, although buying products that are produced locally is an often used strategy to reduce one's environmental impact, it is not always true that foreign produce is more environmentally harmful than local produce (Milieu Centraal, November, 2012). Especially for laypeople, it may therefore be difficult to pinpoint which behavior harms the environment the least. Not knowing how environmentally-friendly one's behavior is may, according to this thesis, take away from the meaning people could associate with this behavior, and thereby from the good feeling engaging in this behavior brings. Enhancing awareness of the positive impact of one's behavior may therefore be an important way to optimize how people feel about acting this way (Aknin et al., 2013). Clear and trustworthy

communication may help to increase awareness of the environmental impact of relevant behaviors, leading people to feel good about engaging in those behaviors that benefit the environment.

Increase the strength of the positive self-signal behavior sends

As our findings suggest, how behavior reflects on you personally also affects how you feel about acting accordingly. Increasing the extent to which positive behavior, such as acting environmentally-friendly, reflects on you may boost your self-image and thereby increase the well-being this behavior brings. As our studies show, volition of choice may be a factor influencing how strongly behavior reflects on its actor. Participants who thought about environmentally-friendly actions they engaged in out of their own volition saw themselves in a more positive light than participants who thought about actions they engaged in out of situational constraints. *Making the choice* to act environmentally-friendly, therefore, seems to be an important condition for enhancing how good people feel about this action. That does not necessarily entail, however, that all governmental interventions coercing people to act environmentally-friendly are abolished in order for people to feel good about themselves and their behavior. Rather, in addition to considering whether the policy is effective in promoting the target behavior, policy makers should also take into account whether it allows people to attribute the choice for doing the target behavior to their own volition.

An interesting case in this respect is the use of "nudges", an often discussed policy instrument nowadays. A nudge refers to "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives" (Thaler & Sunstein, 2008, p. 6). Examples of this type of intervention in the environmental domain would be to place environmentally-friendly products on eye level in a supermarket, or to make a "green" behavior the default option (Ebeling & Lotz, 2015). Such nudges are believed to leave individuals' sense of autonomy intact. Consequently, when nudged to act environmentally-friendly, people may not see the nudge but rather their own volition as the reason for their action, allowing them to feel good about acting this way.

However, one can wonder whether people indeed necessarily feel in charge of their decision to engage in certain behavior when motivated to do so by a nudge. Hansen and Jespersen (Hansen & Jespersen, 2013) argue that there are two type of nudges: those that motivate engaging in behavior by influencing reflective thinking and those that motivate engaging in behavior by influencing automatic thinking. An example of the first type of nudge would be to place environmentally-friendly products on eye level, as mentioned above. In this intervention conscious attention is drawn to environmentally-friendly products and people then *choose* to purchase them. This indeed seems to fit the image of nudges as ways to motivate action without restricting autonomy – thereby allowing people to feel their behavior was volitional.

An example of the second type of nudge would be to use smaller plates to discourage overconsumption (Van Ittersum & Wansink, 2012). In this case, the use of smaller plates makes people eat less *without them consciously being aware of this*. With this type of nudge people may not know they eat smaller portions, let alone perceive this as a choice they made themselves. If people act environmentally-friendly based on the second type of nudge, the good feeling this behavior could have elicited may therefore be lost. Not only does the good behavior say little about who they are, actors may not even be aware of the fact they are doing something environmentally-friendly and thus meaningful. Explicitly letting people know that they chose to act environmentally-friendly *after the fact* may be helpful to solve these problems, and increase both the awareness and the self-signaling effect of behaviors nudged in this way.

Advertise environmentally-friendly behavior as behavior that can make you feel good?

A practical implication that might be tempting to draw from the current dissertation is that one could promote environmentally-friendly action by referring to its positive effects on personal well-being. The first commercials using this link already exist: a large Dutch supermarket chain for instance recently promoted their organic produce with the slogan "The good feeling of organic". However, there is a practical consideration that might speak against this approach. It is namely unclear whether people would still feel good about their meaningful and virtuous behavior if they engage in it *with the explicit and sole purpose to feel good*. As we already mention above, Aristotle's view on meaning entails someone doing virtuous things for the right reasons—the right reasons being that the person is deliberately choosing to act this way and is not doing so out of external temptation or coercion, or out of ignorance (Ryan et al., 2008). Engaging in virtuous behavior *solely because* this behavior is expected to make you feel good, and not because it is the right thing to do, may therefore not be very meaningful in Aristotle's eyes.

Whether and when striving towards becoming happier actually contributes to well-being, is debated in the current literature. Some preliminary studies show that telling people good behavior makes you feel better does not necessarily detract from the behaviors' actual effect on how good they feel (Anik, Aknin, Norton, & Dunn, 2009). Believing certain behavior can contribute to your well-being may actually be part and parcel of what leads this behavior to have an effect on well-being (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011). Others, however, argue that true happiness cannot be found by focusing on getting it. According to this line of reasoning, happiness is always a byproduct of personal devotion to something larger than ourselves and being fully involved in the life we live (Csikszentmihalyi, 1992). Future research is necessary to study the effectiveness of directly striving towards happiness in general. Yet, results of the current dissertation suggests that acting environmentally-friendly

to feel good, and not to do something meaningful, may not have the desired effect. As we reason in Chapter 2 and show in Chapters 3 and 4, the meaning people associate with the behavior is an important aspect of why engagement in environmentally-friendly behavior feels good. In order for environmentally-friendly behavior to feel good, it should therefore be clear to people that this behavior is meaningful to do. When focusing on self-interest, such as how engagement would make you feel, the notion that this behavior is virtuous and meaningful may be pushed into the background. Ironically, this may even prevent the promised well-being from being elicited. By only focusing on the positive emotions you will feel when acting environmentally-friendly, the precise source of these positive emotions – the idea that you are doing something virtuous and meaningful – is namely missing.

Future research

The current dissertation focused on whether, why and under which circumstances environmentally-friendly behavior contributes to well-being. Our results highlight the importance of meaning in answering these questions, but they also raise new questions that need to be addressed in future research. Some of these questions were already discussed under the heading of theoretical and practical implications. In this section we focus on what we think are the two most important directions for future research.

Further exploration of the model studied in this dissertation

The findings in this dissertation suggest that environmentally-friendly behavior can elicit positive emotions. Furthermore, meaning and the positive self-signal environmentally-friendly behavior thereby sends, can together serve as an explanation for why engagement in this type of behavior can feel good (see Figure 1). The different chapters of this dissertation study and give support for separate parts of our theoretical model. The full model, however, has not been tested yet. Most importantly, while theoretically there is a clear link between the meaning associated with behavior and the positivity of the self-signal engagement in this behavior sends, we did not study this link explicitly in the current dissertation. Future research could therefore test whether it is indeed the meaning associated with behavior that makes acting this way reflect positively on who you are.

Follow-up research could further develop the model we propose in this dissertation as well. A first direction would be to further examine whether all environmentally-friendly behavior translates into perceived meaning and positive emotions, or whether these results depend on characteristics of the specific environmentally-friendly behavior under study. For instance, the behaviors we studied (e.g. recycling)

were probably not perceived to be very aggravating. We can therefore not determine whether the meaning people attribute to behavior always translates in positive emotions, or whether this relationship is only found when meaningful behavior is not too uncomfortable to engage in. An interesting question for future research would therefore be how the relationship in our model depend on characteristics of specific environmentally-friendly behavior – factors that are unrelated to the behaviors' impact on the environment itself.

A second direction would be to further examine what makes environmentally-friendly behavior (personally) meaningful. In the current thesis we mainly focus on aspects of the behavior itself that make it meaningful, following the reasoning that its positive consequences for the environment and future generations are a source of meaning for environmentally-friendly behavior. As we already suggest in Study 3.1, however, individual differences may also influence the extent to which environmentally-friendly behavior is *personally* meaningful. Testing the influence of various individual characteristics in a more systematic way, and studying other factors that make this behavior more meaningful for certain individuals could provide to be a fruitful deepening of our reasoning. Following our reasoning, an interesting additional factor to study would be the extent to which people believe climate change is real and human actions influence environmental conditions. If people do not believe there are environmental problems, or do not believe human actions affect the environment, they should also perceive environmentally-friendly behavior to have little positive consequences for nature or other people. For these people, engagement in environmentally-friendly behavior may therefore be less meaningful and elicit less positive feelings. As a first indication of this process, our results in Study 4.1 suggest that believing you can personally contribute to improving environmental quality by engaging in specific behavior indeed relates to seeing this behavior as more meaningful and feeling better about acting accordingly. Future research could study whether believing human action is necessary and effective in benefitting the environment in general influences the meaning and emotions elicited by environmentally-friendly behavior in a similar way.

A third direction would be to study alternative relationships between the factors in our model. The extent to which voluntary action influences other factors than just the relationship between meaning and a positive self-image would be of specific interest. For instance, an important stance in theoretical considerations about morality is that "decisions are classified as moral only when the person who makes them is perceived to be the responsible agent, that is, to have chosen the action knowingly and willingly when he could have done otherwise" (Heberlein, 1972, p. 81). Following this reasoning, behavior would only be moral and thus meaningful if engagement can be attributed to one's own volition. Besides influencing to what extent meaningful

behavior leads to a positive self-image, as we test in our current model, volitional or non-volitional engagement may thus also influence the meaning attributed to behavior itself. By testing such alternative relationships between the factors in our model, future research may gain new and promising insights.

What are the long-term effects of the good feeling environmentally-friendly behavior could elicit?

The current dissertation focused on whether, why and under which circumstances environmentally-friendly behavior makes people feel good. Another relevant question for future research is what happens afterwards: what are the long-term effects of feeling good by doing good for the environment? Do the positive emotions environmentally-friendly action elicits translate into long-term well-being for those who engage in these actions? And are there, besides the individual well-being benefits, also long-term societal benefits gained from the good feeling engagement in environmentally-friendly behavior can bring?

On the basis of the processes we studied in the current dissertation, we would expect environmentally-friendly behavior does not only elicit positive emotions, but also leads to long-term individual well-being benefits. As mentioned at the beginning of our introduction, various scholars have suggested and shown that environmentally-friendliness and well-being are linked (Brown & Kasser, 2005; Helliwell et al., 2012; Kasser & Sheldon, 2002; Welsch & Kühling, 2011; Xiao & Li, 2011). As these correlational studies suggest, long-term well-being and acting environmentally-friendly can thus go together. The main question to be answered, however, was *why* this relationships exists. In the current dissertation we show that the meaning people attribute to environmentally-friendly behavior may be what makes this type of behavior feel good right away. The meaning this type of behavior brings may therefore also be part of why acting environmentally-friendly is related to overall well-being. Future longitudinal research is necessary to test whether and how the meaning associated with current environmental actions translates into long-term well-being as well. As environmentally-friendly behavior is not the only type of behavior that can be perceived as meaningful, and meaningful behavior is not the only factor influencing long-term well-being, however, it may be challenging to disentangle these long-term effects.

To what extent the good feeling acting environmentally-friendly brings also translates into future virtuous behavior – thereby leading to long-term societal benefits – is debated in different lines of research. The first line of research, studying moral licensing, would suggest a good feeling would not necessarily initiate a chain of further good behaviors. As this literature argues, when the need to see yourself in a positive light is fulfilled by one good action, there is no immediate reason to engage in further good but costly behavior. Rather, engagement in moral behavior now can lead to less

moral behavior on a later occasion (Sachdeva et al., 2009). Especially if engagement in moral behavior involves doing something unpleasant, the desire to stay in a positive mood may hamper following moral behavior (Isen & Simmonds, 1978). Some studies even suggest that it is a positive mood itself that leads to immoral behavior, by providing the cognitive flexibility necessary to rationalize immorality (Vincent, Emich, & Goncalo, 2013). This line of research would therefore suggest that the positive well-being effect of engagement in environmentally-friendly behavior does not necessarily translate into long-term benefits for society, and may even damage it.

Opposite to this line of research, however, stand findings that support Bertrand Russell: "The good life, as I conceive it, is a happy life. I do not mean that if you are good you will be happy; I mean that if you are happy you will be good" (Russell, 1951). For instance, the affect heuristic (Slovic, Finucane, Peters, & MacGregor, 2007; Smith et al., 1994) would suggest that the feelings people associate with behavior would guide their actions. If engagement in environmentally-friendly behavior feels good, people would thus be expected to act environmentally-friendly again on a later occasion, as their previous experience may lead them to anticipate they will feel good again. On a larger scale, the broaden-and-build model of positive emotions (Fredrickson, 2001; Fredrickson, 1998) suggests that positive emotions broaden "people's momentary thought-action repertoires". More precisely, positive emotions allow people to become more creative, knowledgeable, resilient, socially integrated and healthy over time – as some argue, opening the way for virtuous behavior (Kesebir & Diener, 2013). As research indeed shows, doing good does not only feel good, people who feel good are also more likely to engage in good behavior (Aknin et al., 2012; Lyubomirsky, King, & Diener, 2005; Manucia, Baumann, & Cialdini, 1984). This line of reasoning would therefore suggest that the positive well-being effect of engagement in environmentally-friendly behavior do spark future virtuous behavior, thereby bringing long-term benefits for society. An important question to answer therefore is when such a virtuous cycle is put in motion. In other words, when will the good feeling virtuous behavior brings motivate people to behave virtuously again, and when will it motivate them to behave counter-virtuously? Future longitudinal research should provide an answer to these questions.

Conclusion

Engagement in environmentally-friendly behavior may sometimes be costly, uncomfortable and frustrating, thereby seen as sacrificing well-being. The current dissertation however shows there is also a different, more positive side to this type of behavior: environmentally-friendly may also enhance well-being. Since environmentally-friendly behavior can be seen as meaningful behavior, engagement may reflect positively on who you are – particularly when you act out of your own volition. Thereby, in as far as environmentally-friendly behavior is seen as meaningful behavior, acting accordingly can feel good as well.

In that sense, the effect of environmentally-friendly behavior on well-being may be compared to that of other behaviors that are not always pleasant, but can bring great meaning – for example, having a child. Having a child can be costly, uncomfortable and frustrating, and on top of that fill you with worries. On the other hand, parents always assure "you also gain a lot in return". The enjoyable moments and the meaning connecting to something/someone other than yourself brings can feel great (Haidt, 2006; Leary, 2004; Wayment & Bauer, 2008), even though having children overall may have a slightly negative effect on well-being (Alesina, Di Tella, & MacCulloch, 2004). As these cases illustrate, actions do not have to only be fun to be able to contribute to well-being. I am sure most parents would not want to miss out on the positive experiences their children bring, even if that would mean higher overall well-being. Why should that be any different for environmentally-friendly behavior?

Nederlandse samenvatting

Het beschermen en verbeteren van de milieukwaliteit is een belangrijke doelstelling voor overheden in de nabije toekomst. Zoals bijvoorbeeld afgesproken in het klimaatakkoord in Parijs moet de opwarming van de aarde ruim onder de twee graden blijven ten opzicht van de temperatuur voor de industriële revolutie (European Commission, December 23, 2015). Ook het vergroten van het geluk van hun burgers heeft prioriteit voor veel overheden. Volgens het World Happiness Report wordt geluk steeds vaker gezien als een goede maatstaf voor sociale vooruitgang en daarmee een na te streven doel voor beleid. Een groeiend aantal overheden maakt dan ook gebruik van kennis over wat mensen gelukkig maakt bij het maken van beleid (Helliwell et al., 2012).

Het verbeteren van de milieukwaliteit en het vergroten van geluk lijken op het eerste gezicht twee verschillende en misschien zelfs tegenovergestelde doelen. Het doen van iets milieuvriendelijks kan namelijk duurder, moeilijker en oncomfortabeler zijn dan het laten van dit gedrag, en daarom afbreuk doen aan geluk. In het huidige proefschrift beargumenteren we echter dat deze doelen niet noodzakelijkerwijs conflicteren. Sterker nog, de studies uit dit proefschrift hebben tot doel om na te gaan of milieuvriendelijk handelen juist kan bijdragen aan persoonlijk geluk en zo ja, waarom dit het geval is.

Hoewel eerder onderzoek al laat zien dat milieuvriendelijk gedrag en geluk kunnen samengaan (Brown & Kasser, 2005; Kasser & Sheldon, 2002; Xiao & Li, 2011), is er nog maar weinig bekend over *waarom* en *onder welke omstandigheden* dit het geval is. Tot nu toe werd deze relatie vaak verklaard door te verwijzen naar externe factoren. Individuele verschillen, zoals hoe mindful iemand is, kunnen er bijvoorbeeld voor zorgen dat mensen zowel milieuvriendelijker handelen als gelukkiger zijn (Brown & Kasser, 2005). Daarnaast blijken activiteiten die tot geluk leiden, zoals persoonlijke groei of sociale relaties, 'toevallig' ook vaak duurzaam te zijn (T. Jackson, 2005; Kasser, 2009). In dit proefschrift vragen we ons af of alleen factoren buiten het gedrag zelf kunnen verklaren waarom milieuvriendelijk gedrag en geluk samengaan. Kan milieuvriendelijk gedrag *zelf* niet ook een bron van geluk zijn?

In Hoofdstuk 2 geven we een theoretisch antwoord op deze vraag en gaan in op waarom er een positieve relatie tussen milieuvriendelijk gedrag en geluk zou kunnen bestaan. Hier beargumenteren we dat het belangrijk is om een verschil te maken tussen geluk dat gebaseerd is op welbehagen (*hedonisme*) en geluk dat gebaseerd is op betekenis (*eudaimonia*). Alhoewel sommige milieuvriendelijke gedragingen erg comfortabel kunnen zijn, zoals een fietstochtje op een mooie lentedag, zijn andere milieuvriendelijke gedragingen juist oncomfortabel, zoals een koude douche in de winter. Dit suggereert dat geluk gebaseerd op welbehagen geen eenduidige relatie met milieuvriendelijkheid zal hebben; het is niet de milieuvriendelijke aard van het

gedrag zelf, maar andere kenmerken van milieuvriendelijk gedrag die voor welbehagen zorgen. Dit is echter anders voor geluk gebaseerd op betekenis. De betekenis die we toekennen aan milieuvriendelijk gedrag kan namelijk direct voortkomen uit het feit *dat* het gedrag goed is voor het milieu. Veel mensen geloven dat zij moreel verplicht zijn om de natuur te beschermen (Leiserowitz et al., 2005; Lorenzoni et al., 2007). Vanwege de positieve gevolgen die dit gedrag kan hebben voor het welzijn van andere mensen nu en in de toekomst wordt milieuvriendelijk gedrag gezien als moreel en daarmee betekenisvol gedrag (Feinberg & Willer, 2012; Thøgersen, 1996). Weten dat het goed is voor het milieu kan dus één van de factoren zijn die gedrag betekenisvol maakt. Geluk gebaseerd op het ervaren van betekenis lijkt daarom een eenduidige link met milieuvriendelijkheid te hebben; de milieuvriendelijke aard van het gedrag zelf kan voor betekenis zorgen.

Samenvatting van de belangrijkste resultaten

Hebben mensen een positieve associatie met milieuvriendelijk gedrag?

In de empirische hoofdstukken van dit proefschrift (Hoofdstuk 3, 4 en 5) onderzochten we de rol die betekenis speelt voor de relatie tussen milieuvriendelijk gedrag en geluk in meer detail. We keken specifiek of milieuvriendelijk gedrag *zelf* positieve emoties oproept, en of deze emoties inderdaad voortkwamen uit de betekenis die dit gedrag kan geven. In Hoofdstuk 3 verkenden we de emotionele associatie die mensen hebben met milieuvriendelijk gedrag. Studie 3.1 richtte zich op de expliciete emotionele associatie die mensen hebben met milieuvriendelijk gedrag. Een scenario studie liet zien dat mensen inderdaad verwachtten meer positieve en minder negatieve emoties te ervaren na het vertonen van milieuvriendelijk gedrag (bijvoorbeeld afval scheiden) dan na het vertonen van milieuonvriendelijk gedrag (bijvoorbeeld alle typen afval in één container gooien). In Studie 3.2 bouwden we voort op deze bevindingen en keken naar de impliciete associatie die mensen hebben met milieuvriendelijk gedrag. Uit een Impliciete Associatie Test (Greenwald et al., 1998) bleek dat positieve en milieuvriendelijke woorden ook onbewust aan elkaar gelinkt worden. Er lijkt dus inderdaad een positieve emotionele associatie met milieuvriendelijk gedrag te bestaan, die niet verklaard lijkt te worden door sociaal wenselijk antwoordgedrag.

Kan de betekenis die milieuvriendelijk gedrag heeft verklaren waarom het doen van dit gedrag goed voelt?

Nadat we hadden vastgesteld dat milieuvriendelijk gedrag zelf positieve emoties oproept, wilden we ook inzicht krijgen in *waarom* dit het geval is. Als betekenis inderdaad een belangrijke rol speelt, zou gedrag dat als betekenisvoller gezien wordt ook meer positieve emoties moeten oproepen. In Studie 3.1 testten we deze redena-

tie door te kijken naar het effect dat verschillende indicatoren van betekenis hadden op een positieve associatie met milieuvriendelijk gedrag. Onze resultaten lieten zien dat zowel de betekenis van het gedrag zelf als de mate waarin gedrag persoonlijk betekenisvol is, invloed hadden op de emotionele associatie die mensen hebben met milieuvriendelijk gedrag. Hoe milieuvriendelijker mensen dachten dat gedrag was, en hoe belangrijker ze het milieu en milieuvriendelijk handelen vonden, hoe sterker de positieve associatie die mensen hadden met milieuvriendelijk gedrag.

Voortbouwend op deze bevindingen onderzochten we de rol van betekenis expliciet in Hoofdstuk 4. In twee scenariostudies en een veldstudie lieten we zien dat naarmate mensen dachten dat gedrag een grotere bijdrage leverde aan de milieukwaliteit, ze dit gedrag ook als betekenisvoller ervoeren. Verder bleek de betekenis die mensen aan het gedrag toekenden op haar beurt ook een positieve invloed te hebben op hoe goed ze zich verwachtten te voelen (Studie 4.1 en 4.2) en hoe goed ze zich daadwerkelijk voelden (Studie 4.3) over het doen van dit gedrag. Samen wijzen deze studies erop dat betekenis inderdaad een belangrijke verklaring kan zijn voor waarom milieuvriendelijk gedrag positieve emoties kan oproepen.

Kan de invloed die betekenisvol gedrag heeft op je zelfbeeld verklaren waarom het doen van dit gedrag goed voelt?

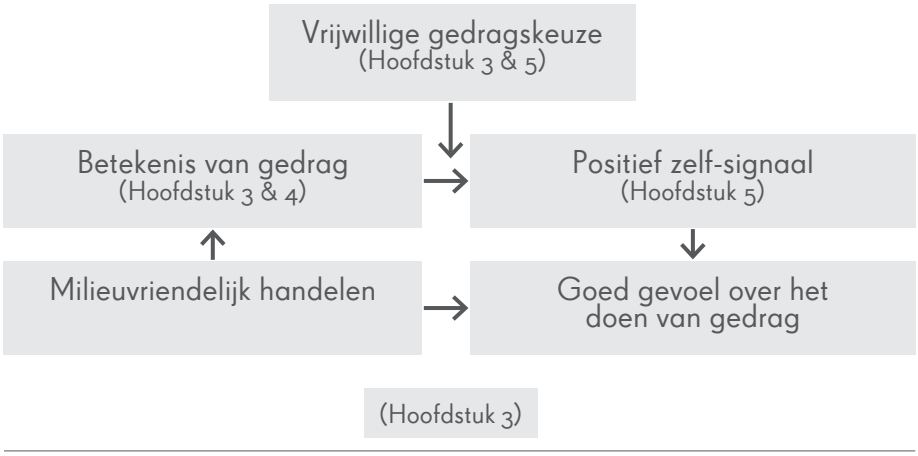
Als de betekenis die dit gedrag geeft een verklaring is voor waarom het doen van iets milieuvriendelijks goed voelt, roept dat ook een vervolgvraag op: waarom voelt betekenisvol gedrag goed? We beredeneerden in Hoofdstuk 2 dat het doen van iets betekenisvols goed kan voelen omdat dit gedrag iets positiefs kan zeggen over degene die dit gedrag vertoont. Mensen ontlenen het beeld dat ze van zichzelf hebben onder andere aan hun eigen gedrag (Bem, 1967; Bem, 1972). Milieuvriendelijk handelen kan er bijvoorbeeld voor zorgen dat mensen zichzelf zien als een milieuvriendelijk persoon (Cornelissen et al., 2008; Van der Werff et al., 2014b). Volgens dezelfde redenering kan "goed" gedrag, zoals het doen van iets milieuvriendelijks, een boost geven aan iemands zelfbeeld: het laat je zien dat je een goed persoon bent. Het hebben van zo'n positief zelfbeeld is volgens velen een belangrijke voorwaarde voor geluk (Baumeister, 1993; Taylor & Brown, 1988). Het positieve effect dat betekenisvol gedrag heeft op iemands zelfbeeld (een positief zelf-signaal) zou dus kunnen verklaren waarom het doen van dit gedrag een goed gevoel geeft. Gebaseerd op deze redenering verwachten we dat factoren die invloed hebben *op de mate waarin* milieuvriendelijk gedrag iets over jezelf zegt, ook invloed hebben op hoe goed mensen zich voelen over het doen van dit gedrag. In dit proefschrift hebben we naar één zo'n factor in het bijzonder gekeken: hoe vrijwillig de keuze voor het gedrag was.

Wij veronderstellen dat *vrijwillig kiezen* voor bepaald gedrag meer zegt over wie je bent dan het doen van ditzelfde gedrag omdat de situatie geen andere optie biedt,

bijvoorbeeld omdat de milieuvriendelijke variant het enig overgebleven product in het schap is. Iets betekenisvols doen omdat je dat zelf wil, zou daarom een sterker en positiever zelf-signaal moeten sturen dan het doen van ditzelfde gedrag omwille van de situatie. Studie 3.1 liet zien dat een positieve emotionele associatie met milieuvriendelijk gedrag inderdaad sterker was voor vrijwillig gekozen gedrag, dan voor gedrag dat gedaan werd omdat de situatie geen andere optie biedt. Hoe meer mensen de keuze voor milieuvriendelijk gedrag aan zichzelf kunnen toeschrijven, hoe sterker ze dit gedrag associëren met positieve emoties.

Hoofdstuk 5 bouwt voort op dit resultaat. Studie 5.1 liet zien dat het kopen van milieuvriendelijke producten inderdaad invloed heeft op hoe mensen zichzelf zien. Hoe meer milieuvriendelijke producten ze gekocht hadden, hoe meer mensen zichzelf zagen als een milieuvriendelijk persoon. Dit zelfbeeld had op zijn beurt invloed op hoe mensen zich over hun gedrag voelden: hoe milieuvriendelijker mensen zichzelf zagen, hoe beter ze zich voelden over hun aankopen. In overeenstemming met onze redenering illustreert Studie 5.2 verder dat mensen zichzelf ook algemeen als "beter" persoon zagen na het doen van iets milieuvriendelijks – een effect dat afhangt van in hoeverre dit gedrag iets over jezelf zegt. Mensen die zojuist hadden aangegeven hoe vaak ze vrijwillig iets milieuvriendelijks doen vonden dat dit gedrag sterker reflecteerde dat ze een goed persoon waren, dan mensen die zojuist hadden aangegeven hoe vaak ze iets milieuvriendelijks doen omwille van de situatie. Zoals verwacht was het ook deze keer het positieve zelfbeeld dat op zijn beurt invloed had op hoe mensen zich verwachtten te voelen over het doen van milieuvriendelijke gedragingen. Samen suggereren deze studies dat het doen van iets milieuvriendelijks iemands zelfbeeld een boost kan geven, en dat zorgt op zijn beurt er voor dat mensen zich goed voelen over het doen van dit gedrag.

Figuur 1. Theoretisch model getoetst in dit proefschrift



Theoretische implicaties en vervolgonderzoek

Onze bevinding dat milieuvriendelijk gedrag zelf een bron van geluk kan zijn omdat het betekenis geeft, levert een belangrijke bijdrage aan de literatuur die de relatie tussen milieuvriendelijk gedrag en geluk bestudeert. Tot nu toe werd de relatie tussen milieuvriendelijk gedrag en geluk vaak verklaard door te verwijzen naar factoren buiten het gedrag (Beavan, 2009; Brown & Kasser, 2005; Csikszentmihalyi, 2000; T. Jackson, 2005; Kasser, 2009). Wij beargumenteerden echter dat milieuvriendelijk gedrag *zelf* een goed gevoel kan geven. Omdat het positieve gevolgen heeft voor het milieu en toekomstige generaties kan dit gedrag als moreel en daarom betekenisvol gezien worden (Heberlein, 1972; Leopold, 1949; Thøgersen, 1996), waardoor het doen van dit gedrag goed voelt. Onze studies laten consistent zien dat de betekenis die mensen toeschrijven aan dit type gedrag een belangrijke reden is voor waarom milieuvriendelijk gedrag positieve emoties oproept en gelukkig kan maken. Hoe milieuvriendelijker en daardoor betekenisvoller het gedrag is, hoe beter mensen zich (verwachten te) voelen over het doen van dit gedrag. Verder laten onze studies zien dat het doen van iets betekenisvols goed kan voelen omdat het invloed heeft op iemands zelfbeeld. Hoe milieuvriendelijker gedrag is, hoe positiever dit gedrag op mensen afstraalt, en hoe beter ze zich er dus over voelen. Samen wijzen onze bevindingen erop dat niet alleen externe factoren kunnen verklaren waarom milieuvriendelijk gedrag en geluk gerelateerd zijn; milieuvriendelijk gedrag kan *zelf* ook een bron van geluk zijn. Door te laten zien dat betekenis een belangrijke rol speelt, voegen we een nieuwe en meer directe verklaring toe voor waarom milieuvriendelijk gedrag en geluk samen kunnen gaan.

Een tweede bijdrage van dit proefschrift is dat het illustreert dat welbehagen en betekenis met elkaar samenhangen. Uit onze studies blijkt dat milieuvriendelijk gedrag niet alleen positieve eudaimonische, maar ook hedonische emoties oproept, omdat dit gedrag als betekenisvol gezien wordt. Zoals sommigen redeneren wordt betekenisvol gedrag mogelijk zelfs behaaglijk en comfortabel gevonden juist *omdat* het betekenisvol is (zie ook Andreoni, 1989; Andreoni, 1990; Taufik et al., 2015). Toekomstig onderzoek moet uitwijzen of een dergelijke relatie tussen welbehagen en betekenis bestaat.

Onze bevinding dat milieuvriendelijk gedrag gelukkig kan maken omdat dit gedrag betekenis geeft, roept belangrijke vragen op voor vervolgonderzoek. Zo zou toekomstig onderzoek ons volledige model (zie Figuur 1) kunnen testen, en in meer detail bestuderen of het inderdaad de betekenis van gedrag is die ervoor zorgt dat het doen van dit gedrag een positief zelf-signaal oplevert. Daarnaast blijft het een belangrijke vraag hoe kenmerken van specifiek milieuvriendelijk gedrag – kenmerken die niet gerelateerd zijn aan de milieu impact van dit gedrag – gerelateerd zijn aan de con-

cepten in ons model. Omdat de gedragingen in onze studies niet bijzonder vervelend of moeilijk waren, kunnen we bijvoorbeeld niet concluderen dat de betekenis die gedrag geeft zich altijd vertaalt in een goed gevoel, of dat deze relatie alleen gevonden wordt als gedrag niet al te oncomfortabel is. Longitudinaal onderzoek zou verder kunnen kijken naar de lange termijn effecten van het goede gevoel dat milieuvriendelijk gedrag geeft. Worden mensen ook op de lange termijn gelukkiger van milieuvriendelijk gedrag? En zorgt het goede gevoel dat milieuvriendelijk gedrag geeft ervoor dat mensen meer of juist minder moreel gedrag vertonen op een later moment?

Praktische implicaties

De resultaten van dit proefschrift bieden niet alleen nieuwe theoretische inzichten, maar hebben ook verschillende praktische implicaties. Zoals de uitspraak "Over de Amerikaanse manier van leven valt niet te onderhandelen" die voormalig president George H.W. Bush deed voorafgaand aan de Earth Summit in Rio de Janeiro laat zien, geloven veel beleidsmakers nog steeds dat milieuvriendelijk gedrag betekent dat mensen persoonlijke geluk moeten opofferen. Voortbouwend op eerdere bevindingen, laten onze resultaten echter zien dat dit niet waar hoeft te zijn. Zoals dit proefschrift laat zien voelen mensen zich ook goed over het doen van iets milieuvriendelijks omdat dit gedrag gezien wordt als betekenisvol, juist omdat het goed voor het milieu is. Als overheden op de lange termijn zowel de milieukwaliteit als persoonlijk geluk willen vergroten, zou de focus tijdens het promoten van milieuvriendelijk gedrag daarom niet alleen moeten liggen op het verminderen van mogelijk persoonlijk ongemak (L. Evans et al., 2013; Thøgersen, 2013). Dit proefschrift laat zien dat er een waardevolle alternatieve richting bestaat: een focus op de persoonlijke- en gedragsaspecten die milieuvriendelijk gedrag betekenisvoller maken.

Een eerste aspect waar men zich op kan richten, is via interventies duidelijker maken wat de milieu impact is van verschillende gedragingen. Zoals onze resultaten laten zien voelden mensen zich beter over gedrag naarmate ze het als milieuvriendelijker zagen, omdat milieuvriendelijker gedrag als betekenisvoller werd ervaren. In het dagelijks leven is het echter lang niet altijd evident hoe milieuvriendelijk specifiek gedrag is. Als mensen niet weten dat hun gedrag milieuvriendelijk is, zien ze dit gedrag ook als minder betekenisvol, waardoor het minder waarschijnlijk is dat dit gedrag een goed gevoel oplevert. Duidelijke en betrouwbare informatie over de milieu impact van gedrag is nodig om dit gebrek aan kennis weg te nemen, en kan ervoor zorgen dat mensen die daadwerkelijk milieuvriendelijk handelen zich ook goed voelen over het doen van dat gedrag.

Een tweede aspect waar men zich op kan richten, is hoe het doen van iets milieuvriendelijks afstraalt op degene die dit gedrag vertoont. Zoals onze resultaten laten zien voelden mensen zich beter over hetzelfde milieuvriendelijke gedrag naarmate het meer over hen zegt. Dit hoeft echter niet te betekenen dat alle overheidsinterventies die milieuvriendelijk gedrag stimuleren (en daarmee dus in meer of mindere maten ingrijpen in vrije keuze) afgezworen moeten worden. Tijdens het maken van beleid kan namelijk, naast de effectiviteit van de interventie zelf, ook de mate waarin mensen het gedrag aan zichzelf kunnen toeschrijven in overweging worden genomen. Het gebruik van 'nudges' is in dit geval een interessante casus. Sommige nudges stimuleren dat mensen een bewuste keuze maken voor het gewenste gedrag, zoals het op ooghoogte plaatsen van milieuvriendelijke producten. Andere nudges stimuleren echter een onbewuste keuze voor het gewenste gedrag, zoals kleinere borden die ervoor zorgen dat mensen minder eten. Bij deze tweede vorm van nudges zijn mensen zich niet bewust van hun gedragsverandering, laat staan dat ze hun keuze voor dit nieuwe gedrag zien als een die ze zelf hebben gemaakt. Het gebruik van de eerste vorm van nudges verdient, tenminste als het mede tot doel heeft een gedragskeuze iets te laten zeggen over de consument zelf, daarom de voorkeur.

Conclusie

Het doen van iets milieuvriendelijks kan soms duurder, moeilijker en oncomfortabeler zijn dan het laten van dit gedrag en daarom wordt milieuvriendelijk gedrag geassocieerd met het opofferen van geluk. Dit proefschrift laat echter zien dat dit niet per se het geval hoeft te zijn: het doen van iets milieuvriendelijks kan mensen ook een goed gevoel geven. Omdat milieuvriendelijk gedrag betekenisvol gevonden kan worden straalt het doen van dit gedrag positief af op wie je bent, vooral als je het doet omdat je dat zelf wil. Hoe betekenisvoller dit gedrag wordt gevonden, hoe "brighter the look on an environmentally-friendly life" dus is.

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