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THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

Affect and Pro-environmental Behavior in Everyday Life

Megan Joan Bissing-Olson

Bachelor of Arts, Master of Science

A thesis submitted for the degree of Doctor of Philosophy at

The University of Queensland in 2015

School of Psychology

Abstract

Emotions can be important triggers of a variety of behaviors, including pro-environmental behavior. However, relationships between affect and pro-environmental behavior are so far not well understood, and a very limited amount of previous research has examined the dynamic relationship between affect and pro-environmental behavior in people's daily lives. Such research is necessary as it has the potential to contribute to theories of pro-environmental behavior by showing that daily affect matters for pro-environmental behavior. It also can inform practice by showing how pro-environmental behavior may be more successfully encouraged. The overarching aim of this thesis is to examine links between everyday affective experiences and pro-environmental behavior. The three main Research Questions are: How do daily affective experiences relate to daily pro-environmental behavior? Are different types of daily affective experiences related to different types of daily pro-environmental behaviors? Do daily affective experiences interact with more stable characteristics of the individual (i.e., pro-environmental attitude) and perceived context (i.e., social norms) in relation to pro-environmental behavior?

Chapter 2 reviews traditional approaches to understanding pro-environmental behavior and introduces a novel multilevel perspective on pro-environmental behavior with a focus on temporally stable and fluctuating aspects of, and factors relating to, pro-environmental behavior. This chapter presents a range of topics that could be researched by applying such a perspective, with relationships between affect and pro-environmental behavior included as one potential topic. It is argued that people's pro-environmental behavior and affective experiences vary from day to day and, thus, should be conceptualized and operationalized accordingly. Chapter 2 advocates the use of daily diary and experience sampling methodologies in order to capture the dynamic relationship between affect and pro-environmental behavior as it occurs in people's everyday lives.

Chapter 3 applies the multilevel perspective introduced in Chapter 2 to investigate the relationship between daily affect and pro-environmental behavior in the work place. Specifically, Chapter 3 examines daily activated positive affect (i.e., feeling enthusiastic and excited) and unactivated positive affect (i.e., feeling calm and relaxed) in relation to daily task-related pro-environmental behavior (i.e., the extent to which employees complete required work tasks in environmentally-friendly ways) and daily proactive pro-environmental behavior (i.e., the extent to which employees show personal initiative when acting in environmentally-friendly ways at work). Pro-environmental attitude is examined as a moderator of these relationships. Using a daily diary study design ($N = 56$; 910 daily entries), this study demonstrates that daily unactivated positive affect and pro-environmental attitude positively predict daily task-related pro-environmental behavior. It also shows that daily activated positive affect positively predicts daily proactive pro-

environmental behavior among employees with a less positive pro-environmental attitude, but not among employees with a more positive pro-environmental attitude. This study is the first to examine the relationships between affect and pro-environmental behavior in everyday life.

Chapter 4 builds upon the previous chapter by extending the generalizability of the previous study's findings to outside of the work place. A daily diary study is used to examine the role of a different between-person moderator, perceived social norms, on the relationships between daily affective experiences and pro-environmental behavior ($N = 94$; 1,148 daily entries). This chapter shows that unactivated positive affect and pro-environmental social norms are positively related to basic pro-environmental behavior (i.e., pro-environmental behavior that is carried out more easily and may be a matter of habit; similar to task-related pro-environmental behavior), and activated positive affect is positively related to proactive pro-environmental behavior. In addition, pro-environmental social norms are shown to moderate the relationship between unactivated positive affect and basic pro-environmental behavior, such that this relationship is stronger when pro-environmental social norms are less positive.

Chapter 5 uses an experience sampling study ($N = 96$; 1,152 daily entries) to examine the relationships between two specific emotions, pride and guilt about environmental behavior (as opposed to more diffuse feelings of positive affect felt during the day as in the previous two chapters), and pro-environmental behavior. As in Chapter 4, pro-environmental social norms are examined as a moderator. This chapter shows that, within a short time period, engagement in pro-environmental behavior is positively related to pride and negatively related to guilt. It also shows that pride about environmental behavior is positively related to subsequent engagement in pro-environmental behavior (i.e., pro-environmental behavior measured during the following short time period), but only for people who perceive more positive pro-environmental descriptive norms.

This thesis provides the first evidence that different types of daily affective experiences are related to different types of daily pro-environmental behavior, and that daily affective experiences interact with more stable characteristics of the individual (i.e., pro-environmental attitude) and perceptions of the context (i.e., social norms) in relation to pro-environmental behavior. Implications for future research on the complex associations between daily affective experiences and pro-environmental behavior are discussed. Overall, this thesis demonstrates that pro-environmental behavior theory and research should consider the everyday, dynamic links between affect and pro-environmental behavior.

Declaration by author

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

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Peer-reviewed publications:

Bissing-Olson, M. J., Iyer, A., Fielding, K. S., & Zacher, H. (2013). Relationships between daily affect and pro-environmental behavior at work: The moderating role of pro-environmental attitude. *Journal of Organizational Behavior*, 34(2), 151-171. doi: 10.1002/job.1788

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Iyer, A.	Edited paper and provided critical feedback (40%)

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Iyer, A.	Designed survey (15%) Edited paper and provided critical feedback (40%)

Contributions by others to the thesis

As primary and associate advisors on the present research, Dr Kelly Fielding and Dr Aarti Iyer provided guidance on study design and data analysis, reviewed and commented on all of the manuscripts in the thesis, as well as the thesis as a whole. Dr Hannes Zacher reviewed and commented on one of the manuscripts included in this thesis (Chapter 3).

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TABLE OF CONTENTS

Abstract	ii
Acknowledgements	ix
List of Tables and Figures	xiii
Chapter 1: General Introduction	1
Affect and pro-environmental behavior.....	2
Moderators of relationships between pro-environmental behavior and emotion	10
Methods.....	12
Thesis overview	12
References.....	15
Chapter 2: A multilevel perspective on stability and change in pro-environmental behavior .	22
Inter-individual approaches to pro-environmental behavior.....	26
A multilevel perspective	28
Methods for studying intra-individual effects.....	36
Suggestions for future research.....	40
Conclusion	42
References.....	44
Chapter 3: Relationships between daily affect and pro-environmental behavior at work: The moderating role of pro-environmental attitude	50
Method	57
Results.....	61
Discussion	66
References.....	74
Chapter 4: Good moods and good deeds: A daily diary study on positive affect and pro-environmental behavior	82
Method	87
Results.....	89
Discussion	95
References.....	100
Chapter 5: Experiences of pride, not guilt, predict pro-environmental behavior when pro-environmental descriptive norms are more positive	107
Method	113
Results.....	115

Discussion	122
References.....	127
Chapter 6: General Discussion	132
Main findings	132
Theoretical implications.....	135
Practical implications.....	138
Strengths, limitations, and future research.....	138
Conclusion	140
References.....	142

LIST OF FIGURES AND TABLES

Chapter 2

Figure 1: Comparison between an inter-individual (left) and a multilevel (right) approach to pro-environmental behavior.....	25
Table 1: Categories of variables impacting on pro-environmental behavior.....	30
Figure 2: Simpson’s paradox: The trend for the data from each person (triangle, circle, square) is positive. In contrast, when the data from each person is aggregated and combined into one data set, the trend is negative	35
Table 2: Research methods for studying daily experience	37

Chapter 3

Figure 1: Overarching model and hypotheses.....	57
Table 1: Means (M), standard deviations (SD), and correlations of study variables.....	63
Table 2: HLM results for models predicting daily task-related pro-environmental behavior and daily proactive pro-environmental behavior	64
Figure 2: Graph of the interactive effect of pro-environmental attitude on the relationship between daily activated positive affect and daily proactive pro-environmental behavior	66

Chapter 4

Table 1: Descriptive statistics and correlations of the study variables	91
Table 2: HLM results for models predicting daily basic and proactive pro-environmental behavior.....	93
Figure 1: Graphic depiction of main results of HLM analyses.....	94
Figure 2: Graph of the interactive effect of pro-environmental social norms on the relationship between daily unactivated positive affect and daily basic pro-environmental behavior	95

Chapter 5

Table 1: List of pro-environmental behaviors included in the pro-environmental behavior index.....	115
Table 2: Descriptive statistics and correlations of study variables	117
Table 3: HLM results for models predicting pride and guilt about environmental behavior	119
Table 4: HLM results for models predicting subsequent pro-environmental behavior	120
Figure 1: Graph of the moderating effect of pro-environmental descriptive norms on the relationship between pride about environmental behavior and subsequent pro-environmental behavior.....	121

CHAPTER 1

GENERAL INTRODUCTION

Our daily lives are filled with a variety of experiences, events, behaviors, and settings. Two specific aspects of everyday life include experiencing emotions and engaging in behaviors that will impact the environment in positive ways (e.g., seeking to conserve natural resources and limiting waste) or negative ways (e.g., using resources and producing waste). At first, these two aspects of everyday life—emotion and environmental behavior—may seem unrelated. Sometimes, however, they intersect. For instance, we may wake up feeling happy and energized, and therefore decide to cycle to work instead of taking the car. As a result, we feel proud about cycling instead of driving the car and share this enthusiasm with others, inspiring them to do the same. Cycling as a form of transportation is a type of pro-environmental behavior (i.e., reduction of CO₂ emissions). Inspiring others to use green transportation is also a pro-environmental behavior (i.e., encouraging other people to engage in environmentally friendly action). This example illustrates the two ways in which pro-environmental behaviors can be linked with emotional experiences: emotions leading to particular behaviors, and behaviors eliciting specific emotions.

The relationships between emotions and pro-environmental behavior in everyday life have received limited attention in research on the antecedents of pro-environmental behavior. Instead, this work has mainly focused on individual differences and contextual factors, such as pro-environmental attitude and social norms. Such factors are important predictors of pro-environmental behavior (Bamberg & Möser, 2007). Emotions, however, should also be considered: Emotions can be powerful triggers of a wide range of social behaviors (Dolan, 2002; Mauss, Levenson, McCarter, Wilhelm, & Gross, 2005), including pro-environmental behavior (Ferguson & Branscombe, 2010; Halpenny, 2010; Harth, Leach, & Kessler, 2013; Hine, Marks, Nachreiner, Gifford, & Heath, 2007; Koenig-Lewis, Palmer, Dermody, & Urbye, 2014; Onwezen, Antonides, & Bartels, 2013; Rees, Klug, & Bamberg, 2015). Research into the everyday relationships between emotions and pro-environmental behavior has the potential to contribute to theories of pro-environmental behavior—by demonstrating the role of emotion as a predictor variable—and to enlighten us as to how pro-environmental behavior may be more successfully encouraged. These are important goals in light of the human-caused damage facing our environment (Gifford, 2014; Stern, 2000a), and the urgent need to reverse this course in order to avoid further disruption of fragile ecosystems around the globe.

The overarching aim of this thesis is to generate a better understanding of the dynamic links between everyday affective experiences and pro-environmental behavior. I seek to answer three main Research Questions:

- How do daily affective experiences relate to daily pro-environmental behavior? (Research Question 1);
- Are different types of daily affective experiences related to different types of daily pro-environmental behaviors? (Research Question 2);
- Do daily affective experiences interact with more stable characteristics of the individual (i.e., pro-environmental attitude) and context (i.e., perceived social norms) to shape pro-environmental behavior? (Research Question 3).

I address these Research Questions in three ways: First, I acknowledge that people's pro-environmental behavior and affective experiences vary from day to day and, therefore, conceptualize and account for this within-person variation when operationalizing these constructs. Daily diary and experience sampling methodologies are used to capture the dynamic relationships between affect and pro-environmental behavior as they occur daily within the rich contexts of people's real-world activities (Bolger, Davis, & Rafaeli, 2003). Second, I consider how different types of pro-environmental behavior are related to a range of affective experiences, from general moods (e.g., feeling happy) to particular emotions about behavior (e.g., guilt about previous environmental behavior). I distinguish between different types of pro-environmental behavior based on the level of personal initiative, or proactivity that is required to carry out the behavior. Third, I examine how pro-environmental attitude (an individual differences characteristic) and perceived social norms (a characteristic of the perceived social context) interact with different affective experiences in relation to the different types of pro-environmental behavior.

In the following sections, I provide definitions of emotion and pro-environmental behavior and review previous research on these topics. I then draw on theories of emotion to propose answers to my first two Research Questions, which focus on the link between affective experiences and pro-environmental behavior. Subsequently, I review literature relating to potential moderators of the affect-pro-environmental behavior relationship, which addresses my third Research Question. Finally, I introduce methodological aspects pertinent to the present research and present an overview of the remaining chapters in this thesis.

Affect and Pro-environmental Behavior

Definitions

Affect. In this thesis, I conceptualize and refer to emotional, or affective, experiences in three ways: (a) affect, (c) mood, and (d) emotion. Each term reflects a nuanced understanding of emotional experience (Forgas, 1995). The first term, "affect," is an all-encompassing term for any

type of emotional experience. The term “mood” refers to a diffuse emotional experience that is not necessarily connected to a specific target. In contrast, the term “emotion” is usually used to refer to distinct emotional experiences that are directed at a specific target (e.g., feeling proud about an accomplishment). In the empirical chapters of this thesis, I examine how high and low activated positive affect and two specific emotions relate to pro-environmental behavior.

Positive affect is relevant to pro-environmental behavior because of its strong motivational potential for prosocial behavior (as discussed in more detail below). I differentiate between two types of positive affect based on level of activation or arousal: Activated positive affect refers to affective experiences that involve high levels of energy, such as feeling enthusiastic or excited. In contrast, unactivated positive affect refers to affective experiences that involve low levels of energy, such as feeling at rest or calm (Barrett & Russell, 1999; Larsen & Diener, 1992; Russell, 1980; Watson & Tellegen, 1985). In a separate study, I consider the relationship between pro-environmental behavior and the specific moral emotions of pride and guilt (Tangney, Stuewig, & Mashek, 2007; Tracy & Robins, 2007b). These two emotions arise based on one’s level of compliance with personally important standards of behavior, and they can influence subsequent behavior by acting as moral guides. Moral emotions are particularly relevant to the domain of individual pro-environmental behavior, which involves fierce public debates involving justice and responsibility as well as codes of conduct for human behavior.

Pro-environmental behavior. Pro-environmental behavior, in general, is defined as action that benefits the natural environment or reduces one’s negative impact on the environment (Stern, 2000b). In this thesis, I distinguish between two broad types of pro-environmental behavior based on the level of effort or personal initiative required to carry the behavior out. The first type of pro-environmental behavior is carried out relatively easily and may be a matter of habit, such as recycling paper at a location where bins are available (Aarts & Dijksterhuis, 2000; Vining & Ebreo, 1992). Depending on the context, I refer to this type of pro-environmental behavior as “task-related pro-environmental behavior” or “basic pro-environmental behavior.” One empirical study presented in this thesis focuses on the relationship between daily positive affect and pro-environmental behavior in the context of the work place (Chapter 3). I therefore use the term “task-related” to indicate that the pro-environmental behavior is performed within the realm of one’s normal work tasks and, thus, should be relatively easy to carry out or may even be a matter of habit (Borman & Motowidlo, 1993; Williams & Anderson, 1991). Another empirical study examines the relationship between daily positive affect and pro-environmental behavior in a wide variety of contexts that may or may not include the work context (Chapter 4). I therefore use the term “basic” as an all-inclusive term to capture a range of easy or habitual behaviors.

The second broad type of pro-environmental behavior requires greater effort and personal initiative, such as changing to more environmentally friendly transportation options (Bissing-Olson, Iyer, Fielding, & Zacher, 2013; Norton, Zacher, & Ashkanasy, 2014). I refer to this type of behavior as “proactive pro-environmental behavior.” Generally, proactive behavior involves self-starting action to produce a desired change in one’s own and others’ lives (Grant & Ashford, 2008; Parker, Bindl, & Strauss, 2010). Opportunities and resources to make such changes may not be readily available, which means that individuals would need to create or develop them. I conceptualize basic and proactive pro-environmental behaviors as distinct, but related, forms of pro-environmental behavior: Basic pro-environmental behavior is carried out within a person’s established repertoire of action, whereas proactive pro-environmental behavior moves outside of one’s familiar pattern of behavior and involves a more active and change-oriented approach to environmental behavior.

In this thesis, pro-environmental behavior is examined as it occurs on a daily basis. Thus, “daily pro-environmental behavior” refers to both basic and proactive pro-environmental behaviors that are carried out during the day. These include behaviors that occur multiple times per day or only one time per day.

Previous Research on Affect and Pro-environmental Behavior

Prominent reviews of pro-environmental behavior research suggest, that affect might be an important predictor of pro-environmental behavior (Bamberg & Möser, 2007; Kals & Müller, 2012; Kollmuss & Agyeman, 2002; Vining & Ebreo, 2002). Empirical studies on affect–pro-environmental behavior relationships, though limited in number, support this proposition as well as provide fertile ground for further investigation.

Previous studies on relationships between affect and pro-environmental behavior share a focus on a particular type of affective experience that is directly related to the natural environment or to engagement in pro-environmental behavior. In one study, for instance, recycling behavior was predicted by three distinct emotions about the environment: worry about environmental problems, feeling hope when thinking about environmental problems, and feeling joy in contributing to solving environmental problems (Ojala, 2008). Another line of research (Carrus, Passafaro, & Bonnes, 2008) shows that people’s negative anticipated emotions (e.g., anger, frustration, sadness) about engaging in pro-environmental behavior (e.g., using public transportation instead of a private vehicle, engaging in household recycling) reduced their desire to engage in these behaviors. In two studies, Kaiser (2006) showed that anticipated guilt about not engaging in pro-environmental behavior predicted intentions to engage in pro-environmental behavior (e.g., recycling paper). In a study by Koenig-Lewis et al. (2014), participants indicated that both positive emotions (i.e. happy, enthusiastic, optimistic, proud, content) and negative emotions (i.e., nervous and worried) evoked from imagining drinking from plastic beverage containers that incorporated organic material were

found to predict intentions to purchase such beverage containers. Furthermore, different modes of travel have been demonstrated to elicit a distinct affective appraisal (e.g., driving is unpleasant and arousing, whereas cycling is pleasant and arousing; Gatersleben & Uzzell, 2007). Finally, positive anticipated emotions (e.g., feeling happy and satisfied) and negative anticipated emotions (e.g., feeling disappointed and frustrated) regarding cycling have been shown to increase and decrease, respectively, desire to cycle as a form of transportation (Passafaro et al., 2014).

These studies have demonstrated a clear link between emotions that are felt in relation to the environment or environmental behavior and willingness to engage in pro-environmental behaviors (i.e., integral or task-related emotions; Cavanaugh, Bettman, Luce, & Payne, 2007). What is currently missing though is an examination of the role of transient or incidental, affective experiences that are not directly related to the natural environment or to engagement in pro-environmental behavior (e.g., being in a positive mood during the day) in motivating pro-environmental behavior. Thus, a whole range of affective experiences that people have, such as diffuse moods or incidental emotions directed at other targets, have been left unexamined in relation to engagement in pro-environmental behavior. Such affective experiences have the potential to influence pro-environmental behavior and are worthy of further investigation, as described in more detail in the next section.

A second common feature of work on affect and pro-environmental behavior is the use of experimental designs or single-measurement survey designs. In such studies, data collection typically occurs at a single time-point and, for experiments, is carried out in laboratory settings. Participants are typically asked to think about and summarize their environmental behavior in a very general sense, or are given explicit feedback about their environmental behavior. For example, in two studies by Mallett (2012), participants were asked to broadly reflect on their country's poor environmental behavior. Those participants who reported feeling more collective guilt (i.e., feel guilt about their country's poor environmental behavior, such as wasting natural resources and contributing to climate change) were more likely to indicate a willingness to support an organization that protects the environment as well as intentions to engage in pro-environmental behaviors, such as avoiding buying bottled water and using the stairs instead of the elevator. Another example is an experiment by Rees et al. (2015), in which participants were confronted with an in-group's (e.g., humanity's) impact on climate change through reading short texts about environmental damages. This led to feelings of collective guilt, which in turn led to intentions to engage in pro-environmental behavior as well as actual behavior (i.e., signing a petition regarding environmental pollution).

The use of experimental study designs, such as the examples above, has the great advantage of providing evidence of causality; however, the experience of participants in such studies (e.g.,

externally driven forms of reflection or being given feedback about environmental behavior) rarely mirror individuals' day-to-day decision-making about whether or not to engage in pro-environmental behavior. One-time survey designs suffer from a similar problem of low external validity. That is, people do not often receive such explicit, external feedback about their environmental behavior; rather they make in-the-moment decisions about how to behave. Past research, therefore, tells us little about how everyday, or transient, affective experiences (e.g., being in a positive mood during the day) may relate to pro-environmental behavior in our everyday lives. The use of daily diary or experience sampling designs would help shed light on these daily relationships (see the section on Methods below and Chapter 2).

A final common feature of previous research on affect and pro-environmental behavior has been the tendency to measure the willingness, intention, or desire to engage in pro-environmental behavior, as opposed to measuring actual behavior (whether through self-report measures or objective indicators). For example, in an experiment by Ferguson and Branscombe (2010), willingness to conserve energy and pay green taxes was predicted by collective guilt about one's country's greenhouse gas emissions, which in turn was elicited by information about human causes of climate change. Another example is experimental research by Mallett, Melchiori, and Strickroth (2013), in which willingness to support a pro-environmental group was predicted by collective guilt about an in-group's environmental impact. Although there are a couple of notable exceptions (Mallett, 2012; Rees et al., 2015), the predominant focus in past research on pro-environmental willingness or intentions highlights a need for more research examining the relationship between affect and behavior. There is never a perfect correspondence between intentions and behavior and, thus, it is important to investigate affect as a predictor of pro-environmental behavior by assessing the strength of its predictive ability on behavior itself. The empirical research presented in the current thesis addresses this issue by using self-report measures of pro-environmental behavior focusing on a range of specific behaviors (Chapter 5) as well as the two broad types of pro-environmental behavior, basic and proactive (Chapter 3 and Chapter 4).

A final note about previous research focuses on its relatively narrow focus on particular emotions. Although both positive and negative emotions have been shown to influence engagement in pro-environmental behavior, very little research has focused on the specific emotion of pride. One exception is a study by Harth et al. (2013), which also examined the emotions of collective guilt and anger. Harth and colleagues showed that reading about one's country's responsibility for environmental damage, or protection, induced feelings of collective guilt and anger, or pride, respectively. In turn, collective guilt predicted intentions to repair the damage caused by the in-group (i.e., one's country) and anger predicted intentions to punish wrongdoers. Collective pride about in-group pro-environmental behavior predicted a desire to donate money for environmental

protection. A second study (Onwezen et al., 2013) showed that anticipated pride and guilt regarding the purchase of environmentally friendly products predicted intentions to buy environmentally friendly products and to travel via public transportation. These two studies are the first to establish links between the emotion of pride—in the form of collective pride and anticipated pride—and desire or intentions to engage in pro-environmental behavior. The current thesis contributes to this line of research by examining how feelings of pride about individuals' personal behavior (rather than collective in-group behavior) relate to subsequent actual (i.e., self-reported) pro-environmental behaviors (Chapter 5).

In sum, while previous research has been fundamental in establishing connections between emotions and pro-environmental behavior, there are four areas that remain fertile ground for further investigation. First, previous studies have focused almost exclusively on emotions that are directly linked to the environment or environmental behavior; this approach excludes a range of other affective experiences that people have in their daily lives, such as diffuse moods and incidental emotions that are not directly related to the natural environment. This thesis addresses this gap in the literature by examining the daily relationships between positive affect felt during the day (i.e., positive mood) and pro-environmental behavior carried out during that same day (Chapter 3 and Chapter 4). In this way, this thesis takes the first steps in exploring whether other types of affective experiences (i.e., those not directly linked to the environment) may be important for engagement in pro-environmental behavior.

Second, previous studies have almost exclusively employed experimental designs or one-time survey designs, in which participants are given external feedback in order to induce affect or are asked about their environmental behavior in a very broad sense. In the current thesis, daily diary and experience sampling study designs are used to investigate the dynamic relationships between affect and pro-environmental behavior as they occur in daily life and in close-to real time. As such, this approach increases the external validity of the research. Third, measures of pro-environmental behavior have typically focused on willingness, desire, or intention as opposed to direct (self-reported or objective) assessment of actual behavior. This point is addressed in this thesis through the use of self-reports of engagement in actual pro-environmental behavior. Fourth and finally, the emotion of pride in its relation to pro-environmental behavior has been under-researched. The current thesis presents an empirical study on the relationship of pride (and guilt) and pro-environmental behavior in everyday life, thus contributing to this promising line of research.

Daily Affect and Pro-environmental Behavior: Proposed Relationships

In this section, I draw on theory to address my first two Research Questions: How do daily affective experiences relate to daily pro-environmental behavior (Research Question 1)? How are different types of daily affective experiences related to different types of daily pro-environmental

behaviors (Research Question 2)? I draw on multiple theories of emotion; the choice of theoretical framework depends on the type of affective experience that is the focus of investigation. I approach the study of relationships between daily affect and pro-environmental behavior in two ways: First, I consider how daily positive affective experiences (e.g., mood) relate to daily engagement in pro-environmental behavior. Second, I examine how two specific emotions, pride and guilt about environmental behavior, relate to pro-environmental behavior over the course of the day.

When considering the relationships between incidental positive affect and pro-environmental behavior, I primarily draw on the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001), which states that the experience of positive affect has important implications for many positive behaviors. Positive affect expands attentional focus (Derryberry & Tucker, 1994) and widens the range of actions that come to mind, facilitating alternative and positive ways of thinking and acting (Fredrickson, 1998, 2001). Positive affect also builds personal resources, such as energy levels and a sense of social responsibility. Taken together, these aspects of positive affect should propel people to engage in positive behaviors (Fredrickson, 1998, 2001), such as pro-environmental behaviors. Empirical work supports this proposition: Positive affect has been shown to predict prosocial behaviors (Cavanaugh, Bettman, & Frances Luce, 2015; Isen, 1999; Lyubomirsky, King, & Diener, 2005), including time spent helping others (Lucas, 2001), donating money to charity (Cunningham, Steinberg, & Grev, 1980), and giving blood (O'Malley & Andrews, 1983). Pro-environmental behavior is a type of beneficial or altruistic behavior directed towards the natural environment. Thus, based on the broaden-and-build theory of positive emotions and previous research, I propose that positive incidental affect will be associated with pro-environmental behavior. In other words, I expect that people who experience positive affect (e.g., contentment or enthusiasm) should be more likely to engage in pro-environmental behavior because they are more open to alternative and positive ways of thinking and acting and have more personal resources available for these behaviors.

The broaden-and-build theory of positive emotions does not distinguish between the effects of positive affect based on level of activation. However, the broader emotion literature notes that positive affect can vary according to its level of activation (i.e., activated positive affect and unactivated positive affect) and that different levels of activation may lead to specific types of action (Frijda, 1986; Frijda, Kuipers, & ter Schure, 1989). Unactivated positive affect (e.g., feeling relaxed), for example, may trigger reflection and a tendency to see connections, whereas activated positive affective (e.g., feeling excited) may lead to approach behavior requiring more effort or energy, such as exploration (De Rivera, Possel, Verette, & Weiner, 1989; Izard, 1977). Thus, unactivated positive affect may inspire approach-oriented, prosocial action (Fredrickson, 1998, 2001), but only if such action does not require much energy or effort to achieve (De Rivera et al.,

1989; Izard, 1977). People experiencing unactivated positive affect, therefore, may not feel the need to make great changes to their pro-environmental behavior, rather, they are content to continue behaving in ways that are low-cost and habitual (i.e., engaging in basic pro-environmental behavior). In contrast, activated positive affect may provide the basis for taking action that requires more energy and personal initiative, such as proactive pro-environmental behavior. Activated positive affect has been shown to predict engagement in behavior that goes above and beyond standard expectations, such as proactive behavior (Bindl, Parker, Totterdell, & Hagger-Johnson, 2012; Foo, Uy, & Baron, 2009; Parker et al., 2010; Seo, Barrett, & Bartunek, 2004; Seo, Bartunek, & Feldman Barrett, 2010). Thus, I propose that activated positive affect, and not unactivated positive affect, should be positively related to proactive pro-environmental behavior.

When considering how the specific emotions of pride and guilt relate to pro-environmental behavior over the course of the day, I draw on appraisal theory (Roseman & Smith, 2001) and functionalist theories of moral emotions (Tangney et al., 2007; Tracy & Robins, 2007b). Appraisal theory posits that emotions arise from appraisals (i.e., evaluations) of events and situations (De Rivera et al., 1989; Frijda et al., 1989; Izard, 1977; Roseman & Smith, 2001). Similarly, functionalist theories of moral emotions posit that an individual's behavior can elicit feelings of pride or guilt if the individual appraises that behavior as conforming or not conforming, respectively, with personally important standards for behavior. In turn, pride and guilt can influence subsequent behavior by acting as moral guides. That is, guilt motivates a desire to atone for prior wrong-doing (Barrett, 1995; Tangney & Dearing, 2002) and the emotion of pride, arising from the achievement of acting in accordance with one's morals, motivates further such achievement (Fredrickson, 2001; Tracy & Robins, 2007a). Thus, engagement in pro-environmental behavior—a positive and socially-desired behavior (Gifford, 2014)—should lead to feelings of pride, whereas lack of engagement should lead to feelings of guilt. Subsequently, these feelings of pride should lead to continued or increased engagement in pro-environmental behavior and the feelings of guilt, sparking a need to atone for the lack of behavior, should lead to engagement in pro-environmental behavior as well.

I do not expect that negative affect in the form of diffuse moods (e.g., feeling down during the day) will be related to pro-environmental behavior. The broaden-and-build theory of positive emotions argues that negative affect narrows the scope of thoughts and actions that come to mind, and does not build personal resources beyond those already available (Fredrickson, 1998, 2001). The broader emotion literature also states that negative affective experiences, such as fear or anger, reduce focus to specific, potential actions pertinent to the threatening stimulus that triggered the negative affective experience (e.g., flee, attack; Frijda, 1986; Frijda et al., 1989). Therefore, negative affect should neither promote nor inhibit positive behaviors. Pro-environmental behaviors

are positive and pro-social behaviors (Kollmuss & Agyeman, 2002; Steg & Vlek, 2009); therefore, activated or unactivated negative affect (i.e., feeling distressed or sluggish, respectively) should not be related to daily basic or proactive pro-environmental behavior.

Moderators of Relationships Between Pro-environmental Behavior and Emotion

Different contexts (e.g., norms for behavior) and person factors (e.g., attitude) can influence the strength of relationships between daily affect and pro-environmental behavior. Below, I discuss how pro-environmental attitude and social norms may act as such moderators.

Pro-environmental Attitude

Pro-environmental attitude, defined as a person's tendency to be concerned about the natural environment (Bamberg, 2003; Hawcroft & Milfont, 2010), is an important direct predictor of pro-environmental behavior (Bamberg & Möser, 2007; Kaiser, Wölfing, & Fuhrer, 1999). This relationship is supported by more general theories of attitude-behavior relations, such as the theory of planned behavior (Ajzen, 1991, 2012). I propose that it could also moderate the proposed relationships between positive affect and pro-environmental behavior. Specifically, I expect that people with a less positive or more ambivalent pro-environmental attitude should be more likely to be influenced by their emotional state than are people who have a more positive pro-environmental attitude. In other words, people with a more positive pro-environmental attitude should be more likely to be guided by that pro-environmental attitude and engage in pro-environmental behavior regardless of how positive they are feeling on any particular day. In contrast, when their pro-environmental attitudinal guide is less positive or more ambivalent, then affective cues should be more potent in influencing behavior.

This proposition is consistent with the broaden-and-build theory of positive emotions, which states that positive affect widens the range of actions that come to mind, facilitating alternative and positive ways of thinking and acting, as well as building personal resources such as a sense of social responsibility (Fredrickson, 1998, 2001). Thus, people with a less positive pro-environmental attitude should be more likely to engage in pro-environmental behavior when they are experiencing positive affect because such behavior represents the alternative, prosocial behavior that is more likely to come to mind when experiencing positive affect. In contrast, pro-environmental behavior would not be considered to be exceptional or out of the ordinary among people with a more positive attitude. That is, people with a more positive pro-environmental attitude should engage in such behavior independent of their daily affective experiences. For these people, positive affect may encourage other types of positive behaviors that diverge from their normal behavioral patterns (e.g., creativity or health promotion).

Social Norms

Pro-environmental social norms are the accepted or implied rules about how members of a group act and should act (Sherif, 1965; Turner, 1991) and can be divided into two categories: descriptive norms (i.e., what people actually do) and injunctive norms (i.e., what people should do) (Ajzen, 1991; Cialdini, Reno, & Kallgren, 1990). Research has shown that social norms are an important influence on pro-environmental behavior (Göckeritz et al., 2010; Goldstein, Cialdini, & Griskevicius, 2008; McDonald, Fielding, & Louis, 2014; Schultz, 1999). I propose that perceived social norms may moderate the relationship between affect and pro-environmental behavior in a similar way to environmental attitudes. That is, affect will be more likely to be associated with behavior when people perceive less supportive social norms than when they perceive more supportive social norms. Past research has shown that norms are a powerful influence on behavior and, therefore, when people perceive stronger normative support for behavior, the norms will likely be the over-riding guide for action. On the other hand, when individuals do not perceive strong normative support, other factors may be more likely to guide their behavior, and in-the-moment affect or mood is one of these factors. I also predict, however, that this pattern may only emerge for some types of behavior. Specifically, I expect that pro-environmental social norms will moderate the relationship between positive affect and basic pro-environmental behavior, but not the relationship between positive affect and proactive pro-environmental behavior. The reasoning for this is that social norms relate to normal and expected behavior and I argue that in our current society, this maps on to basic pro-environmental behavior. In contrast, proactive behavior involves showing initiative above and beyond expectations and established norms (Frese, Fay, Hilburger, Leng, & Tag, 1997) and when people engage in proactive pro-environmental behavior, they are doing something unexpected or different from the implied behavioral standards that pro-environmental social norms provide. Social norm perceptions will therefore be more pertinent to basic pro-environmental behavior than proactive pro-environmental behavior. Thus, perceived social norms are unlikely to moderate the relationship between activated positive affect and proactive pro-environmental behavior. As outlined above, for individuals who perceive lower normative support for pro-environmental behavior, and in line with broaden and build theory, positive affect is more likely to be associated with more basic pro-environmental behavior whereas for those who perceive more supportive norms, perceived norms should be strongly associated with pro-environmental behavior.

I further expect that perceived social norms moderate the relationships between pride and guilt and subsequent engagement in pro-environmental behavior. As mentioned in the previous section, feelings of pride and guilt arise from a sense of what is good or effective behavior (e.g., social norms) and, in turn, motivate prosocial behavior (Tangney & Dearing, 2002; Tracy, Robins,

& Tangney, 2007). In contexts where individuals perceive more supportive pro-environmental norms, this should strengthen the notion that pro-environmental behavior is seen as valued and good behavior, and thus should strengthen the motivational impact of moral emotions in shaping behavior to be consistent with a societally-held standard. Thus, pride about prior good environmental behavior should lead to greater engagement in subsequent pro-environmental behavior when perceived pro-environmental social norms are more supportive, compared with a context where such norms are less supportive. Guilt about prior poor environmental behavior should also lead to greater engagement in subsequent pro-environmental behavior when individuals perceive positive pro-environmental social norms, compared to when they perceive less positive pro-environmental norms. This is because the motivation to atone for previous poor behavior should be higher when contextual cues indicate that the positive behavior is highly valued. In other words, the positive relationships between pride and guilt and subsequent pro-environmental behavior should be stronger for people who perceive more positive pro-environmental social norms.

Methods

For any given individual, affective experiences and engagement in pro-environmental behavior are likely to vary during the course of a single day, as well as from one day to another. Therefore, it is important to employ research methods that capture this within-person variation. In Chapter 2, I present a multilevel approach on stability and change in pro-environmental behavior, in which I argue for more pro-environmental behavior research to consider short-term (e.g., daily) variation in engagement in pro-environmental behavior and factors related to pro-environmental behavior. In order to apply such an approach to the study of affect and pro-environmental behavior (as I do in the three empirical chapters of this thesis), I apply daily diary and experience sampling study designs (Bolger et al., 2003; Conner & Lehman, 2012; Conner & Mehl, 2012; Gunthert & Wenzel, 2012; Reis, 1994; Reis & Gable, 2000). Such designs require participants to provide frequent reports of affective experiences and pro-environmental behavior over the course of the day (experience sampling methods) or at the end of each day (daily diary methods), typically over a period of days. Advantages of these methods include the maximization of ecological validity and participants' real-time (or close to real-time) reporting of behavior and affective experiences, in contrast to efforts to recall experiences and behavior long after they have occurred. Disadvantages of experience sampling methods include participant burden and lack of causal certainty (Beal, 2015). Chapter 2 will provide a comprehensive outline of the methodological approach used in the current research, including the strengths and weaknesses of these methods.

Thesis Overview

The overarching aim of this thesis is to examine the dynamic links between everyday affective experiences and engagement in pro-environmental behavior. Three main Research

Questions address this aim: How do daily affective experiences relate to daily pro-environmental behavior? (Research Question 1); Are different types of daily affective experiences related to different types of daily pro-environmental behaviors? (Research Question 2); Do daily affective experiences interact with more stable characteristics of the individual (i.e., pro-environmental attitude) and context (i.e., perceived social norms) in relation to pro-environmental behavior? (Research Question 3). These questions address important gaps in the extant literature on affect and pro-environmental behavior. First, previous research has largely neglected affective experiences unrelated to environmental issues (e.g., diffuse moods or incidental affect) that might influence engagement in pro-environmental behavior. In addition, the use of primarily experimental or one-time survey designs in previous research means that day-to-day experiences of affect and pro-environmental behavior have been left unexamined. In other words, past research leaves questions unanswered about how everyday, or transient, affective experiences (e.g., being in a positive mood during the day) may relate to pro-environmental behavior in our everyday lives. In this thesis, I present one review paper and three empirical papers to address these issues.

Chapter 2 is a review paper that introduces a multilevel perspective on pro-environmental behavior with a focus on temporally stable and fluctuating aspects of, and factors relating to, pro-environmental behavior. First, more commonly used approaches to understanding pro-environmental behavior are reviewed. Second, I present a broad range of variables that could be linked to pro-environmental behavior, and outline how these are best investigated with a multilevel perspective. These variables include affect as well as other potential everyday triggers and outcomes of pro-environmental behavior (e.g., daily events and weather). Because a multilevel approach enables the investigation of such processes and variables, I argue that it can contribute to a greater understanding of pro-environmental behavior.

In Chapter 3, I use the multilevel perspective to investigate relationships between affect and pro-environmental behavior among employees working at small businesses. I also examine the role of pro-environmental attitude as a moderator of these relationships. The focus in this chapter is on the experience of activated and unactivated positive affect and two types of pro-environmental behavior: daily task-related pro-environmental behavior (i.e., the extent to which employees complete required work tasks in environmentally-friendly ways) and daily proactive pro-environmental behavior (i.e., the extent to which employees show personal initiative when acting in environmentally-friendly ways at work). Measures of activated and unactivated negative affect are also included as control variables. This study is the first to use a daily diary study design (as opposed to experiments or one-time surveys) to examine the relationships between emotion and pro-environmental behavior in everyday life.

Chapter 4 builds upon the previous chapter by extending the generalizability of the previous study's findings to outside of the work place and by examining the role of a different between-person moderator, perceived social norms, on the relationships between daily affective experiences and pro-environmental behavior. As in Chapter 3, two types of daily positive affective experiences are examined—daily unactivated positive affect (i.e., feeling relaxed and calm) and activated positive affect (i.e., feeling enthusiastic and excited)—in their relation to two types of daily pro-environmental behavior—daily basic pro-environmental behavior (i.e., pro-environmental behavior that is carried out more easily and may be a matter of habit) and proactive pro-environmental behavior (i.e., pro-environmental behavior that requires more effort and personal initiative).

Chapter 5 moves away from incidental affect (which was investigated in Chapters 3 and 4) and focuses instead on the relationships between specific emotions (i.e., pride and guilt) about environmental behavior and pro-environmental behavior. Chapter 5 also focuses on a behavioral index that includes a range of pro-environmental behaviors rather than the two broad categories of basic and pro-active pro-environmental behavior. The behavioral index includes specific behaviors that should be relatively easy to carry out (e.g., conserve electricity); thus, it is most similar to the concept of basic (or task-related) pro-environmental behavior. The relationships between pride, guilt, and engagement in pro-environmental behavior are examined using an experience sampling design in which participants report on their pride, guilt, and pro-environmental behavior four times during each day over a period of three days. Chapter 5 examines whether environmental behavior leads to feelings of pride and guilt, and whether these two emotions influence subsequent engagement in pro-environmental behavior. As in Chapter 4, the role of pro-environmental social norms as a potential moderator of relationships between pride and guilt, and pro-environmental behavior is explored.

Chapter 6, the General Discussion, provides a summary of the key conclusions from the empirical chapters and discusses strengths and limitations of the current research. In sum, this thesis is the first research in the pro-environmental behavior literature to demonstrate that affective experiences (even seemingly unrelated ones, such as positive mood) and pro-environmental behavior are linked as people go about their everyday lives. It also shows that individual characteristics, such as pro-environmental attitude, moderate daily relationships between affect and pro-environmental behavior. This thesis highlights the need for future research to consider the dynamic relationships between affect and pro-environmental behavior that are a part of people's everyday lives.

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CHAPTER 2

A MULTILEVEL PERSPECTIVE ON STABILITY AND CHANGE IN PRO-ENVIRONMENTAL BEHAVIOR

Abstract

Pro-environmental behavior and its antecedents are generally conceptualized using a between-person or inter-individual perspective, where these variables are treated as trait-like phenomena that are stable across contexts and time. While pro-environmental behavior has been shown to be relatively stable over long periods of time, day-to-day phenomena (e.g., affective states, weather) can lead to daily variation in behavior. We propose a novel multilevel perspective that conceptualizes pro-environmental behavior as potentially varying *within* a person between different contexts and time-points, in addition to varying *between* people. This multilevel approach can help shed light on heretofore unexplored factors and processes related to pro-environmental behavior, such as within-person variation in behavior, the influence of naturally-occurring contextual factors, temporal patterns or cycles, and, potential interactions between these processes. Adopting a multilevel approach can therefore contribute to a greater understanding of pro-environmental behavior, and the factors that predict more or less engagement in these actions.

Bissing-Olson, M. J., Fielding, K. S., & Iyer, A. (in prep). A multilevel perspective on stability and change in pro-environmental behavior.

A Multilevel Perspective on Stability and Change in Pro-environmental Behavior

There is great interest in understanding the factors that motivate pro-environmental behavior. To this end, hundreds of academic journal articles have presented theory and research on the antecedents of pro-environmental behavior. This work has undoubtedly been informative for campaigns aimed at increasing pro-environmental behavior and has contributed to the general body of knowledge on how people interact with their environment. Prominent theories and models propose a variety of social and psychological factors that predict pro-environmental behavior (for reviews, see Bamberg & Möser, 2007; Hines, Hungerford, & Tomera, 1986/87; Kollmuss & Agyeman, 2002). While there are some important differences in the particular focus of these frameworks, they do share one characteristic: They conceptualize pro-environmental behavior, and its antecedents, as stable trait-like phenomena. For instance, people's general engagement in pro-environmental behavior is seen as a function of individual characteristics (e.g., their general positive or negative attitude toward the behavior) or relatively stable features of a social context (e.g., degree of perceived social support for a behavior). Empirical research also operationalizes these constructs as stable, trait-like phenomena. For example, measures of both outcome and predictor variables are averaged for each individual; mean scores and relationships are then compared between individuals (or groups) in order to draw conclusions about the predictors of pro-environmental behavior. We describe this traditional conceptualization (and operationalization) of pro-environmental behavior—where comparisons are made between people—as a *between-person* or *inter-individual* approach.

In this paper, we propose a novel perspective on pro-environmental behavior: a multilevel approach that acknowledges not only the relative stability of pro-environmental behavior over the long-term, but also the potential *within-person* or *intra-individual* variation in pro-environmental behavior over short periods of time. For example, a person may engage in pro-environmental behavior on one day but not on another day, depending on factors such as daily mood, opportunities, or weather conditions. Figure 1 presents a simple representation of how variation in pro-environmental behavior can be captured by a multilevel perspective compared to the more common inter-individual approach. As seen in Figure 1, an inter-individual perspective is concerned with people's general levels of pro-environmental behaviors, for example, how often, overall, person A, B, C engaged in pro-environmental over the past week. In contrast, a multilevel perspective addresses (e.g., daily) variation in people's pro-environmental behavior. The average levels of pro-environmental behavior depicted on the right (in the multilevel approach) are similar to those depicted on the left (in the inter-individual approach), which could be due, for example, to differing levels of pro-environmental attitude. However, the multilevel approach also takes into account the day-to-day influences on engagement in pro-environmental behavior, such as daily events or affective states. Adopting a multilevel perspective on pro-environmental behavior can

shed light on factors and processes related to pro-environmental behavior that have been heretofore unexplored. This approach can therefore contribute to a greater understanding of pro-environmental behavior, and the factors that predict more or less engagement in these actions.

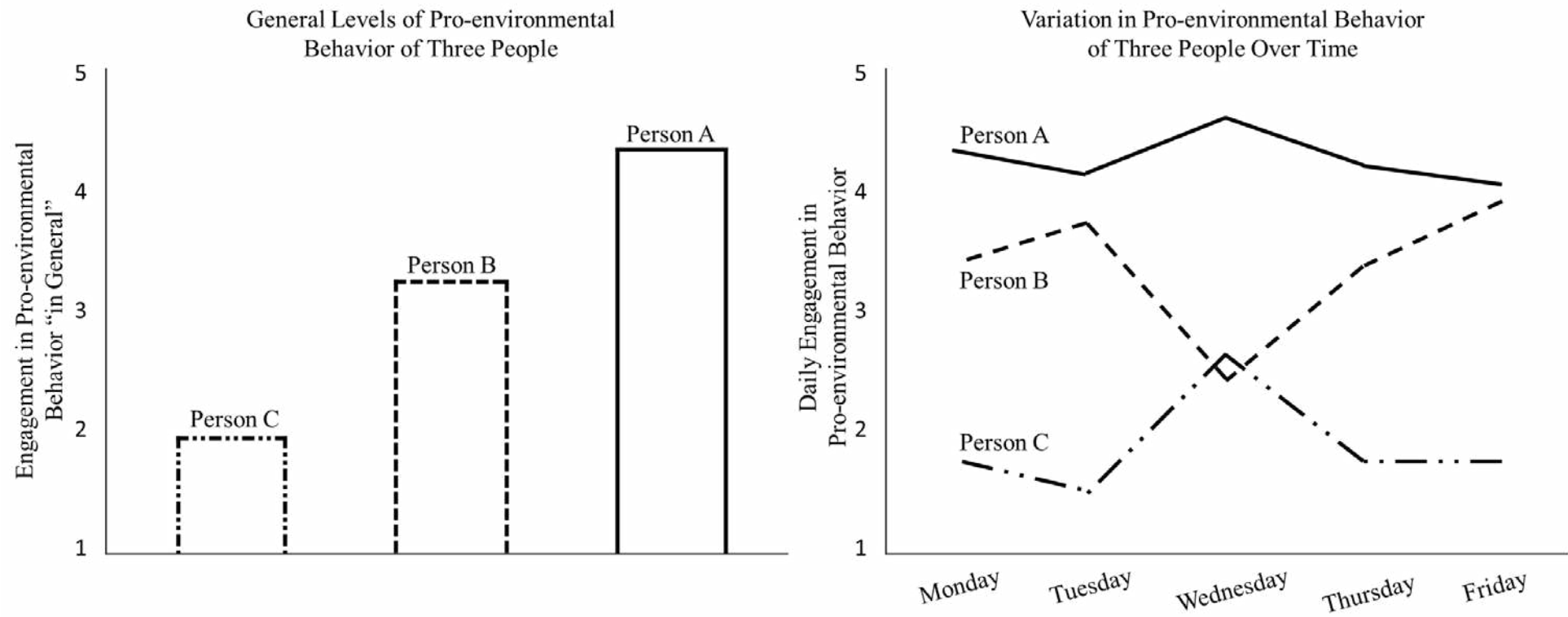


Figure 1. Comparison between an inter-individual (left) and a multilevel (right) approach to pro-environmental behavior.

In the current paper, we outline how a multilevel approach can add to our understanding of pro-environmental behavior. First, we review the advances made by current (inter-individual) approaches in understanding pro-environmental behavior and consider the potential contributions of a multilevel perspective to this literature. Second, we provide a more detailed explanation of the multilevel perspective, discussing broad topics for research that can be explored using this approach. The third section describes methods that enable empirical research adopting this perspective. Fourth and finally, we offer suggestions for future research that could adopt a multilevel perspective on stability and change in pro-environmental behavior.

Inter-individual Approaches to Pro-environmental Behavior

The foundations of some of the most influential theoretical frameworks in pro-environmental behavior research are based, at least in part, on stable, trait-like concepts, such as values, norms, attitudes, and sense of control. Examples of these theoretical frameworks include the norm-activation model (Schwartz, 1977), the theory of planned behavior (TPB; Ajzen, 1991, 2012), the value-belief-norm theory (Stern, 2000b; Stern, Dietz, Abel, Guagnano, & Kalof, 1999), and self-determination theory (Ryan & Deci, 2000). The *norm-activation model* (Schwartz, 1977) states that people's activated norms and values are experienced as feelings of moral obligation, which then motivate behavior. According to the *theory of planned behavior* (Ajzen, 1991, 2012), readily accessible beliefs related to the specific pro-environmental behavior of interest underpin attitudes, subjective norms, and perceived behavioral control; these shape intentions to perform the behavior and, in turn, the behavior itself. The *value-belief-norm theory* (Stern, 2000b; Stern et al., 1999) proposes a causal chain of influences on pro-environmental behavior: Personal values inform an ecological worldview that leads to an awareness of adverse consequences that, in turn, influences the belief that one is capable of making a difference. This belief then affects personal norms for engagement in pro-environmental behavior, which directly impact on pro-environmental behavior. *Self-determination theory* (Ryan & Deci, 2000) posits that satisfaction of the needs for competence, relatedness, and autonomy influence how intrinsically motivated a person is to engage in a behavior. When people experience more intrinsic motivation they tend to engage in more pro-environmental behavior (Pelletier & Sharp, 2008; Pelletier, Tuson, Green-Demers, Noels, & Beaton, 1998). These four theoretical frameworks reflect a predominantly inter-individual approach to pro-environmental behavior, which enables researchers to identify the extent to which differences in individuals' attitudes, norms, values, and so on are associated with their pro-environmental behavior.

In addition to the largely inter-individual approach reflected in the key theories in environmental psychology, longitudinal and experimental evidence also points to the stability of (or lack of variation in) pro-environmental behavior and concern about climate change over periods of

time (e.g., Kaiser & Byrka, 2011 ; Milfont, 2012). Specifically, research shows that environmentalism seems to stem from a stable prosocial personality (Kaiser & Byrka, 2011) and that concern towards climate change remained stable in a three-wave longitudinal study conducted over one year (Milfont, 2012). These are important and useful findings and we acknowledge that people tend to have durable patterns of thinking and acting in terms of their environmental impact. However, these studies are not able to address the short-term factors such as mood (Bissing-Olson et al., 2013) and weather (Li, Johnson, & Zaval, 2011) that may also shape people's behavior towards the environment. Their potential impact on pro-environmental behavior warrants investigation using a multilevel approach and through this approach more can be learned about the factors that influence pro-environmental decisions and behavior.

Despite their focus on stable predictors of behavior, there is some recognition in the main theoretical perspectives of the potential for intra-individual and short-term change in behavior. For example, the theory of planned behavior (Ajzen, 1991, 2012) suggests that targeting the antecedent beliefs associated with a specific pro-environmental behavior could help to change individuals' attitudes to that behavior. In terms of context, self-determination theory suggests that changing the context so that it meets peoples' needs for autonomy, competence, and relatedness (in relation to pro-environmental behavior) would result in greater intrinsic motivation to engage in pro-environmental actions.

Although these theories acknowledge the possibility of within-person changes in pro-environmental behavior, this question is rarely the explicit focus in research. Rather, behavior and its antecedents have been conceptualized as stable characteristics, with within-person change left to be inferred. Evidence of the inter-individual approach is further seen in empirical investigations of pro-environmental behavior. The methodological approach adopted by much of the research on pro-environmental behavior does not allow us to investigate the ways in which pro-environmental behavior and its antecedents might change within individuals over the short-term (e.g., daily), especially in naturally occurring contexts. For example, cross-sectional designs provide evidence for associations between pro-environmental behavior and other variables, but because people are asked at *one point in time* to provide *generalized* responses regarding their attitudes and behavior, as opposed to providing multiple responses over a period of time, it is not possible to examine within-person variability in pro-environmental behavior.

Within-person changes in behavior may be captured in other commonly used empirical approaches, such as experiments and interventions that measure behavior longitudinally. Researchers employ experimental designs and intervention studies to examine causal relationships between proposed antecedents and behavior. Change in behavior within an individual is addressed in experiments with a within-subjects design and in intervention studies. However, these approaches

do not provide a comprehensive investigation of within-person changes. Even when pro-environmental behavior might be tracked longitudinally in an intervention study (e.g., Fielding et al., 2013), the focus is still on the average levels of change in the experimental group post-treatment compared to a control group or other experimental groups, rather than on variability in pro-environmental behavior over time.

In sum, many of the most prominent theoretical frameworks used to explain pro-environmental behavior are based primarily on the notion of pro-environmental behavior and its antecedents as stable, trait-like variables. This is reflected in the theoretical underpinnings of pro-environmental behavior research as well as in empirical investigations. Although the inter-individual approach to pro-environmental behavior has yielded many important insights, we propose that there is scope for deepening our understanding by adopting a multilevel approach. The following section elucidates the importance of taking a multilevel perspective to better understand both stability and change in pro-environmental behavior stemming from intra-individual and inter-individual variation.

A Multilevel Perspective

When the extent to which a person engages in pro-environmental behavior is conceptualized and measured in terms of average levels of behavior (e.g., post experimental treatment) the day-to-day *within-person* or *intra*-individual processes of pro-environmental behavior are ignored. This leaves a number of questions unexamined: For example: How do people vary in the frequency with which they carry out pro-environmental behavior on a daily basis? How does pro-environmental behavior play out in the ‘real’ world, over time and across contexts? Are there temporal patterns or cycles for when people engage in more pro-environmental behavior? And how do these daily influences interact with stable individual traits? The answers to these questions would provide a wealth of information that could not only advance theory, but also inform and improve campaigns seeking to promote pro-environmental behavior. To address these research questions, we emphasize the importance of research that adopts a multilevel perspective on pro-environmental behavior that examines both intra-individual and inter-individual variation in pro-environmental behavior.

In the study of pro-environmental behavior the application of a multilevel approach as presented here is very limited (for exceptions see Bissing-Olson et al., 2013; Hine et al., 2009; Hine et al., 2016). In other areas of psychology, however, the multilevel perspective is becoming more popular (e.g., personality research and work on close relationships) or is well-established (e.g., emotion research and positive psychology), thus shedding light on how processes play out over time and across relationships and contexts. For instance, a multilevel approach has produced new knowledge about the length of emotional episodes and the types of within-person predictors that influence their duration (Verduyn, Van Mechelen, & Tuerlinckx, 2011). Similarly, a multilevel

perspective has helped develop new insights into close relationships, such as the way in which an individual's behavior affects his or her partner through daily interactions in their natural settings (Gable, Reis, & Downey, 2003). In personality research, a multilevel approach has revealed the extent to which stable personality traits are displayed over time in actual behavior occurring in natural settings (Fleeson & Gallagher, 2009).

We propose that a multilevel approach similar to those outlined above could also benefit pro-environmental research. For instance, researchers could document the length of episodes of high motivation to engage in pro-environmental behavior, as well as the extent to which other people influence these episodes; how partners or close others influence each other in their pro-environmental behavior on a daily basis; and how attitudes toward pro-environmental behavior relate to actual displays of behavior over time in natural contexts.

As a way to conceptualize the variables that may be important in a multilevel analysis of pro-environmental behavior, we propose a broad framework with two key dimensions that categorize variables into simple, but meaningful conceptual categories. The first dimension refers to the extent to which variables change over time (i.e., whether they are fluctuating or stable). The second dimension refers to potential sources of variability (i.e., person or context). As described in the section on inter-individual approaches to pro-environmental behavior, it is hinted at in prominent theoretical frameworks in pro-environmental behavior research that person and context variables could be two sources of intra-individual variability. The 2 (fluctuating, stable) \times 2 (person, context) framework is presented in Table 1, along with a set of illustrative (rather than exhaustive) examples. We acknowledge that the stability of a variable may change, depending on the time frame under consideration, and on the specific conceptualization of the construct. For example, person-focused variables such as attitudes (e.g., towards pro-environmental behavior or climate change) and personality, are relatively stable traits over days and weeks, but may fluctuate over longer time periods (e.g., months or years; Cattell, 1957; Rajecki, 1990). Affect (a person-focused variable) and weather (a context-focused variable), on the other hand, can fluctuate greatly within a day.

Table 1

Categories of Variables Impacting on Pro-environmental Behavior

Source of variable	Stability of variable	
	Fluctuating	Stable
Person	- Affect - Motivation - Self-efficacy	- Personality - Attitudes - Values
Context	- Daily events - Contact and interaction with specific groups - Weather	- Norms of specific groups - Physical infrastructure - Laws and regulations

Based on this framework and on the research questions proposed earlier in this section, we identify four broad types of information researchers can gather about pro-environmental behavior by applying a multilevel perspective. These include: (a) insights into the variation in pro-environmental behavior and the magnitude of this variation, (b) the influence of everyday contexts on pro-environmental behavior, (c) temporal patterns or cycles of pro-environmental behavior and exceptions to these, and (d) the potential discovery of hidden complexities in pro-environmental behavior yet untapped by conventional methods. In the following sections we elaborate on the ways in which the multilevel approach can be applied to pro-environmental behavior research.

Variation and Magnitude of Variation of Pro-environmental Behavior

In contrast to the ‘snapshots’ of pro-environmental behavior that traditional methods (e.g., cross-sectional surveys) have captured, a multilevel perspective and intensive longitudinal methods (see the section on methods for studying intra-individual effects below; Bolger & Laurenceau, 2013; Mehl & Conner, 2012) can offer ‘films’ of pro-environmental behavior. Multiple, brief measures of pro-environmental behavior, collected through intensive longitudinal methods, can be combined to examine how levels of pro-environmental behavior vary over time. Daily scores from each individual are compared with the respective individual’s mean scores in order to observe whether—and how—individuals might vary in the frequency of their pro-environmental behaviors over short periods of time. Critically, a multilevel perspective can help quantify such variation and to identify the predictors of the variation. These predictors could include stable traits (e.g., pro-environmental orientation, norms, strength of pro-environmental attitude), as well as varying factors such as daily events, physical infrastructure, and psychological states (e.g., affect, motivation).

A key contribution of the multilevel approach is that it could illuminate how stable traits might interact with fluctuating variables to influence variation in an individual’s pro-environmental

behavior. For example, those with a weak, pro-environmental attitude may tend to vary more in the frequency of their pro-environmental behavior, as they would be more susceptible to environmental cues and internal states and pressures (e.g., stress; Krosnick & Petty, 1994). On the other hand, people with a strong, pro-environmental attitude may vary little in their pro-environmental behavior because they are more aware of and responsive to opportunities to engage in such behaviors and because for them pro-environmental behavior has become habitual. A multilevel approach could help to understand what factors could promote greater consistency in the pro-environmental behavior of those with a weak, pro-environmental attitude. Conversely, this approach could also shed light on the obstacles that stymie the efforts of those with a strong, pro-environmental attitude, who otherwise would be expected to engage in high levels of pro-environmental behavior on a regular basis. In sum, a multilevel approach could unveil the extent to which people vary in their pro-environmental behavior as well as variables related to this variation.

The Impact of Differing Contexts on Pro-environmental Behavior

Positive attitudes and intentions do not always translate into action (Kollmuss & Agyeman, 2002). A critical step in understanding why this occurs may be to gain a deeper knowledge of how real-world contexts influence pro-environmental behavior. As Reis (2012, p. 7) notes, “By observing phenomena in their natural contexts, without controlling other influences, behavioral processes can be investigated within the full complement of circumstances in which they are most likely to occur.” In their paper on an ecological approach to environmental psychology, Winkel, Saegert, and Evans (2009), also argue that it is important to consider natural contexts in research. They call for more studies that incorporate different settings and environments into theory and empiricism, proposing that aspects of the physical environment most likely act as moderators and mediators of pro-environmental behavior. People are embedded within physical and social contexts that impact on behavior. Adopting a multilevel perspective would illuminate how pro-environmental behavior occurs in natural, everyday contexts that cannot be recreated in laboratory settings.

Two contextual factors that may be important for pro-environmental behavior are the physical environment and the presence of other people. A way to think about how the physical environment impacts on behavior is in terms of *affordances*; that is, situations (Reis & Holmes, 2012) or objects (Norman, 2002) provide cues for the expression of different psychological phenomena or for action. Different aspects of physical infrastructure have been found to impact on pro-environmental behavior, ranging from specific properties of recycling bins (Duffy & Verges, 2009) to aspects of waste collection systems (e.g., Gallardo, Bovea, Colomer, Prades, & Carlos, 2010; Guagnano, Stern, & Dietz, 1995). In studies involving a one-time survey and a field experiment, Li, Johnson and Zaval (2011) found that weather, another aspect of the physical

environment, influences people's self-reported concern about climate change and their willingness to donate to an environmental charity.

While past research has shed some light on the relationship between pro-environmental behavior and aspects of the physical environment, the research is predominantly framed by an inter-individual perspective rather than a multilevel one. That is, within-person variability in pro-environmental behavior in relation to physical contexts has not been examined. For example, in Li et al.'s (2011) study investigating the influence of weather on concern for climate change, if within-person variability were considered, research questions about the duration of the effect of perceived cold or warm spells on climate change concern could be addressed. Researchers could examine the trajectories of climate change concern within individuals over the days following a one-day cold or warm spell, or examine how climate change beliefs develop over a longer cold or warm spell. This type of information could aid environmental campaigns in decisions about when to promote their cause. Generally, it is important to consider context in relation to intra-individual variability in pro-environmental behavior as it could prove to be a critical piece of the puzzle, linking individual traits (e.g., attitudes) and intentions to actual behavior.

A second important contextual factor is the presence of different people or groups. The literature on norms (e.g., Goldstein et al., 2008; McDonald et al., 2014; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008) and Social Identity Theory (e.g., Dono, Webb, & Richardson, 2010; Fielding, McDonald, & Louis, 2008; Turner, 1991) clearly show that other people can shape one's willingness to engage (or not to engage) in pro-environmental behavior. These perspectives propose that norms are group-based guidelines for acceptable behavior and attitudes. Social Identity Theory further argues that when people identify as a member of a group, the attitudes and norms of that group guide their behavior. Both perspectives maintain that the salience of particular identities and norms varies depending on the situation (e.g., the people who are present). A multilevel perspective can help in investigating the extent to which the presence of different people, who may impact on norm and identity salience, influence variations in pro-environmental behavior in real-world contexts. For instance, a multilevel approach could address the question of whether young people might 'do the right thing' in terms of pro-environmental behavior in the presence of parents or authority figures in their everyday lives (i.e., in naturally occurring settings), but not when in presence of their peers. It could also help to understand whether this type of variation only occurs for pro-environmental behaviors that are not supported by widespread norms.

Temporal Patterns and Cycles in Pro-environmental Behavior

One of the unique contributions of the multilevel approach is a deeper understanding of how time influences pro-environmental behavior. That is, there may be certain times (e.g., weekends, seasons, day of the week, time of day, etc.) when people engage in more or less pro-environmental

behavior. When measurements of key constructs (e.g., pro-environmental behavior, its antecedents, and its consequences) are taken multiple times over a specified period, information about the role of time may be uncovered that would otherwise have been missed. This information could be important for theory development as well as for environmental campaigns.

Research on ego depletion offers a good illustration of how time affects behavior. According to the limited-resource model of self-control (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Vohs et al., 2008), whenever we exert effort to regulate our behavior, our willpower is drained, resulting in *ego depletion*. Ego depletion is defined as a personal resource loss that occurs after the exertion of self-control (Muraven, 2007). Following from this, at the end of the day when people are potentially ego-depleted, they may be less likely to engage in pro-environmental behaviors, especially if the behaviors are difficult or require significant cognitive or physical resources. Hence, it could be that there are daily cycles of pro-environmental behavior that map on to the extent to which people are ego-depleted.

Time can also serve as a proxy for other changes in a person's life that follow typical patterns or cycles. For example, levels of pro-environmental behavior may differ on the weekend, compared to during the week for a range of reasons (e.g., participation in different types of activities, access to different types of contexts and infrastructures, and/or differences in intra-individual factors such as mood; Stone, Schneider, & Harter, 2012). While these predictors of pro-environmental behavior may not necessarily arise only as a function of time passing, it would nevertheless be useful for environmental campaigns to uncover what times of the day, week, month, and so on people are more likely to engage in pro-environmental behavior. Put another way, it would be useful to know at what times people may need more encouragement to engage in these actions.

In addition to investigating patterns and cycles of pro-environmental behavior, a multilevel approach could also help to understand exceptions to these patterns. For example, what circumstances may facilitate or inhibit pro-environmental behavior amongst people who typically do not engage in high levels of pro-environmental behavior? What are exceptional 'in-the-moment' influences of pro-environmental behavior? With a multilevel perspective, and using repeated measurements of relevant variables, it is possible to determine the causes of these atypical bouts of environmental engagement or disengagement. Knowing what takes place at particular moments of environmental decision-making could help with developing compelling prompts for use in marketing pro-environmental products and increasing pro-environmental behavior through interventions.

Undiscovered or Hidden Complexities in the Relationships between Pro-environmental Behavior and Other Factors

Previous research has established connections between pro-environmental behavior and a variety of other variables (e.g., attitudes), based on solid theoretical foundations. A multilevel perspective can extend this literature; it has the potential to reveal hidden complexities in these previously established relationships as well as to reveal yet undiscovered relationships between pro-environmental behavior and other variables. Simpson's paradox (Wagner, 1982) provides an example of how relationships can be 'hidden'. Simpson's paradox occurs when separate groups of data (e.g., multiple data points for individual people) show a different trend than the aggregated set of data (see Figure 2). An example from organizational psychology helps illustrate this point. Vancouver, Thompson, and Williams (2001) questioned the positive relationships between self-efficacy, personal goals, and performance typically found in cross-sectional studies (e.g., Stajkovic & Luthans, 1998). The general finding in cross-sectional studies is that employees with higher self-efficacy tend to have more ambitious goals and higher performance. Vancouver et al. (2001) conducted a study that focused on the within-person relationships between self-efficacy, personal goals, and performance and found results contrary to the cross-sectional data. They showed that when participants (playing a number of trials of a Mastermind game) experienced higher than average self-efficacy (i.e., higher than their personal average), this resulted in overconfidence and, therefore, lower performance. Thus, by adopting a multilevel perspective, Vancouver and colleagues showed that there can also be a negative relationship between self-efficacy and performance, which stands in contrast to the typically positive, between-person relationship found between the two constructs.

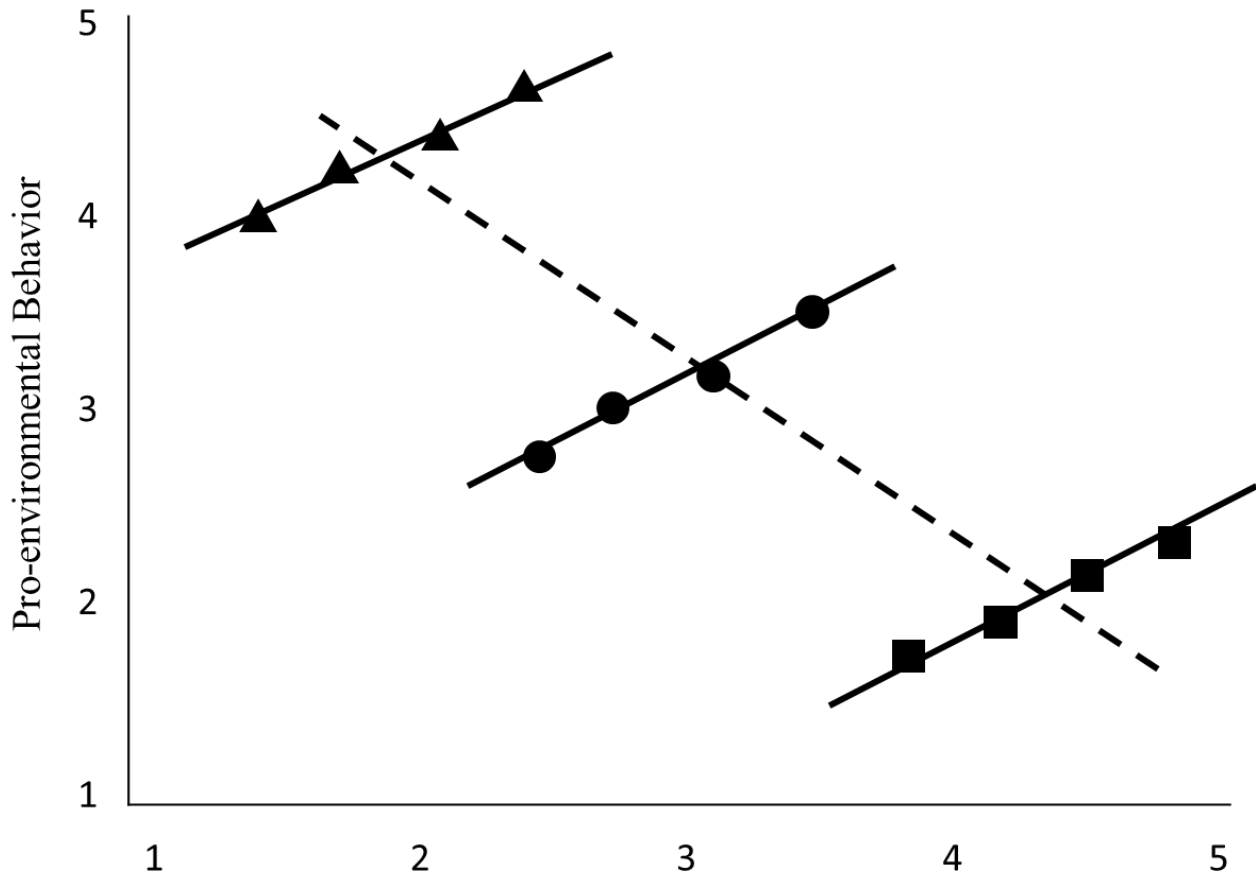


Figure 2. Simpson's paradox: The trend for the data from each person (triangle, circle, and square) is positive. In contrast, when the data from each person is aggregated and combined into one data set, the trend is negative.

Another example of how a multilevel perspective may uncover novel connections between pro-environmental behavior and other variables also comes from the organizational context. Bissing-Olson et al. (2013) employed a multilevel perspective to empirically investigate the potential, previously unstudied, relationship between pro-environmental behavior and transient emotions. The authors drew on the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001)—which posits that positive emotions expand a person's range of thoughts and actions and builds personal resources—to investigate relationships between employees' daily positive affect, pro-environmental attitude, and engagement in two types of daily pro-environmental behavior: task-related (i.e., completing required work tasks in environmentally friendly ways), and proactive (i.e., showing personal initiative when acting in environmentally friendly ways at work). The results showed that daily unactivated positive affect (e.g., feeling calm) and pro-environmental attitude were positively related to daily task-related pro-environmental behavior. Daily activated positive affect (e.g., feeling enthusiastic) was also positively related to daily proactive pro-environmental behavior, but only among employees with a less positive pro-environmental attitude. There was no relationship between activated positive affect and proactive pro-environmental

behavior among employees with a more positive pro-environmental attitude, possibly because employees who are already committed to the environment do not require the extra initiative that activated positive emotions provide. Taken together, the results reveal the important role played by *incidental* emotions (i.e., which are not specifically about environmental issues) in shaping pro-environmental behavior. The multilevel approach adopted in the study by Bissing-Olson et al. (2013) provided interesting insights into the complex relationship between emotions and pro-environmental behavior in the workplace that may have not otherwise been revealed.

At this point, we can only speculate about other ways that a multilevel perspective may uncover hidden complexities in the relationship between pro-environmental behavior and other constructs. As an example, research generally shows that greater concern for the natural environment is related to more pro-environmental behavior or stronger intentions to engage in environmentally-friendly behavior (e.g., Bamberg, 2003; Clark, Kotchen, & Moore, 2003). Potentially, however, there may be a different relationship between environmental concern and pro-environmental behavior when they are measured at different time points and these measurements are compared to each other *within a person*. It is possible that greater concern for the environment is associated with fluctuating feelings of optimism and pessimism so that at some points in time and in some contexts people are willing to engage in pro-environmental behavior whereas at other times (e.g., when they are faced with cues that focus them on the enormity of the problem and that governments are not taking action) they may feel that their contributions cannot make a difference. A multilevel approach could reveal the complexity of the concern-behavior relationship and the factors that may influence it in a way that cross-sectional research cannot. Researchers interested in how pro-environmental behavior relates to different factors within-people over time should be open to potential surprises and unexpected findings.

Methods for Studying Intra-individual Effects

A multilevel perspective on stability and change in pro-environmental behavior introduces a multitude of research questions that cannot be addressed using conventional methods, such as experiments or one-time cross-sectional studies. In this section, we describe the most appropriate way to operationalize a multilevel approach that incorporates intra-individual processes and between-person differences, in naturalistic contexts: intensive longitudinal methods.¹ In employing these methods, measurements of key variables (i.e., pro-environmental behaviors, antecedents, and/or consequences) are taken at multiple time-points over a set period. There are a variety of ways to collect data, each with its own advantages and disadvantages (see Table 2).

¹ This is the overarching term for a variety of specific methods for studying daily life (e.g., diary methods, experience sampling, ecological momentary assessment, and ambulatory assessment). For a description of the differences between these specific methods, see Bolger and Laurenceau (2013) and Mehl and Conner (2012).

Table 2

Research Methods for Studying Daily Experience

Method	Description of Method	Advantages	Disadvantages
Active methods	Experiences (e.g., moods, thoughts) and behaviors (e.g., energy conservation, transportation use) are self-reported by the participant	Gain access to experiences and behaviors that are only accessible to and observable by participants	Self-report data subject to possible reporting biases (e.g., different perceptions of what constitutes pro-environmental behaviors)
Experience sampling	Participants provide reports multiple times throughout the day (at semi-random or fixed time intervals)	Assesses ongoing experiences and reduces memory bias	May be burdensome for participants to provide such frequent reports
Daily diaries	Participants report on behaviors and/or experiences once a day at a fixed time	- Less burdensome than multiple reports - High compliance rates	Some degree of retrospection (e.g., recall of only key instances of pro-environmental behavior from the day)
Event sampling	Participants report on behaviors and/or experiences only after a predefined event (e.g., purchasing decision) occurs	- Can measure infrequent, discrete events and processes related to them - Retrospection greatly reduced	May increase participant reactivity if only negative aspects (as opposed to both positive and negative) of an event are reported on

(continued)

Method	Description of Method	Advantages	Disadvantages
Passive methods	Experiences and behaviors are inferred or measured through the use of devices such as the electronically activated recorder (auditory sampling), pedometer (physical activity), and GPS (physical location)	Participant not burdened with actively filling out a survey, etc.	- Participant needs to wear device continuously - Devices can be expensive
Acoustic sampling	Acoustic samples are taken from the participant's immediate environment (e.g., bird and traffic noises when outside or pieces of conversation with others)	- Naturalistic observation of objective physical and social environments and interactions - Samples taken unobtrusively	Relatively high evaluation apprehension due to privacy intrusions
Passive telemetrics	Unobtrusive technology (i.e., sensors worn on the body or embedded in the environment) wirelessly and automatically measures and transmits behavioral, physiological, and environmental data	Naturalistic observation of a range of objective phenomena (e.g., behavior, physiological responses, aspects of the physical environment such as temperature and physical location)	- Intrusions on participant privacy - Equipment and technology can be expensive

Note. Adapted from Conner and Lehman (2012). Supplemented with information from Gunthert and Wenze (2012), Moskowitz and Sadikaj (2012), Mehl and Robbins (2012), and Goodwin (2012).

In general, data can be collected actively or passively in terms of participant involvement (Conner & Lehman, 2012). *Active methods* ask participants to directly indicate their responses to the researcher (e.g., by completing a short daily questionnaire), whereas *passive methods* obtain measurements from participants using a device that operates independently (e.g., a GPS tracking device or heart rate monitor). The main difference between these two methods is the particular point of view that is being represented—that of the participant or that of the observer (Mehl & Robbins, 2012). Table 2 provides examples of various types of active methods including experience sampling, daily diaries, and event sampling and passive methods such as acoustic sampling and passive telemetrics.

Methods of data collection can also differ in terms of sampling strategies with four main types: variable time-based, fixed time-based, event-based, and continuous (Conner & Lehman, 2012). When using a *variable time-based strategy*, researchers direct participants to complete a report usually between four and ten times a day at semi-random times. The *fixed time-based strategy* also takes reports multiple times throughout the day, but here the reporting times are on a fixed schedule known to the participant. These sampling strategies are suited for studying phenomena that are ongoing (e.g., conscious awareness of environmental problems) or that could be affected by retrospective memory bias (e.g., actual engagement in pro-environmental behaviors). With both strategies, participants could report on pro-environmental behaviors and associated variables that are occurring at the moment of assessment or that have occurred since the previous assessment.

Event-based sampling is used when researchers are interested in relatively rare or discrete events (e.g., travel mode decisions, making ecological purchases), with participants making reports only after a predefined event has occurred. In contrast, researchers may use *continuous sampling* to passively capture ongoing experience, such as ambient noise or physiological experience (e.g., skin conductance as a measure of arousal or stress). Using this method, data is collected constantly, without gaps from the beginning to the end of the data collection period. To date, this strategy has been primarily used in health research (e.g., monitoring heart rates), but technological advances may enable researchers to use it in other areas of study. With respect to research on pro-environmental behavior, for instance, ambient noise recordings could be used as an objective measurement of context (e.g., the presence of other people). As argued previously in this paper, context may impact on whether and which types of pro-environmental behaviors are carried out.

When deciding on which study design to use, there are some considerations that need to be made. One consideration is how the frequency of questioning may impact on participants' responses. Asking in 'real-time' "constrains the multiple meanings of questions, reduces memory and estimation problems, and facilitates access to episodic detail" (Schwarz, 2012, p. 22). In the

case of affect, for example, when asked frequently, participants may report not only major incidents of anger felt, but also minor incidents. These minor episodes may be forgotten if participants are asked to report on their affect less frequently. This could apply to pro-environmental behavior as well, with participants recalling more minor behaviors when asked to complete more frequent reports.

An important consideration when using intensive longitudinal study designs is the lack of experimental control, which may impact on claims of causality. Because intensive longitudinal methods are employed in natural settings, experimental control is lacking. Therefore, intensive longitudinal methods may be better for understanding basic questions about intra-individual variability of pro-environmental behavior and the circumstances under which pro-environmental behavior occurs, as opposed to addressing questions of causality (Conner & Lehman, 2012). To remedy this issue somewhat, lagged analyses, which entail predicting behavior measured at a later time point (e.g., evening) by an experience measured at an earlier time point (e.g., noon), may be used to ascertain precedence.

There are many advantages to intensive longitudinal study designs. As Conner and Mehl (2012) note, they “allow researchers to study experience, behavior, environments, and physiology of individuals in their *natural settings*, in (close to) *real time*, and on *repeated occasions*” (p. xix). Intensive longitudinal methods maximize the ecological validity of a study and, thus, allow for the study of ‘real-world’ behavior. While there are issues to consider (e.g., how frequently to collect behavior reports), intensive longitudinal methods are ideal for addressing research questions arising from a multilevel perspective. These include questions relating to change, variability, duration, co-occurrence, and temporal patterns (Augustine & Larsen, 2012). In the section below, we suggest some research questions proceeding from a multilevel perspective on stability and change in pro-environmental behavior.

Suggestions for Future Research

Throughout the paper we have identified specific questions that relate to the broad types of information that can be gathered through the multilevel approach. In general, we have noted the importance of using this approach to better understand the variability of an individual’s pro-environmental behavior, as well as the influence of temporal patterns and social contexts on pro-environmental behavior. The potential for a multilevel approach to identify complex relationships amongst variables not previously identified has also been highlighted. In this section, we give further consideration to specific questions that could be addressed by researchers who adopt a multilevel approach to stability and change in pro-environmental behavior, with a particular emphasis on constructs that have received little attention in past literature and/or which may be better understood through adopting this approach.

The role of affect in relation to pro-environmental behavior has received little attention in the literature to date and may be particularly amenable to being investigated through a multilevel approach. As noted above, Bissing-Olson et al. (2013) have investigated the relationship between positive affect and pro-environmental behavior in the workplace. Another key emotion that may be important in relation to pro-environmental behavior is guilt. Research on how guilt and other similar emotions relate to pro-environmental behavior on a daily basis would complement the limited existing literature (e.g., Kals & Müller, 2012) on this topic: Feelings of moral responsibility (or personal obligation), for example, have been shown to be linked with greater pro-environmental behavior in general (e.g., Bamberg, Hunecke, & Blöbaum, 2007), but this relationship has not been examined on a day-to-day basis in real-world contexts. A multilevel approach could reveal, for example, whether individuals experience guilt from failing to engage in pro-environmental behavior and are thereby motivated to engage in positive future actions to compensate or whether they protect themselves from the effects of guilt through rationalizing their behavior. It could also explore whether responses (i.e., guilt or rationalization) vary as a result of factors such as social context. The multilevel approach, with its focus on intra-individual variability and intensive longitudinal methods, is particularly suited to addressing these questions as it can provide an in-depth and nuanced understanding of emotional and cognitive responses as they happen or close to when they happen.

The multilevel approach may also provide greater insight into processes of control and how they relate to pro-environmental behavior. Processes of control are important to consider: As proposed in the theory of planned behavior (Ajzen, 1991, 2012), control (or self-efficacy) is one of the fundamental predictors of pro-environmental behavior. Traditionally, self-efficacy has been treated as a between-person or inter-individual variable in pro-environmental behavior research. However, it is possible that a person may feel capable of carrying out a specific pro-environmental behavior (e.g., composting organic waste) on some days, but not on others due to fluctuations in daily stress levels or lack of infrastructure in some settings. This could be important information to uncover as negative experiences of control may be particularly aversive. Having even just one experience of low self-efficacy in relation to pro-environmental behavior might be enough to discourage further pro-environmental efforts. Again, a multilevel approach can provide insight into the variability in experiences of self-efficacy and the extent to which specific factors (temporal cycles, social contexts, specific task types) might influence this variability.

Research guided by the multilevel approach could also deepen our understanding of specific types of pro-environmental behavior. Consumer behavior, in particular, may benefit from a research approach that allows an examination of the factors that influence consumer decisions as they happen or close to when they happen. Traditional survey methods may not accurately assess

consumers' actual decisions (Auger & Devinney, 2007) and therefore fail to reflect the important influences on pro-environmental purchases. Event-contingent study designs could be used to examine the psychological processes related to environmental purchasing decisions in real time and in the actual settings in which they occur. This could shed light on momentary influences of consumer behavior, which could inform campaigns aimed at increasing purchases of green products.

A final topic that may be particularly amenable to exploring through a multilevel approach is the role of habit in relation to pro-environmental behavior. While diaries or log books have been employed in research on habitual transportation use (e.g., Klöckner & Matthies, 2004), these have been used in order to gain a more accurate measure of transportation use by aggregating the multiple (e.g., daily) measurements of behavior. This aggregation of measurements does not allow for an examination of within-person variation in behavior over time. For other pro-environmental behaviors, such as recycling, cross-sectional designs have been the dominant technique for data collection (e.g., Knussen, Yule, MacKenzie, & Wells, 2004). The use of intensive longitudinal methods to uncover intra-individual variation is ideal for studying habitual pro-environmental behaviors as these methods capture behavior as it occurs in close to real time. An important goal of research applying these methods could be to examine the psychological and contextual circumstances that facilitate the formation of habits as well as the exceptions to habits. This would be informative for environmental campaigns.

The questions that we have advanced here as well as those that we have raised throughout the paper are just a sampling of the possible research questions generated by a multilevel perspective on stability and change in pro-environmental behavior. We hope, though, that these examples may serve as an impetus for researchers interested in gaining a deeper understanding of pro-environmental behavior through examining both intra-individual processes and between-person differences in this type of behavior.

Conclusion

The multilevel perspective on stability and change in pro-environmental behavior is a novel approach that can extend theory and provide important practical information for environmental campaigns. Although this approach is growing in other areas of psychology, currently, almost no theoretical or empirical work applies a multilevel perspective to the study of pro-environmental behavior. Thus, this perspective can help shed light on factors and processes related to pro-environmental behavior that have not been previously explored. These include intra-individual variation and magnitude of variation in behavior, the influence of naturally-occurring contextual factors, temporal patterns or cycles, and, potentially, hidden complexities in the relationships between pro-environmental behavior and other factors yet unrevealed by conventional perspectives

and methods. We present suggestions for future research throughout the paper, but of course there are many more directions to explore—the wealth of new information that a multilevel perspective on stability and change in pro-environmental behavior can provide is yet untapped.

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CHAPTER 3

RELATIONSHIPS BETWEEN DAILY AFFECT AND PRO-ENVIRONMENTAL BEHAVIOR AT WORK: THE MODERATING ROLE OF PRO-ENVIRONMENTAL ATTITUDE

Abstract

Research in organizational psychology has increasingly focused on understanding the determinants of “green” employee behavior. However, no research to date has considered the relationship between employees’ daily affect and their pro-environmental behavior. The present study used a daily diary design to investigate relationships between employees’ daily affect, pro-environmental attitude, as well as daily task-related pro-environmental behavior (i.e., the extent to which employees complete required work tasks in environmentally-friendly ways) and daily proactive pro-environmental behavior (i.e., the extent to which employees show personal initiative when acting in environmentally-friendly ways at work). Fifty-six employees working in small businesses completed a baseline survey and two daily surveys over ten workdays. Daily unactivated positive affect and pro-environmental attitude positively predicted daily task-related pro-environmental behavior. In addition, daily activated positive affect positively predicted daily proactive pro-environmental behavior among employees with a less positive pro-environmental attitude but not among employees with a more positive pro-environmental attitude. These findings suggest that fostering pro-environmental attitudes and, to some extent, positive affect among employees could help organizations to promote pro-environmental behavior in the workplace.

Bissing-Olson, M. J., Iyer, A., Fielding, K. S., & Zacher, H. (2013). Relationships between daily affect and pro-environmental behavior at work: The moderating role of pro-environmental attitude. *Journal of Organizational Behavior*, 34(2), 151-171. doi: 10.1002/job.1788

Relationships between Daily Affect and Pro-environmental Behavior at Work: The Moderating Role of Pro-environmental Attitude

In the context of growing local and global concerns about significant environmental issues such as climate change, pollution reduction, and sustainability of natural resources, organizational psychologists have become increasingly interested in predicting “green” or pro-environmental employee behavior (e.g., Ramus & Steger, 2000; Russell & Griffiths, 2008; Scherbaum, Popovich, & Finlinson, 2008; Tudor, Barr, & Gilg, 2008). Pro-environmental behavior at work includes a broad range of actions such as recycling paper, printing double-sided, and conserving resources such as water and electricity (Lee, De Young, & Marans, 1995; Siero, Bakker, Dekker, & van den Burg, 1996). This is an important class of employee behaviors, because it facilitates organizational efforts to preserve natural resources and the environment (Andersson & Bateman, 2000), and thus promotes corporate social responsibility (Jones, 1996). Employees may carry out such environmentally-friendly behaviors during the process of completing their own required work tasks. In addition, they may also actively initiate broader environmentally-friendly changes in the policies and procedures in their workplace (Pichel, 2003; Ramus & Steger, 2000).

Previous studies that investigated the predictors of pro-environmental employee behavior have largely focused on stable differences *between* individuals. For example, research has found that attitudes and personality characteristics, such as personal norms and intrinsic motivation, influence pro-environmental employee behavior (e.g., Lee et al., 1995). However, the explanatory value of these studies is limited because they did not take fluctuations *within* individuals into account. That is, previous research has not accounted for the possibility that employees’ pro-environmental behavior may change over time, depending on the particular circumstances they are experiencing (e.g., changes in their affective experiences). Such within-person changes have already been shown for other important behaviors in the work context, such as task performance (Beal, Weiss, Barros, & MacDermid, 2005) and organizational citizenship behaviors (Rodell & Judge, 2009). Within-person factors can explain a significant amount of the variance in work behaviors; therefore, studies focusing solely on between-person differences neglect an important source of variability in behavior (Ohly, Sonnentag, Niessen, & Zapf, 2010). Furthermore, individual differences, such as pro-environmental attitude (Dunlap, Van Liere, Mertig, & Jones, 2000), may not only have main effects on pro-environmental behavior, but may also interact with within-person variables (e.g., different affective experiences over a number of days) to shape pro-environmental behavior. Thus, the overarching aim of the current study is to investigate the interplay between within-person and between-person variables in predicting pro-environmental behavior at work. Using this multilevel approach, our research extends current theorizing in an emerging research field of organizational psychology. In addition, this research may offer ideas for practical strategies

to better facilitate employees' pro-environmental behavior, and thus may help organizational efforts to protect the environment.

The first goal of this study is to examine within-person relationships between daily affect—i.e., individuals' emotional experiences about any target they may encounter in their day (Forgas, 1995; Loewenstein & Lerner, 2003)—and daily pro-environmental behavior in the workplace. Previous work has not addressed this question. Although some researchers have examined the link between emotion and pro-environmental behaviors at work, they have measured specific emotions about environmental targets (e.g., emotional intensity toward an environmental issue) rather than general emotions about non-environmental targets (Andersson, Giacalone, & Jurkiewicz, 2007; Fineman, 1996; Russell & Griffiths, 2008). We propose that daily affect has an important influence on daily pro-environmental behavior at work. We base this proposition on the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001), which suggests that the experience of positive affect has important implications for positive work behaviors (Fredrickson, 2003). In addition, our view is consistent with previous research showing that employees' affective experiences fluctuate over time (Fisher & Ashkanasy, 2000; Seo et al., 2010; Weiss & Cropanzano, 1996), and that these affective experiences influence a range of positive work behaviors, including creativity (Binnewies & Wörnlein, 2011), performance (Kluemper, Little, & DeGroot, 2009), and venture effort (Foo et al., 2009).

The second goal of this study is to investigate the role of pro-environmental attitude in predicting daily pro-environmental behavior, both independently of, and in interaction with, daily affect. Previous work has demonstrated that people who have a more positive pro-environmental attitude (i.e., are more concerned about the environment) are more likely to participate in actions to protect the environment (Bamberg & Möser, 2007; Hinds & Sparks, 2008; Kaiser et al., 1999). To our knowledge, however, no research has so far investigated how the between-person variable of pro-environmental attitude may operate alongside within-person variables, such as daily affect, to explain pro-environmental behavior. Such multilevel research is important because employees with more or less positive pro-environmental attitudes may act in more or less environmentally-friendly ways depending on their daily affect.

A third goal of our research is to provide a more nuanced analysis of employees' pro-environmental behaviors than currently exists in the literature. We distinguish between two types of daily pro-environmental behavior, drawing on the well-established concepts of task (or in-role) performance (Borman & Motowidlo, 1993; Williams & Anderson, 1991) and proactive work behavior (or personal initiative; Frese & Fay, 2001; Frese, Kring, Soose, & Zempel, 1996). Both of these types of pro-environmental behavior refer to the behavior of individuals. As such, neither type

involves large-scale organizational initiatives such as the use of alternative energy sources or workplace recycling systems (Ramus & Steger, 2000).

We conceptualize *task-related pro-environmental behavior* as the extent to which employees complete their required work tasks in environmentally-friendly ways. Thus, emphasis is placed on the degree to which the completion of expected core work tasks (or in-role behaviors; Williams & Anderson, 1991) involves the preservation of natural resources and protection of the environment. For example, a hairdresser who conserves water and electricity while cutting a client's hair shows high task-related pro-environmental behavior. In contrast, a financial consultant who prints a draft of a report using single-sided (rather than double-sided) paper shows low task-related pro-environmental behavior. Importantly, while the work tasks per se are required, the concept of task-related pro-environmental behavior reflects employees' discretion in determining the extent to which they carry out these tasks in environmentally-friendly ways.

We also introduce the concept of *proactive pro-environmental behavior*, which describes the extent to which employees take initiative to engage in environmentally-friendly behaviors that move beyond the realm of their required work tasks. Proactive behavior or personal initiative involves an active, self-starting approach to one's work which is not formally required; such actions include making constructive suggestions and changes, identifying problems and engaging in creative problem-solving, and overcoming barriers (i.e., dealing with potential challenges and setbacks) to improve existing processes (Frese & Fay, 2001; Frese et al., 1996). Our conceptualization of proactive pro-environmental behavior is similar to the concept of "ecopreneurship," which has been described as "an extraordinary type of behavior that derives not from an employee's job description or the management's requirements, but from personal engagement" (Pichel, 2003, p. 141). Examples of high proactive pro-environmental behavior include setting up a new recycling bin close to one's desk in order to make recycling easier or encouraging one's colleagues to switch off their computers before leaving work.

We conceptualize task-related and proactive pro-environmental behaviors as distinct, but related, forms of workplace behaviors. Both concepts refer to employees' discretionary environmentally-friendly actions in the workplace. However, the specific context in which each type of behavior occurs reflects an important distinction between them. Task-related pro-environmental behavior takes place within the context of employees' required core work tasks, whereas proactive pro-environmental behavior moves outside these narrow parameters and involves a more active, change oriented, and self-starting approach to environmental issues in the workplace.

Affect and Pro-environmental Behavior

Based on the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001), we hypothesize that daily positive affect will be positively related to daily pro-environmental behavior.

According to Fredrickson (2001), the experience of positive affect broadens the scope of people's possible thoughts and actions, and builds their personal resources. This, in turn, leads to greater engagement in alternative and positive workplace behaviors (Fredrickson, 2003). Numerous empirical studies have shown that positive affect predicts pro-social or altruistic behavior designed to serve the public good (e.g., George, 1991; Isen, 1999; Isen & Baron, 1991). Pro-environmental behavior can also be categorized as a helping behavior directed towards the environment, which is a public good (Griskevicius, Tybur, & Van den Bergh, 2010).

In order to determine the unique predictors of task-related and proactive pro-environmental behavior, we further differentiate between two types of daily positive affect based on level of activation or arousal. Broaden-and-build theory does not make differential predictions based on the level of activation of positive affect (Fredrickson, 1998, 2001). However, depending on the outcome variable, level of activation could play an important role. We distinguish between daily unactivated positive affect and daily activated positive affect (Larsen & Diener, 1992; Russell, 1980; Watson & Tellegen, 1985). Daily unactivated positive affect includes feelings of contentment, being at rest, and feeling relaxed, whereas daily activated positive affect involves feeling excited, euphoric, and enthusiastic. Daily unactivated and activated positive affect have been widely investigated in organizational research (e.g., Amabile, Barsade, Mueller, & Staw, 2005; Fritz & Sonnentag, 2009; Seo et al., 2010); however, to our knowledge, no work has examined their relationships to pro-environmental behavior.

Consistent with broaden-and-build theory, we propose that both daily unactivated and activated positive affect will be positively associated with daily task-related pro-environmental behavior. We expect that employees will carry out required work tasks in more environmentally-friendly ways when they are experiencing these types of positive affect because positive affect leads to an expansion of attentional focus (Derryberry & Tucker, 1994; Fredrickson, 1998). This, in turn, facilitates alternative and positive ways of thinking and acting and builds personal resources, such as energy levels and a sense of social responsibility (Fredrickson, 1998, 2001). The broadened thought-action repertoire and personal resources, in turn, should facilitate task-related pro-environmental behavior. In other words, we expect that employees who experience positive affect (e.g., contentment or enthusiasm) should be more likely to carry out their required work tasks in environmentally-friendly ways because they are more open to alternative and positive ways of thinking and acting and have more personal resources available for these behaviors.

Hypothesis 1a: Daily unactivated positive affect is positively related to daily task-related pro-environmental behavior.

Hypothesis 1b: Daily activated positive affect is positively related to daily task-related pro-environmental behavior.

We further propose that daily activated positive affect should be positively related to daily proactive pro-environmental behavior, whereas daily unactivated positive affect is not likely to be related to proactive pro-environmental behavior. The high level of arousal associated with activated positive affect should spark self-starting and change-oriented behaviors, including actions related to protecting the environment that cannot be induced by high levels of unactivated positive affect. Employees who feel excited and enthusiastic are more likely to show additional effort (Foo et al., 2009; Seo et al., 2004) and go above and beyond expectations (Bindl, Parker, Totterdell, & Hagger-Johnson, 2012; Parker et al., 2010; Seo et al., 2010). In the context of pro-environmental behavior, then, an employee who feels energetic and enthusiastic should be more likely to take initiatives such as setting up a new recycling bin or encouraging colleagues to also act in environmentally-friendly ways, compared to employees who do not experience activated positive affect.

Hypothesis 1c: Daily activated positive affect is positively related to daily proactive pro-environmental behavior.

Our hypotheses focus solely on the effects of daily positive affect, as we do not expect daily negative affect to be related to either type of daily pro-environmental behavior. This is because broaden-and-build theory argues that negative emotions narrow individuals' thought and action repertoires, and do not build personal resources beyond those already available (Fredrickson, 1998, 2001). Thus, daily negative affect should neither facilitate nor hinder positive work behaviors (Fredrickson, 2003). Our approach is consistent with research showing that positive affect predicted organizational citizenship behaviors, whereas negative affect did not (Lee & Allen, 2002). However, the same research has shown that high levels of negative affect may predict deviant work behaviors (Lee & Allen, 2002), which is consistent with theorizing on how emotions lead to specific action tendencies (Frijda, 1986; Frijda et al., 1989). Negative affective experiences (e.g., anger, fear)—usually in response to a threatening stimulus—narrow people's focus to specific, potential actions (e.g., attack, flee; Frijda, 1986; Frijda et al., 1989). For example, a threatening stimulus (e.g., unfair treatment) could trigger negative affective experiences such as aggression, which, in turn, could lead to workplace deviance (Bordia, Restubog, & Tang, 2008). As pro-environmental behaviors are positive and pro-social behaviors (Kollmuss & Agyeman, 2002; Steg & Vlek, 2009), we do not expect that activated or unactivated negative affect are related to daily pro-environmental behavior. In order to demonstrate that daily unactivated and activated positive affect are associated with pro-environmental behavior independently of negative affect, we control for both daily activated and unactivated negative affect in the analyses.

The Role of Pro-environmental Attitude

We expect that pro-environmental attitude, defined as a person's tendency to be concerned about the natural environment (Bamberg, 2003; Hawcroft & Milfont, 2010), is positively related to

daily pro-environmental behaviors at work. This prediction is consistent with the Theory of Planned Behavior (Ajzen, 1991), which proposes that attitudes influence behavior. Research based on this theory suggests that people who are more concerned about the environment should be more likely to act in ways to protect it (Andersson, Shivarajan, & Blau, 2005; Hinds & Sparks, 2008). Indeed, research has consistently shown that pro-environmental attitude is positively related to pro-environmental behavior (e.g., Bamberg & Möser, 2007; Kaiser et al., 1999).

There is some evidence that suggests that pro-environmental attitude may not only predict pro-environmental behaviors in general terms, but also in the workplace. Cordano and Frieze (2000) found that managers' pollution prevention attitudes were positively related to their intention to engage in pollution prevention behaviors. More recently, Cordano, Marshall, and Silverman (2010) found that managers' pro-environmental attitude influenced their intentions to implement environmental management programs. Extending this line of research further, we expect that pro-environmental attitude will positively predict both task-related and proactive pro-environmental behavior. Indeed, attitudes should best predict behavior when they have the same focus (i.e., the environment; Ajzen & Fishbein, 1977; Kraus, 1995).

Hypothesis 2a: Pro-environmental attitude positively predicts daily task-related pro-environmental behavior.

Hypothesis 2b: Pro-environmental attitude positively predicts daily proactive pro-environmental behavior.

We further suggest that pro-environmental attitude moderates the proposed relationships between daily positive affect and daily pro-environmental behavior. Specifically, we expect that these relationships are stronger for employees who have a less positive pro-environmental attitude than for employees who have a more positive pro-environmental attitude. When employees are generally more concerned about the environment, they should be more likely to carry out pro-environmental behaviors independent of how positive they are feeling on a particular day. On the other hand, employees who are generally less concerned about the environment should be more likely to carry out pro-environmental behaviors when they are feeling positive. This prediction is consistent with broaden-and-build theory (Fredrickson, 1998, 2001), which suggests that the experience of positive emotions broadens peoples' thought-action repertoires and, in turn, facilitates engagement in *alternative* and positive forms of behavior. Thus, employees with a less positive pro-environmental attitude may be more likely to act in environmentally-friendly ways when they experience positive affect, as these behaviors constitute alternative and positive ways of acting for these employees.

In contrast, employees with more positive pro-environmental attitudes should engage in pro-environmental behaviors regardless of their level of experienced positive affect. These employees

are likely to consistently act in environmentally-friendly ways, and therefore their environmentally-friendly behaviors constitute their daily routine, rather than alternative behavioral options. Among these individuals, positive affect may promote other types of positive behaviors that are truly novel for them (e.g., creativity).

Hypothesis 3a: Pro-environmental attitude moderates the positive relationship between daily unactivated positive affect and daily task-related pro-environmental behavior, such that the relationship is stronger when pro-environmental attitude is less positive and weaker when pro-environmental attitude is more positive.

Hypothesis 3b: Pro-environmental attitude moderates the positive relationship between daily activated positive affect and daily task-related pro-environmental behavior, such that the relationship is stronger when pro-environmental attitude is less positive and weaker when pro-environmental attitude is more positive.

Hypothesis 3c: Pro-environmental attitude moderates the positive relationship between daily activated positive affect and daily proactive pro-environmental behavior, such that the relationship is stronger when pro-environmental attitude is less positive and weaker when pro-environmental attitude is more positive.

An overview of all hypothesized relationships is presented in Figure 1.

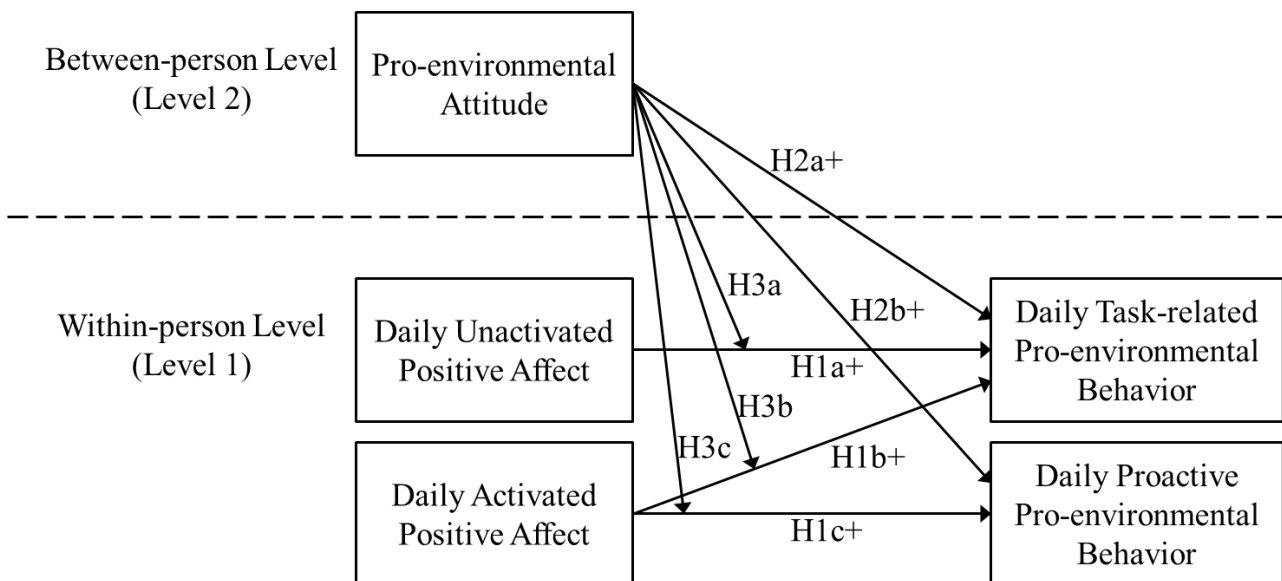


Figure 1. Overarching model and hypotheses.

Method

Participants and Procedure

Fifty-six employees from a range of organizations participated in a daily diary study over a period of 10 consecutive workdays. Eighteen participants (32.1%) were male and 38 (67.9%) were female. Age ranged from 19 years to 64 years ($M = 38.5$ years, $SD = 13.3$) and organizational tenure ranged from two months to 24 years ($M = 5.2$ years, $SD = 6.2$). Nineteen participants

(33.9%) indicated high school as their highest level of education, 13 held a Technical and Further Education (TAFE) degree (23.2%), 17 held an undergraduate university degree (30.4%), five held a postgraduate university degree (8.9%), and two (3.6%) indicated “other” as their highest level of education (i.e., “diploma” and “private certifications”).

Participants worked in a wide range of jobs (e.g., shop assistant, architect, legal secretary, and hairdresser). We classified their job descriptions according to the categories provided by the Occupational Information Network (O*NET; Peterson et al., 2001). Eighteen employees (32.1%) worked in retail trade occupations; 15 (26.8%) in professional, scientific, and technical services; five (8.9%) in healthcare and social assistance; five (8.9%) in information occupations; four (7.1%) in real estate, rental, and leasing; and the remaining seven employees (12.6%) worked in manufacturing; services except public administration; finance and insurance; arts, entertainment, and recreation; and administrative, support, and waste (two employees [3.6%] did not indicate their job description). We also asked participants to report the industry that their company was in and categorized their responses according to the Standard Industrial Classification (SIC) of the United States Department of Labor (2011). Out of the 10 primary SIC divisions, four were represented in our sample (not represented were agriculture, forestry, and fishing; mining; construction; transportation, communications, electric, gas, and sanitary services; wholesale trade; and public administration). Thirty employees (53.6%) worked in services, 18 (32.1%) in retail trade, four (7.1%) in finance, insurance, and real estate; two (3.6%) in manufacturing; and two (3.6%) did not indicate the industry of their company. Non-parametric Kruskal-Wallis tests showed that there were no significant differences between these groups in daily task-related pro-environmental behaviors aggregated to the person-level ($\chi^2 = 6.01$, $df = 4$, $p = .198$) and in daily proactive pro-environmental behaviors aggregated to the person-level ($\chi^2 = 5.81$, $df = 4$, $p = .214$).

Participant recruitment took place within four suburbs of a major metropolitan area in eastern Australia. The first author went door-to-door to small and medium-sized businesses accessible to the public. After introducing the broad topic of the study (title: “A Daily Diary Study on Pro-Environmental Behaviors at Work”) and requirements for participation, the researcher asked if one or more employees from the business would like to participate in the study. Participants received a survey booklet and a reply-paid envelope. They were instructed to first fill out a one-time baseline survey on the following weekend, followed by ten workdays of twice-daily surveys. All surveys were completed in paper-and-pencil format. In total, 421 businesses were approached and 129 employees from 115 businesses initially agreed to participate. The number of participating employees from each business ranged from one to five (in seven businesses more than one employee agreed to participate). Of the 129 employees who initially agreed to participate, 58 employees returned survey booklets (44.9% response rate). Due to the anonymous nature of the

study, we do not know how many employees from each business actually returned their survey booklets. Two participants were excluded from the analyses due to insufficient data at the daily level (i.e., they answered the daily survey on less than three days), resulting in usable data from 56 baseline surveys and 910 daily surveys. Thus, on average, participants completed the daily surveys on eight out of ten possible days.

The baseline survey assessed pro-environmental attitude. The first daily survey assessed daily affect, and the second daily survey assessed daily pro-environmental behaviors. The daily surveys were to be filled out between 11 a.m. and 2 p.m. and between 4 p.m. and 8 p.m., respectively. Participants received reminders twice daily by email or text message to fill in the daily surveys.

Baseline Survey Measure

Pro-environmental attitude. Pro-environmental attitude was measured using the New Ecological Paradigm (NEP) Scale (Dunlap & Van Liere, 1978; Dunlap et al., 2000), the most widely-used measure of pro-environmental attitude since it was first published in 1978 (Hawcroft & Milfont, 2010). The NEP Scale includes 15 items (seven reverse scored) that measure the extent to which a person possesses an ecological worldview (e.g., a concern for the natural environment and recognition that humans are altering natural processes in the environment). The NEP Scale is a highly reliable and valid measure of pro-environmental attitude (Dunlap et al., 2000). Consistent with recommendations by Dunlap et al. (2000), a single pro-environmental attitude factor was computed by averaging the 15 items. Example items are “The balance of nature is very delicate and easily upset” and “If things continue on their present course, we will soon experience a major ecological catastrophe.” Participants indicated their level of agreement with each item on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The scale had good reliability ($\alpha = .86$).

Daily Survey Measures

Daily affect was measured using 16 items from the self-report circumplex scale (Larsen & Diener, 1992). This affect scale assesses four sets of affective experiences which are organized around two dimensions: hedonic valence (i.e., positive or negative) and activation level (i.e., activated/high arousal or unactivated/low arousal). The four items used to measure *daily activated positive affect* were enthusiastic, elated, excited, and euphoric ($\alpha = .89$); four items measured *daily unactivated positive affect*: relaxed, content, at rest, and calm ($\alpha = .91$); four items measured *daily activated negative affect*: distressed, annoyed, fearful, and nervous ($\alpha = .81$); and four items measured *daily unactivated negative affect*: dull, tired, drowsy, and sluggish ($\alpha = .89$). Participants were instructed to indicate the extent to which they felt each item on a particular day using a five-point scale from 1 (*very slightly or not at all*) to 5 (*extremely*).

In order to test whether the 16 items used to assess daily affect represent four distinct affective dimensions, we conducted confirmatory factor analyses with data from the first daily survey. We tested two models²: our hypothesized four-factor model and a one-factor model reflecting undifferentiated affect. The four-factor model had a satisfactory fit to the data ($\chi^2 = 145.55$, $df = 98$, $p = .001$, confirmatory fit index [CFI] = .92, root mean squared error of approximation [RMSEA] = .09). The four-factor model also fit the data significantly better than the one-factor model ($\chi^2 = 451.57$, $df = 104$, $p < .001$, CFI = .40, RMSEA = .25; $\Delta\chi^2 = 306.02$, $\Delta df = 6$, $p < .001$).

Daily pro-environmental behavior. *Daily task-related pro-environmental behavior* was measured using three items adapted from Williams and Anderson's (1991) reliable and well-validated employee in-role performance measure. In order to assess the extent to which employees' required work tasks were completed in environmentally-friendly ways, we adapted Williams and Anderson's (1991) measure by adding the phrase "in environmentally-friendly ways" to each item. The adapted items are "Today, I adequately completed assigned duties in environmentally-friendly ways," "Today, I fulfilled responsibilities specified in my job description in environmentally-friendly ways," and "Today, I performed tasks that are expected of me in environmentally-friendly ways." Participants indicated how often they engaged in the behaviors described in each item using a five-point scale ranging from 1 (*never*) to 5 (*always*). The scale had high reliability ($\alpha = .97$).

Daily proactive pro-environmental behavior at work was measured using three adapted items from Frese, Fay, Hilburger, Leng, and Tag's (1997) widely-used, reliable, and well-validated personal initiative scale. These items were adapted so that they could be used to measure proactive pro-environmental behavior in the work context by adding the words "at work," "environmental protection," "environmentally-friendly ways," and "for the environment" to each item. The three adapted items used to measure daily proactive pro-environmental behavior are "Today, I took a chance to get actively involved in environmental protection at work," "Today, I took initiative to act in environmentally-friendly ways at work," and "Today, I did more for the environment at work than I was expected to." Responses were given on a five-point scale ranging from 1 (*never*) to 5 (*always*). Cronbach's alpha of the scale was .83.

To test whether task-related pro-environmental behavior and proactive pro-environmental behavior are distinct constructs, we conducted confirmatory factor analyses with data from the first

² We also tested a third model with two factors in response to a suggestion made by a thesis examiner. The results reported below are not reported in the original text of the published paper.

The four-factor model reported above fit the data significantly better than a two-factor model with positive affect (i.e., activated and unactivated positive affect combined) and negative affect (i.e., activated and unactivated negative affect combined) as the two factors ($\chi^2 = 332.65$, $df = 103$, $p < .001$, CFI = .57, RMSEA = .21; $\Delta\chi^2 = 187.10$, $\Delta df = 5$, $p < .001$).

daily survey. We tested two models, including a two-factor model with the hypothesized items loading on each factor and an undifferentiated one-factor model using all items. The two-factor model had an excellent fit ($\chi^2 = 3.17$, $df = 8$, $p = .923$, CFI = 1.00, RMSEA = .00) and fit the data significantly better than the one-factor model ($\chi^2 = 49.50$, $df = 9$, $p < .001$, CFI = .87, RMSEA = .29; $\Delta\chi^2 = 46.33$, $\Delta df = 1$, $p < .001$). Thus, there is evidence that participants distinguished between the two types of daily pro-environmental behaviors.

Overview of Analyses

The data collected in this daily diary study have a multilevel structure, with predictors at both the within-person and between-person levels. In order to account for variance explained by predictors from both levels simultaneously, we conducted our analyses using hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002; Raudenbush, Bryk, & Congdon, 2004). The between-person level variable, pro-environmental attitude, was centered at the grand mean. All within-person level predictor variables were centered at each person's mean (Hofmann, Griffin, & Gavin, 2000). This removes all between-person variance in the within-person level variables, which means that the results of the HLM analyses for the within-person variables as predictors cannot be due to between-person differences.

We included daily activated and unactivated negative affect as well as the respective other type of daily pro-environmental behavior in the HLM models as control variables, because this provides a more robust test of the proposed relationships and identifies the unique effects of the predictor variables on each outcome variable independent of the respective other outcome variable. It is important to note, however, that the pattern of results was equivalent to the results reported below when we ran the analyses without these control variables.

Results

Table 1 presents the means, standard deviations, and the within- and between-person correlations of the study variables. Before conducting HLM analyses, we first computed the intraclass correlation coefficients (ICCs) in order to determine whether there was significant between-person variance, and, thus, whether HLM is an appropriate method of analysis (Hofmann et al., 2000)³. For daily task-related pro-environmental behavior, 71 percent of the variance resided between people ($\tau_{00} = .58$, $p < .001$, $\sigma^2 = .24$). For daily proactive pro-environmental behavior, 66 percent of the variance resided between people ($\tau_{00} = .64$, $p < .001$, $\sigma^2 = .33$). The significant between-person variance for both outcome variables indicated that HLM analyses were appropriate.

³ The ICC is calculated by dividing the between-person variance component (τ_{00}) of the null model (i.e., the model with no predictors at Level 1 or at Level 2) by the sum of τ_{00} and the within-person variance component (σ^2) of the null model. The result is the percentage of the between-person variance compared to the total variance.

Effects of Daily Affect on Daily Pro-environmental Behavior

Consistent with Hypothesis 1a, daily unactivated positive affect positively and significantly predicted daily task-related pro-environmental behavior ($\gamma = .12, p = .005$; see Table 2). Contrary to Hypothesis 1b, daily activated positive affect did not significantly predict daily task-related pro-environmental behavior ($\gamma = -.02, p = .552$; see Table 2). Hypothesis 1b was therefore not supported. Hypothesis 1c was also not supported: Table 2 shows that daily activated positive affect did not significantly predict daily proactive pro-environmental behavior ($\gamma = .07, p = .160$).

Table 1

Means (M), Standard Deviations (SD), and Correlations of Study Variables

Variable	<i>M</i>	<i>SD</i>	α	1	2	3	4	5	6	7
<i>Within-person variables</i>										
1. Daily activated positive affect	2.27	0.72	.89	—	.38**	-.08	-.27**	.24**	.20**	
2. Daily unactivated positive affect	2.96	0.80	.91	.34*	—	-.40**	-.21**	.07	-.02	
3. Daily activated negative affect	1.25	0.37	.78	.06	-.50**	—	.42**	.21**	.18**	
4. Daily unactivated negative affect	1.67	0.61	.88	-.23	-.15	.52**	—	-.02	.08	
5. Daily task-related pro-environmental behavior	3.31	0.78	.97	.36**	.05	.34*	-.01	—	.50**	
6. Daily proactive pro-environmental behavior	2.47	0.83	.83	.28*	-.04	.30*	.10	.59**	—	
<i>Between-person variable</i>										
7. Pro-environmental attitude	3.56	0.57	.86	-.11	-.14	.18	.32*	.28*	.27*	—

Note. Cronbach's alpha for within-person variables are mean internal consistencies averaged over all measurement days. Correlations below the diagonal are between-person correlations ($N = 56$). Correlations above the diagonal are within-person (level 1) correlations ($N = 455$).

* $p < .05$. ** $p < .01$

Table 2

HLM Results for Models Predicting Daily Task-related Pro-environmental Behavior and Daily Proactive Pro-environmental Behavior

Predictor	DV: Daily Task-related Pro-environmental Behavior				DV: Daily Proactive Pro-environmental Behavior			
	Model 1		Model 2		Model 1		Model 2	
	γ	SE_{γ}	γ	SE_{γ}	γ	SE_{γ}	γ	SE_{γ}
Intercept	3.31**	.10	3.31**	.10	2.48**	.11	2.48**	.11
<i>Level 1 (within-person)</i>								
Daily task-related pro-environ. behavior	—	—	—	—	.28**	.06	.27**	.06
Daily proactive pro-environ. behavior	.20**	.04	.20**	.04	—	—	—	—
Daily activated positive affect	-.02	.04	-.03	.04	.07	.05	.07	.05
Daily unactivated positive affect	.12**	.04	.10*	.04	.01	.05	.03	.05
Daily activated negative affect	.05	.07	.09	.07	-.12	.08	-.14	.09
Daily unactivated negative affect	-.04	.04	-.03	.04	.03	.05	.03	.05
<i>Level 2 (between-person)</i>								
Pro-environmental attitude	.37*	.18	.37*	.18	.38*	.19	.38*	.19
<i>Cross-level moderation</i>								
Daily activated positive affect × Pro-environmental attitude			.04	.08			-.32**	.09
Daily unactivated positive affect × Pro-environmental attitude			.07	.07			.09	.09
Daily activated negative affect × Pro-environmental attitude			-.18	.13			-.01	.16
Daily unactivated negative affect × Pro-environmental attitude			.04	.07			.01	.09

Note. HLM = hierarchical linear modeling; γ = unstandardized coefficient; SE_{γ} = standard error of γ .

* $p < .05$. ** $p < .01$.

Effects of Pro-environmental Attitude on Daily Pro-environmental Behavior

Consistent with Hypothesis 2a, pro-environmental attitude positively and significantly predicted daily task-related pro-environmental behavior ($\gamma = .37, p = .043$; see Table 2). Hypothesis 2b was also supported, as pro-environmental attitude positively and significantly predicted daily proactive pro-environmental behavior ($\gamma = .38, p = .048$; see Table 2).

Cross-Level Interaction Effects of Pro-environmental Attitude on the Relationships between Daily Affect and Daily Pro-environmental Behavior

According to Hypothesis 3a, pro-environmental attitude has a moderating effect on the relationship between daily unactivated positive affect and daily task-related pro-environmental behavior, such that the relationship is stronger when pro-environmental attitude is less positive than when pro-environmental attitude is more positive. As shown in Table 2, no significant interaction effect on daily task-related pro-environmental behavior was found ($\gamma = .07, p = .341$). Thus, Hypothesis 3a was not supported.

According to Hypothesis 3b, pro-environmental attitude has a moderating effect on the relationship between daily activated positive affect and daily task-related pro-environmental behavior, such that the relationship is stronger when pro-environmental attitude is less positive than when pro-environmental attitude is more positive. As shown in Table 2, no significant interaction effect on daily task-related pro-environmental behavior was found ($\gamma = .04, p = .603$). Thus, Hypothesis 3b was also not supported.

Finally, Hypothesis 3c predicted that pro-environmental attitude has a moderating effect on the relationship between daily activated positive affect and daily proactive pro-environmental behavior, such that the relationship is stronger when pro-environmental attitude is less positive than when pro-environmental attitude is more positive. A significant interaction effect was found ($\gamma = -.32, p = .001$). To test whether this significant interaction effect was also consistent with the hypothesized pattern, we utilized simple slope analysis for cross-level interactions (Preacher, Curran, & Bauer, 2006). Consistent with expectations, the simple slope for employees with a less positive pro-environmental attitude (i.e., one standard deviation below the mean) was positive and significant ($B = .26, SE = .07, t = 3.52, p < .001$), whereas the simple slope for employees with a more positive pro-environmental attitude (i.e., one standard deviation above the mean) was weak and non-significant ($B = -.11, SE = .07, t = 1.57, p = .116$). Together, these findings support Hypothesis 3c. The interaction effect is shown in Figure 2.

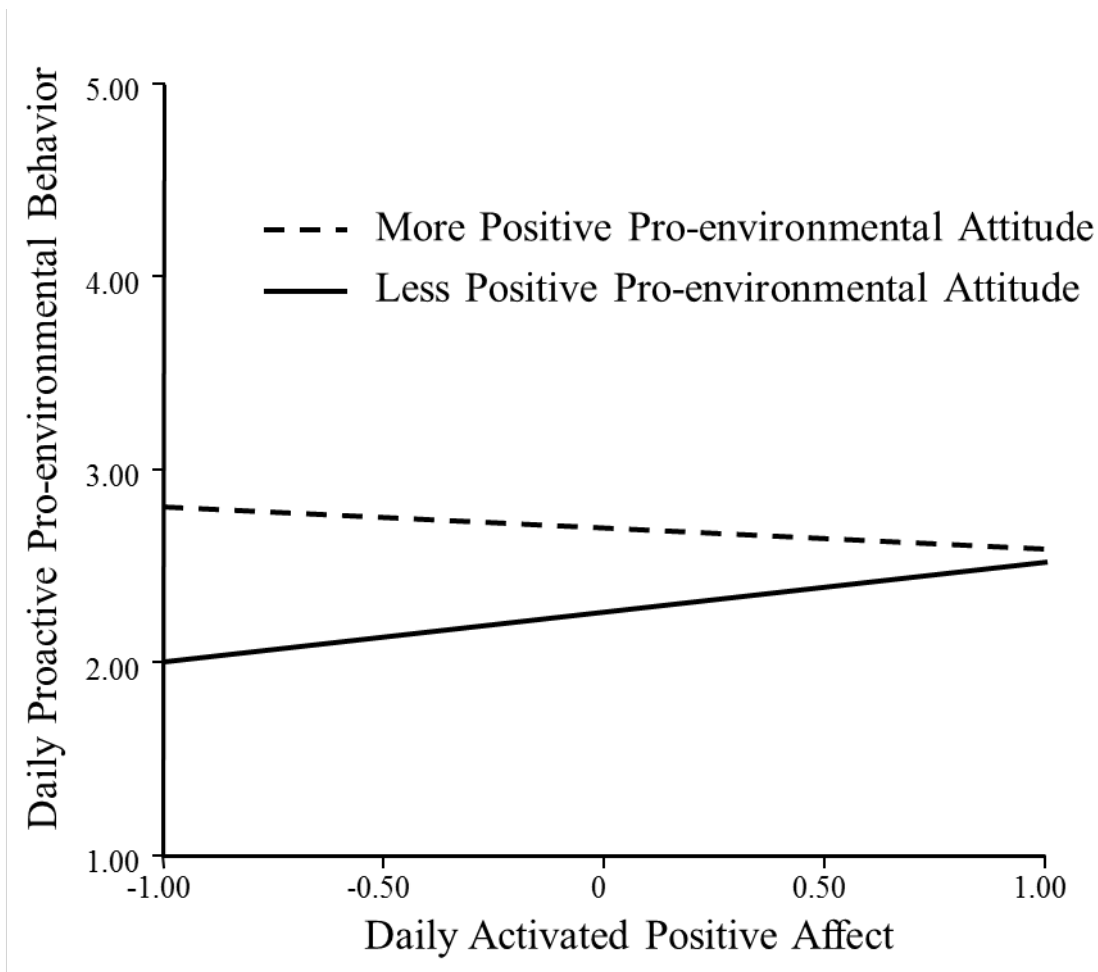


Figure 2. Graph of the interactive effect of pro-environmental attitude on the relationship between daily activated positive affect and daily proactive pro-environmental behavior.

Discussion

Organizational researchers and practitioners have become increasingly interested in explaining when and why individuals engage in pro-environmental behavior at work (e.g., Jackson & Seo, 2010; Russell & Griffiths, 2008; Scherbaum et al., 2008; Tudor et al., 2008). However, daily pro-environmental employee behaviors and their predictors are so far not well understood. The present research helps address this gap by investigating relationships between within-person and between-person variables and pro-environmental behavior at work. Specifically, we examined the extent to which two types of daily positive affect (unactivated and activated) and pro-environmental attitude independently predicted two types of daily pro-environmental behavior (task-related and proactive). We further investigated whether pro-environmental attitude moderated the relationships between daily positive affect and daily pro-environmental behavior.

Consistent with our predictions, unactivated positive affect was positively related to daily task-related pro-environmental behavior (Hypothesis 1a). That is, the more employees felt calm, relaxed, content, the more they carried out their required work tasks in environmentally-friendly ways. This finding accords with broaden-and-build theory (Fredrickson, 1998, 2001), which

suggests that positive affect builds personal resources and facilitates helping behavior. Our findings show that this reasoning can be extended to workplace settings and to the study of pro-environmental behavior. To our knowledge, this is the first evidence that individuals' incidental daily affect—which can be about any target—plays an important role in explaining pro-environmental behavior at work.

Our predictions that pro-environmental attitude would be positively related to task-related and proactive pro-environmental behaviors were also supported (Hypotheses 2a and 2b). For both types of behavior, employees with more positive attitudes toward the environment reported more pro-environmental behaviors. This is consistent with general findings in relation to pro-environmental attitudes and behavior (Ajzen, 1991; Bamberg & Möser, 2007; Hinds & Sparks, 2008). Within organizational settings, our study extends previous cross-sectional research on the links between managers' pro-environmental attitudes and behavior (Cordano & Frieze, 2000; Cordano et al., 2010) by showing that pro-environmental attitude also predicts daily employee behaviors.

Not only did pro-environmental attitude directly predict pro-environmental behaviors, it also moderated the influence of activated positive affect on proactive pro-environmental behavior. Consistent with Hypothesis 3c, activated positive affect was positively related to daily proactive pro-environmental behavior when employees had less compared to more positive pro-environmental attitudes. Thus, employees with less positive attitudes toward the environment were more likely to engage in proactive pro-environmental behavior when they were feeling activated positive emotions, such as enthusiasm and excitement. This moderation effect is consistent with broaden-and-build theory (Fredrickson, 1998, 2001), which suggests that the experience of positive affect encourages alternative and positive forms of behavior. Engaging in proactive pro-environmental behaviors may represent such an alternative and positive form of behavior for employees who are not as concerned with environmental issues. In contrast, for employees who are more concerned with environmental issues, the experience of positive affect may not serve the same purpose as they engage more in these behaviors in the first place. The moderation effect could also explain why we did not find a direct effect of daily activated positive affect (Hypothesis 1c): If daily activated positive affect is associated with daily proactive pro-environmental behavior only when pro-environmental attitudes are less positive, then its overall direct effect is by definition weaker. Thus, employees who are more concerned about the environment (i.e., have more positive attitudes) may take advantage of opportunities for proactive behavior independent of their daily affect because they are more interested in these issues.

There were also some unexpected findings. Contrary to expectations, daily activated positive affect was not associated with daily task-related pro-environmental behavior, either directly

(Hypothesis 1b), or in conjunction with pro-environmental attitude (Hypothesis 3b). Instead, these types of emotions were related to proactive pro-environmental behavior, and only when pro-environmental attitude was less positive (Hypothesis 3c). A potential explanation for the null relationship between activated positive affect and task-related pro-environmental behavior comes from the emotion literature (Fredrickson, 1998, 2001; Frijda et al., 1989; Izard, 1977). Appraisal theory posits that distinct affective experiences may be associated with specific types of action; for example, fear triggers a response to fight or flee, and sympathy for those who are suffering motivates efforts to help. In her broaden-and-build theory, Fredrickson (1998) also suggests that different categories of positive emotions (i.e., love, interest, contentment, and joy) may prompt responses unique to each respective emotion category. The emotion of interest, for example, may spark an impulse to explore (Izard, 1977), whereas the emotion of contentment may evoke reflection and a tendency to see connections (e.g., between events; De Rivera et al., 1989; Izard, 1977). This could explain why feeling relaxed, content, and calm (i.e., unactivated positive affect) may be more likely to facilitate environmentally-friendly behaviors within the context of employees' required work tasks (i.e., task-related pro-environmental behavior). That is, these emotions may encourage employees to reflect on, and see connections between, their required work tasks and environmentally-friendly behaviors. In contrast, feeling excited and enthusiastic (i.e., activated positive affect) may be more important for workplace behaviors that require higher levels of personal initiative (Bindl et al., 2012). In essence, activated positive affect not only broadens an employee's perspective, but also provides the energy needed to display higher levels of personal initiative.

We can draw on this same reasoning to explain why pro-environmental attitude moderated the relationship between activated positive affect and daily proactive pro-environmental behavior (Hypothesis 3c), but not the relationship between unactivated positive affect and daily task-related pro-environmental behavior (Hypothesis 3a). Just as different types of positive affect evoke specific types of responses, they may also interact differently with other influencing factors, such as pro-environmental attitude. Thus, daily unactivated positive affect and pro-environmental attitude may present two independent pathways to increasing daily task-related pro-environmental behavior, with little overlap between the two. In contrast, daily activated positive affect may be more likely to interact with pro-environmental attitude in facilitating daily proactive pro-environmental behavior. Taken together, these unexpected findings offer interesting avenues for further theory development and empirical studies. For instance, future work may consider the potential for different combinations of daily emotions and attitudes to be linked to different types of daily pro-environmental behaviors.

Theoretical Implications

Pro-environmental employee behavior represents an emerging research field in organizational psychology (e.g., Scherbaum et al., 2008; Tudor et al., 2008), and the multilevel, multi-facet approach taken in this study may facilitate theory development in this area in at least four important ways. First, the present research suggests that theories of pro-environmental employee behavior should take into account daily affective experiences. While organizational psychology theories increasingly emphasize the importance of daily affect for employee behavior (Beal et al., 2005; Seo et al., 2010; Weiss & Cropanzano, 1996), past research on affect and pro-environmental behavior has only examined how affective experiences that are directly related to the environment are linked to pro-environmental behavior (e.g., Fineman, 1996; Russell, 2008). These types of affective experience are closely tied to individuals' general pro-environmental attitudes (Petty, Fabrigar, & Wegener, 2003), and thus the independent influence of affect may not be easily teased apart. In contrast, the present study found that certain affective experiences unrelated to environmental issues were associated with pro-environmental behavior. This is consistent with other recent research on relationships between daily affect and work behaviors (e.g., Fritz & Sonnentag, 2009).

We also found support for the importance of distinguishing between activated and unactivated positive affect. These two types of affect had distinct patterns of associations with task-related and proactive pro-environmental behaviors. Conceptually, this adds a layer of complexity to broaden-and-build theory (Fredrickson, 1998, 2001), suggesting that different types of positive emotion (i.e., activated vs. unactivated) may operate in distinct ways. Our findings may also encourage further theory development in other areas of organizational psychology, as most theories on affect so far distinguish only between positive and negative but not between activated and unactivated affect (e.g., Bledow, Schmitt, Frese, & Kühnel, 2011; Weiss & Cropanzano, 1996). In the same way that different levels of activated positive affect are related to different types of pro-environmental behavior, this pattern may also emerge for other types of organizational behavior.

Second, our finding of an interactive effect between daily activated positive affect and pro-environmental attitude on daily proactive pro-environmental behavior may contribute to the development of more complex, multilevel models of pro-environmental behavior that consider both within- and between-person factors. We used broaden-and-build theory (Fredrickson, 1998, 2001) to explain the positive relationship between activated positive affect and proactive pro-environmental behavior among employees with a less positive compared to a more positive pro-environmental attitude. Future theorizing and research in this area, however, could focus on different or more nuanced aspects of pro-environmental attitude and how these aspects relate to relationships between daily affect and pro-environmental behavior. For example, in an early cross-

sectional study on affect and recycling behavior, Smith, Haugvedt, and Petty (1994) suggested that the concept of attitude strength (i.e., the degree to which attitudes are persistent over time, resistant to change, and have a strong impact on information processing and behavior; Krosnick & Petty, 1994) may moderate the relationships between affective experiences and pro-environmental behavior. They argued that people with a weak attitude may be more susceptible to their affective experiences when making decisions (see also Greifeneder, Bless, and Pham [2011] for a recent review on affect-cognition interactions).

Third, our study may contribute further to theory development by distinguishing between two types of daily pro-environmental behavior relevant to the workplace. As no established taxonomy of pro-environmental employee behaviors currently exists, we conceptualized these behaviors consistent with well-established theories of task performance and proactive behavior in organizational psychology (Frese & Fay, 2001; Williams & Anderson, 1991) as well as theories of individual-level environmentalism (Pichel, 2003). We showed that employees' task-related and proactive pro-environmental behaviors represent related, yet distinct forms of pro-environmental employee behavior. These two relatively broad types of pro-environmental employee behavior constitute a theoretical advancement over previous research, which has focused on more specific pro-environmental behaviors (e.g., paper recycling; Lee et al., 1995). That is because more integrative behavioral criteria (i.e., measures of behavior encompassing a range of specific behaviors) can be better predicted by person factors (e.g., affect and attitudes) that are conceptualized at a similar level of specificity (Harrison, Newman, & Roth, 2006).

Finally, conceptualizing pro-environmental behavior at the employee- and day-levels (i.e., between- and within-person levels) complements organizational-level research on green policies, sustainability, and corporate social responsibility (e.g., Arnaud & Sekerka, 2010). By using a daily diary design, we were able to show that approximately one third of the variance in daily pro-environmental behaviors could potentially be explained by within-person variables, such as daily affect. Future research could investigate additional within-person predictors of pro-environmental employee behaviors and explore the implications of daily pro-environmental behaviors for other workplace outcomes, such as job satisfaction and organizational-level environmentalism.

Practical Implications

As this study represents an initial step in investigating relationships between daily affect, pro-environmental attitude, and employees' pro-environmental behavior, our practical recommendations are necessarily tentative. First, our findings highlight the importance of employees' pro-environmental attitudes in facilitating workplace pro-environmental behavior. We found that a more positive pro-environmental attitude was related to both higher task-related and proactive pro-environmental behavior at work. Thus, pro-environmental attitude emerged as the

most consistent predictor of pro-environmental behavior in our study. Organizations could increase their employees' daily pro-environmental behavior by selecting on and promoting pro-environmental attitudes. Although employees may have pre-existing environmental attitudes that they bring to the workplace, creating an organizational climate that supports environmental protection will also likely promote positive environmental attitudes amongst employees (Fineman, 1996; Russell & Griffiths, 2008).

Second, our results suggest the importance of creating workplaces that promote positive affect and thereby increase the likelihood that employees engage in different types of pro-environmental behavior. The current research along with past research demonstrates that work environments that promote positive affect could have multiple benefits, increasing not only employees' pro-environmental behavior, but also their creativity (Baas, De Dreu, & Nijstad, 2008), task performance (Brief & Weiss, 2002), and organizational citizenship behavior (Rodell & Judge, 2009). The current research suggests that inducing negative affect, such as fear, is unlikely to encourage employees to engage in pro-environmental behaviors. Instead, our findings suggest that organizations should create messages and events invoking the most appropriate affective responses (Ashkanasy & Daus, 2005; Weiss & Cropanzano, 1996). For example, organizations interested in increasing task-related pro-environmental behavior could either make employees' pro-environmental attitudes salient (e.g., by presenting a pro-environmental message) or induce a more positive unactivated affective state (e.g., relaxed, calm). This could be done through job design and by facilitating positive work events (Basch & Fischer, 2000; Weiss & Cropanzano, 1996). An important caveat is to acknowledge that employees' affect is not exclusively related to the workplace and workplace events; there may be spill-over effects from events and experiences outside of work (Judge & Ilies, 2004).

Limitations and Future Research

This study has a number of limitations that must be acknowledged. First, all variables were assessed using self-report measures, rather than more objective observer reports (e.g., peer ratings of pro-environmental behavior) or physiological indicators of affect. However, self-report measures are well-suited for daily diary studies, for at least two reasons (Bolger et al., 2003; Ohly et al., 2010). First, the methodology requires short and practical measures that must be administered over several days—bringing participants into the lab to obtain physiological indicators of affect would be costly in terms of time and resources. Second, self-report measures provide accurate assessment of constructs over multiple days of data collection. With respect to affect, individuals are in the best position to report their own level of affect across each day of the study. Similarly, it can be argued that employees are also best suited to provide accurate reports of their pro-environmental behaviors over an entire working day for the duration of the study. Peer raters, including coworkers and

supervisors, may not be able to judge these behaviors accurately, because they may not have the opportunity to observe employees' behavior over long periods of time (Spector, 2006).

Second, the construct validity of our pro-environmental behavior measures may be questioned. Even though we adapted well-validated and widely-used work behavior scales and confirmatory factor analyses showed that both types of pro-environmental behavior are distinct, future research needs to explore the nomological net of task-related and proactive pro-environmental behaviors more thoroughly. For example, we do not know what *specific* types of pro-environmental work behaviors our scales assessed. In addition, one anonymous reviewer raised the interesting possibility that respondents may have interpreted the task-related items as not doing anything that may harm the environment rather than engaging in behaviors that may help the environment. Furthermore, there is also the possibility that certain pro-environmental behaviors (e.g., recycling) are formally required within organizations. Some respondents may have indicated the extent to which they complied with these requirements as opposed to the extent to which they engaged in completely discretionary pro-environmental behaviors.

Third, our sample was relatively small with only 56 participants from small businesses which resulted in 910 data points at the within-person level (i.e., across the daily surveys). However, these sample sizes are adequate to detect medium-sized effects with high statistical power (Scherbaum & Ferreter, 2009). In addition, our sample size is well within the range of sample sizes ranging from 46 to 65 reported in recent diary studies in the organizational literature (Beal & Ghandour, 2011; Foo et al., 2009; Judge, Scott, & Ilies, 2006). However, as our participants worked in only four different industry sectors (with the majority working in the services and retail trade industries), we cannot be sure whether our findings generalize to different industry sectors. It may be possible that employee characteristics such as pro-environmental attitude and daily affect have stronger effects on daily pro-environmental behaviors in industries such as service and retail that provide employees with higher levels of autonomy (e.g., to carry out their tasks in a certain way), compared to industries that offer employees less autonomy to carry out their tasks, such as manufacturing, construction, or agriculture. We do expect, however, that all jobs and organizations provide opportunities for employees to engage in pro-environmental behaviors. Thus, future research could examine the job and organizational context both as a direct predictor of pro-environmental behaviors as well as a moderator of affect-attitude-behavior relationships. Furthermore, the potential moderating role of the organizational pro-environmental climate on relationships between affect and pro-environmental behavior may also be investigated. Studies have found that the organizational pro-environmental climate positively relates to the pro-environmental behavior of members within the organization (e.g., Schelly, Cross, Franzen, Hall, & Reeve, 2011),

but so far no research on pro-environmental climate as a boundary condition for within-person relationships exists.

Finally, we cannot make definitive claims about causality in this study. This study served as a first step in investigating multi-level relationships between daily affect, pro-environmental attitude, and pro-environmental behavior. Future research may expand upon the current study to detect causal direction between these constructs. Causality may be better determined using a cross-lagged panel study design in which affect, attitudes, and pro-environmental behavior are each measured at multiple times (Kenny, 1975). In addition, such longitudinal studies could control for the possible confounding influences of personality characteristics and type of work on both affective experiences and pro-environmental behavior. For example, agreeableness and openness to experience may not only be related to pro-environmental behaviors (Hirsh, 2010; Hirsh & Dolderman, 2007), but also to the affective and work experiences of employees. Furthermore, certain work environments (e.g., service occupations) may provide employees with higher levels of autonomy, which in turn may promote both positive affective experiences and pro-environmental behaviors.

In conclusion, this research contributes to the organizational literature by investigating the interplay between two types of daily positive affect (unactivated and activated) and pro-environmental attitude in predicting daily pro-environmental behavior at work. We introduced the nuanced distinction between proactive and task-related pro-environmental behaviors, which is important as each is predicted by a distinct set of variables. Furthermore, the use of a daily diary design showed that pro-environmental behaviors fluctuated within individuals over time, and that this variation, in part, could be predicted by specific types of daily affect and pro-environmental attitude. Organizational practitioners may use the findings of this study to more successfully promote targeted pro-environmental employee behaviors, thus contributing to the ongoing development of “greener” organizations. Future research is now needed that further investigates the interplay between dynamic, day-level predictors and between-person predictors and moderators of workplace pro-environmental behavior.

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CHAPTER 4

GOOD MOODS AND GOOD DEEDS: A DAILY DIARY STUDY ON POSITIVE AFFECT AND PRO-ENVIRONMENTAL BEHAVIOR

Abstract

This study investigated the daily interplay between two types of positive affect, unactivated (e.g., feeling relaxed) and activated (e.g., feeling enthusiastic) positive affect, and two types of pro-environmental behavior, basic and proactive. We expected unactivated positive affect and pro-environmental social norms to be positively related to basic pro-environmental behavior, and activated positive affect to be positively related to proactive pro-environmental behavior. Moreover, we hypothesized that pro-environmental social norms would moderate the relationship between unactivated positive affect and basic pro-environmental behavior, such that this relationship would be stronger when pro-environmental social norms are less positive. To test our hypotheses, we employed a daily diary design: 94 university students reported their daily affect and behavior over 14 consecutive days. Results supported our hypotheses. Our findings suggest that transient affective experiences can be important predictors of pro-environmental behavior; notably, feeling energized may promote pro-environmental behaviors that are above and beyond what is expected.

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Good Moods and Good Deeds: A Daily Diary Study on Positive Affect and Pro-environmental Behavior

Feelings can play an instrumental role in shaping our actions (Dolan, 2002; Mauss et al., 2005). Positive affect such as feeling happy or relaxed, for example, has been shown to predict a variety of prosocial behaviors (Isen, 1999; Lyubomirsky et al., 2005), including time spent helping others (Lucas, 2001), donating money to charity (Cunningham et al., 1980), and giving blood (O'Malley & Andrews, 1983). Research also suggests that positive affect may relate to positive behavior directed at the environment (i.e., pro-environmental behavior) (Bissing-Olson et al., 2013; Gatersleben & Uzzell, 2007; Harth et al., 2013; Kals, Schumacher, & Montada, 1999; Koenig-Lewis et al., 2014; Mann & Abraham, 2006; Ojala, 2008; Onwezen et al., 2013; Passafaro et al., 2014). Despite a growing interest in the relationship between positive affect and pro-environmental behavior, most research has focused primarily on how affective experiences that are directly related to the environment (e.g., emotional affinity toward nature) are linked to pro-environmental behavior (e.g., Kaiser, 2006; Kals & Müller, 2012; Mallett, 2012; Mallett et al., 2013; Onwezen et al., 2013). In contrast, very little work has considered how everyday, or transient, positive affective experiences (e.g., being in a positive mood during the day) relate to daily engagement in pro-environmental behavior.

Research about the day-to-day relationships between affect and pro-environmental behavior is important because it provides evidence of relationships between affect and pro-environmental behavior as they occur naturally within the rich contexts of people's real-world activities (Bolger et al., 2003). This contrasts with previous research, which has mainly employed experimental designs in laboratory settings with data collection occurring at a single time-point. In such studies, participants are usually asked to think about their environmental behavior in a very general sense or are given explicit feedback about their environmental behavior. Such forms of reflection or input about environmental behavior rarely occur on a day-to-day basis and, therefore, past research tells us little about how affect may influence pro-environmental behavior in our everyday lives.

The present research contributes to the literature on affect and pro-environmental behavior by examining the daily interplay between positive affect and engagement in pro-environmental behavior by asking participants to report the behavior and affect they experienced during the day over a two week period. We also examine whether features of the social context—in particular perceived social norms—moderate the relationship between positive affect and pro-environmental behavior. We expect positive affect to be positively related to pro-environmental behavior, particularly in a context where pro-environmental social norms are more ambivalent and, hence, less prescriptive. We outline the logic for this prediction below.

Positive Affect and Pro-environmental Behavior

The focus of the current study is on positive incidental affect, or individuals' positive emotional experiences about any target they may encounter over the course of their day (Forgas, 1995; Loewenstein & Lerner, 2003). This includes a broad range of affective experiences (e.g., moods). We propose that, in general, positive incidental affect will be associated with pro-environmental behavior. We base this proposition on the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001), which states that the experience of positive affect has important implications for a range of positive behaviors. According to Fredrickson (1998, 2001), the experience of positive affect expands the scope of people's thought and action repertoires and builds their personal resources. This, in turn, leads to greater engagement in positive behaviors (Fredrickson, 2003), including pro-environmental behaviors. Support for this theory comes from research showing that positive affect leads to engagement in prosocial behavior (Lyubomirsky et al., 2005) and that incidental positive affect is positively related to pro-environmental behavior at work (Bissing-Olson et al., 2013).

We further differentiate positive affect by distinguishing between the activation/arousal level (i.e., unactivated/unaroused vs. activated/aroused) of positive emotional experiences (Larsen & Diener, 1992; Russell, 1980; Watson & Tellegen, 1985). *Unactivated positive affect* includes feelings at a low level of activation (e.g., contentment, being at rest, and relaxation), whereas *activated positive affect* includes feelings at a high level of activation (e.g., excitement, euphoria, and enthusiasm). Distinguishing between different levels of activation is important because, according to the emotion literature, different levels of activation may lead to specific types of action (Frijda, 1986; Frijda et al., 1989). Unactivated positive affect (e.g., contentment), for example, may trigger reflection and a tendency to see connections, whereas activated positive affective (e.g., feeling excited) may lead to approach behavior requiring more effort or energy, such as exploration (De Rivera et al., 1989; Izard, 1977).

We investigate how unactivated and activated positive affective experiences relate to two broad types of pro-environmental behavior, which are distinguished based on the level of effort and initiative required to carry each out. Some pro-environmental behaviors are carried out more easily and may be a matter of habit, such as recycling paper at a location where bins are available (Aarts & Dijksterhuis, 2000; Vining & Ebreo, 1992). We conceptualize these actions as *basic pro-environmental behavior*. In contrast, *proactive pro-environmental behaviors* require more effort and personal initiative, such as changing to more environmentally-friendly transportation options (Bissing-Olson et al., 2013; Norton et al., 2014). Proactive behavior involves self-starting action to produce a desired change in one's own and others' lives (Grant & Ashford, 2008; Parker et al., 2010). Opportunities and resources to make such changes may not be readily available, which

means that individuals would need to create or develop them. We conceptualize basic and proactive pro-environmental behaviors as distinct, but related, forms of pro-environmental behavior: Basic pro-environmental behavior is carried out within a person's established repertoire of action, whereas proactive pro-environmental behavior moves outside of one's familiar pattern of behavior and involves a more active and change-oriented approach to environmental behavior.

We propose that unactivated (e.g., contentment, being at rest, and relaxation), but not activated (e.g., excitement, euphoria, and enthusiasm), positive affect will be positively associated with basic pro-environmental behavior. As mentioned above, the emotion literature posits that different levels of activation in positive affect may lead to specific types of action (Frijda, 1986; Frijda et al., 1989). Unactivated positive affect (e.g., relaxation) may prompt approach-oriented, prosocial action, but only if such action does not require a great deal of energy or effort to achieve (De Rivera et al., 1989; Izard, 1977). Thus, individuals experiencing unactivated positive affect may not feel the need to make great changes to their pro-environmental behavior, rather, they are content to continue behaving as they have been. Our prediction also corresponds with the findings of Bissing-Olson et al. (2013), who found that only daily unactivated—and not activated—positive affect predicted task-related pro-environmental behavior at work. Task-related pro-environmental behavior is similar to our concept of basic pro-environmental behavior in that it describes behavior that is usual or habitual. Building on existing theory and research, we expect that people who experience unactivated positive affect should be more likely to engage in basic pro-environmental behavior (Hypothesis 1).

Drawing again from the broader emotion literature, activated positive affective (e.g., feeling excited) may lead to a different behavioral outcome than unactivated positive affect (Frijda, 1986; Frijda et al., 1989). For instance, a person experiencing activated positive affect (e.g., enthusiasm) may be more inclined and driven (activated) to make a more profound change in his/her pro-environmental behavior. Models of proactivity (Grant & Ashford, 2008; Parker et al., 2010) and motivation (Brehm, 1999; Seo et al., 2004) also support this reasoning. These models propose that a high level of activation is an important predictor of proactive behavior. Proactive behavior is driven by different motivating factors, such as feeling "energized to" take action (Grant & Ashford, 2008; Parker et al., 2010), that lead to increased effort toward a task or goal (Brehm, 1999; Seo et al., 2004; Seo et al., 2010). In the case of proactive pro-environmental behavior, feelings of high activation (e.g., feeling energetic and enthusiastic) could trigger individuals to invest effort in engaging in environmentally friendly behavior that requires high personal initiative such as setting up a new recycling bin or encouraging others to also act in environmentally-friendly ways. The study by Bissing-Olson et al. (2013) mentioned above also provides empirical support for this view: The authors found that daily activated positive affect was related to proactive pro-environmental

behavior at work when employees' pro-environmental attitude was less positive, and that activated positive affect was not related at all to task-related pro-environmental behavior. Thus, we expect that daily activated positive affect will be positively related to daily proactive pro-environmental behavior (Hypothesis 2).

The Role of Social Norms

In the current study, we also investigate whether the relationship between positive affect and pro-environmental behavior is moderated by aspects of the social context, in particular the perceived normative context. To our knowledge, past research has not examined whether the perceived normative context influences the relationship between affect and behavior. Past research has shown that pro-environmental social norms—the accepted or implied rules about how members of a group act and should act (Sherif, 1965; Turner, 1991)—have a direct and positive impact on pro-environmental behavior (Göckeritz et al., 2010; Goldstein et al., 2008; McDonald et al., 2014; Schultz, 1999). It is argued that social norms, which encompass descriptive norms (i.e., what people actually do) and injunctive norms (i.e., what people should do), influence behavior by providing people with guidelines on how to act (Ajzen, 1991; Cialdini et al., 1990).

We expect that pro-environmental social norms will moderate the relationship between daily unactivated positive affect and daily basic pro-environmental behavior, but not the relationship between daily activated positive affect and proactive pro-environmental behavior. The reasoning for this is that social norms relate to normal and expected behavior, such as basic pro-environmental behavior. In contrast, proactive pro-environmental behavior is a type of proactive behavior, which involves showing initiative above and beyond expectations and established norms (Frese et al., 1997). Thus, when people engage in proactive pro-environmental behavior, they are doing something unexpected or different from the implied behavioral standards established by pro-environmental social norms. Perceived social norms should therefore pertain more to basic pro-environmental behavior than proactive pro-environmental behavior and, thus, are unlikely to moderate the relationship between activated positive affect and proactive pro-environmental behavior. Regarding basic pro-environmental behavior, and in accordance with normative theory presented above (Ajzen, 1991; Cialdini et al., 1990), when people perceive stronger normative support for behavior, then these perceived norms should act like an over-riding guide for action. On the other hand, when individuals do not perceive strong normative support, other factors, such as in-the-moment affect or mood, may be more likely to guide their behavior. We hypothesize, therefore, that the relationship between daily unactivated positive affect and daily basic pro-environmental behavior will be more strongly positive for people who perceive less supportive pro-environmental social norms than for people who perceive more supportive pro-environmental social norms (Hypothesis 3).

Method

Research Design

We employed a daily diary design to examine our hypotheses (Bolger, Davis, & Rafaeli, 2003; Gunthert & Wenzel, 2012), whereby participants reported on their affect and behavior once a day over multiple days. This approach enabled us to examine how fluctuations in affect across days covary with fluctuations in behavior, and to investigate how social norms moderated these relationships. Moreover, daily diary designs enable an examination of these relationships as they occur spontaneously in naturally occurring contexts while reducing retrospective reporting biases (Bolger et al., 2003; Reis, 1994).

Pro-environmental attitude was included as a control variable as research has shown pro-environment attitude to positively predict pro-environmental behavior (Bamberg & Möser, 2007; Kaiser, Wölfing, & Fuhrer, 1999). We also controlled for daily unactivated and activated negative affect in order to demonstrate that unactivated and activated positive affect are associated with pro-environmental behavior independently of negative affect. Pro-environmental behaviors are positive and pro-social behaviors (Kollmuss & Agyeman, 2002; Steg & Vlek, 2009); therefore, we do not expect that activated or unactivated negative affect are related to daily basic or proactive pro-environmental behavior.

Participants and Procedure

Ninety-four Australian university students between 17 and 50 years of age ($M_{\text{age}} = 20.3$ years, $SD = 5.1$ years) participated for course credit. Seventy-eight participants were female (83.0%), 15 participants were male (16.0%), and one participant did not indicate their gender. The sample originally included 95 participants, but one participant did not complete any daily surveys and, therefore, could not be included in analyses.

At the beginning of the study period, participants completed a one-time baseline survey in paper-and-pencil format that measured pro-environmental social norms, pro-environmental attitude, and demographic characteristics. Starting on the following day, participants filled out one short online survey each day between 4 p.m. and midnight over a period of 14 consecutive days. The daily surveys assessed affective states experienced and pro-environmental behavior carried out during that day. The daily surveys and the baseline survey were anonymously linked via a code unique to each participant. Participants did not have access to previous responses. At the beginning of the 14-day period, the researcher offered to send participants reminders by email and/or text message to complete the daily survey. Eighty-nine participants opted to receive these daily reminders.

Measures

Pro-environmental social norms. Pro-environmental social norms—referring to friends’ and peers’ behavior and beliefs regarding the environment—were measured once in the baseline survey using a short four-item scale (adapted from Terry & Hogg, 1996; Terry, Hogg, & White, 1999). The four items reflect aspects of both injunctive and descriptive norms. The social norms referred to friends and peers because these groups are important norm-setters for young adults (Paterson, Field, & Pryor, 1994). Participants rated their level of agreement with each item on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The items are “My friends and peers care about the environment,” “My friends and peers act in environmentally-friendly ways,” “My friends and peers try to conserve resources,” and “My friends and peers feel that environmental issues are important.” Internal consistency was good ($\alpha = .85$).

Pro-environmental attitude. Pro-environmental attitude was measured once in the baseline survey using the New Ecological Paradigm (NEP) Scale (Dunlap & Van Liere, 1978; Dunlap et al., 2000). Example items are “The balance of nature is very delicate and easily upset” and “If things continue on their present course, we will soon experience a major ecological catastrophe.” Participants rated their level of agreement with each item on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Following recommendations by Dunlap et al. (2000), we computed a single pro-environmental attitude factor by averaging all 15 items (seven reverse scored) in the scale. Internal consistency was acceptable ($\alpha = .64$).

Daily affect. Daily affect was measured each day using four scales with four items each from the self-report circumplex instrument (Larsen & Diener, 1992). These items represent four types of affective experiences, which are organized along two dimensions: activation level (i.e., activated/high arousal or unactivated/low arousal) and hedonic valence (i.e., positive or negative). Participants were instructed to indicate the extent to which they felt each item during the day by using a 5-point scale from 1 (*very slightly or not at all*) to 5 (*extremely*). *Daily activated positive affect* was measured with the four items, “enthusiastic,” “elated,” “excited,” and “euphoric” (α at each time point ranged from .90 to .95). *Daily unactivated positive affect* was measured with the four items, “relaxed,” “content,” “at rest,” and “calm” (α ranged from .90 to .96). *Daily activated negative affect* was measured with the four items, “distressed,” “annoyed,” “fearful,” and “nervous” (α ranged from .81 to .92). *Daily unactivated negative affect* was measured with the four items, “dull,” “tired,” “drowsy,” and “sluggish” (α ranged from .84 to .93).

In order to test whether the 16 items used to assess daily affect represent four distinct dimensions, we conducted multilevel confirmatory factor analyses using Mplus (Muthén & Muthén, 2011). We compared the hypothesized four-factor model with a one-factor model that did not differentiate between different types of affect and a two-factor model that only differentiated

between positive affect and negative affect. The four-factor model had a satisfactory fit to the data ($\chi^2 = 640.851$, $df = 98$, $p < .001$, confirmatory fit index [CFI] = 0.91, root mean square error of approximation [$RMSEA$] = 0.07). The four-factor model fit the data significantly better than the one-factor model ($\chi^2 = 4564.92$, $df = 104$, $p < .001$, $CFI = 0.28$, $RMSEA = 0.19$; $\Delta\chi^2 = 3924.07$, $\Delta df = 6$, $p < .001$) and the two-factor model ($\chi^2 = 2791.22$, $df = 103$, $p < .001$, $CFI = 0.56$, $RMSEA = 0.15$; $\Delta\chi^2 = 3924.07$, $\Delta df = 6$, $p < .001$). Overall, these findings suggest that participants differentiated between the four types of daily affect.

Daily pro-environmental behavior. Two types of pro-environmental behavior, daily *basic* pro-environmental behavior and daily *proactive* pro-environmental behavior, were each measured every day using five items on a 5-point scale from 1 (*never*) to 5 (*always*). The items measuring daily basic pro-environmental behavior were adapted from Bissing-Olson et al. (2013). Examples are “Today, I carried out my everyday activities in environmentally-friendly ways” and “Today, I ensured that my actions were environmentally-friendly.” Items used to measure proactive pro-environmental behavior were derived from Frese, Fay, Hilburger, Leng, and Tag’s (1997) personal initiative scale. Example items assessing daily proactive pro-environmental behavior are “Today, I made environmentally-friendly changes to the way I live my life” and “Today, I took initiative to act in environmentally-friendly ways.” The scales had high internal reliability at each time point, ranging from $\alpha = .94$ to $\alpha = .97$ for the basic pro-environmental behavior scale and from $\alpha = .87$ to $\alpha = .96$ for the proactive pro-environmental behavior scale.

In order to test whether the ten items used to assess daily pro-environmental behavior represent two distinct constructs, we conducted multilevel confirmatory factor analyses using Mplus (Muthén & Muthén, 2011). We compared the hypothesized two-factor model with a one-factor model that did not differentiate between different types of pro-environmental behavior. The two-factor model had a satisfactory fit to the data ($\chi^2 = 323.79$, $df = 34$, $p < .001$, $CFI = 0.95$, $RMSEA = 0.09$). The two-factor model fit the data significantly better than the one-factor model ($\chi^2 = 2039.68$, $df = 35$, $p < .001$, $CFI = 0.63$, $RMSEA = 0.22$; $\Delta\chi^2 = 1715.89$, $\Delta df = 1$, $p < .001$), suggesting that participants distinguished between the two constructs.

Results

Overview of Analyses

Data were analyzed using random coefficient modeling with the hierarchical linear modeling software (HLM; Raudenbush & Bryk, 2002; Raudenbush et al., 2004) in order to account for the multilevel structure of the data. That is, days (i.e., within-person level) were nested within persons (i.e., between-person level). Consistent with established standards in the literature, the between-person level variables, pro-environmental social norms and pro-environmental attitude, were centered at the grand (or sample) mean and all within-person level predictor variables—the

four types of daily affect—were centered at each person’s mean (Hofmann et al., 2000). Centering at each person’s mean removes all between-person variance in the within-person level variables; therefore, the results of the HLM analyses for the within-person variables as predictors cannot be attributed to between-person differences. We included all four types of daily affect simultaneously as predictors in the model. This allowed us to distinguish between the unique effects of each predictor on the outcomes: daily basic pro-environmental behavior and daily proactive pro-environmental behavior.

Preliminary Analyses

On average, participants completed 12.21 ($SD = 2.37$) out of the possible 14 daily surveys (range = 4 to 14), resulting in data from a total of 1,148 daily surveys (94 participants \times 12.21 days; response rate of 87.23%). Table 1 presents descriptive statistics, within- and between-person variance components, the ratio of between-person variance to total variance for each measure or intraclass correlation coefficient (ICC), reliability scores, and bivariate correlations for all variables. As shown in Table 1, the mean rating for daily proactive pro-environmental behavior indicated that on average participants reported “*never*” or “*rarely*” engaging in proactive pro-environmental behavior each day ($M = 1.66$, $SD = 0.79$). This is consistent with the conceptualization of proactive pro-environmental behavior (see Bissing-Olson et al., 2013), and proactive behavior in general (Frese et al., 1996). That is, this type of behavior requires initiative to evoke a change in behavior, which can be expected to occur relatively infrequently. Daily basic pro-environmental behavior was reported as occurring more frequently (i.e., between “*rarely*” and “*sometimes*”; $M = 2.85$, $SD = 0.91$). This is also consistent with the conceptualization of this type of behavior as requiring less effort and as being somewhat habitual (Aarts & Dijksterhuis, 2000).

Table 1

Descriptive Statistics and Correlations of the Study Variables

Variable	<i>M</i>	<i>SD</i>	α	τ_{00}	σ^2	ICC	1	2	3	4	5	6	7
<i>Within-person (daily) variables</i>													
1. Daily activated positive affect	1.95	0.98	.90	0.40	0.56	.42	—						
2. Daily unactivated positive affect	2.62	1.06	.92	0.47	0.66	.42	.56**	—					
3. Daily activated negative affect	1.80	0.98	.82	0.40	0.57	.41	.23*	-.05	—				
4. Daily unactivated negative affect	2.41	1.08	.84	0.34	0.83	.29	.10	.08	.56**	—			
5. Daily basic pro-environmental behavior	2.85	0.91	.94	0.56	0.29	.66	.08	.02	.08	-.09	—		
6. Daily proactive pro-environmental behavior	1.66	0.79	.88	0.36	0.26	.58	.53**	.24*	.40**	.23*	.40**	—	
<i>Between-person variables</i>													
7. Pro-environmental social norms	3.28	0.68	.85	—	—	—	.06	-.12	.05	-.17	.31**	.15	—
8. Pro-environmental attitude	3.65	0.36	.64	—	—	—	-.00	-.18	.08	.19	.13	.08	.09

Note. $N = 94$. The reliability for the within-person variables is Cronbach's alpha, calculated using the data from the first day of data collection. The intraclass correlation coefficient (ICC) is calculated by dividing the between-person variance component (τ_{00}) of the null model (i.e., the model with no predictors at either the within- or between-person level) by the sum of τ_{00} and the within-person variance component (σ^2) of the null model. The result is the percentage of the variance in the daily measure due to between-person differences (Bolger & Laurenceau, 2013). The means, standard deviations, and bivariate correlations of the within-person study variables were calculated after aggregating each participant's data across all data collection time points. *SD* = standard deviation. α = Cronbach's alpha.

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

On average, participants reported feeling unactivated positive affect ($M = 2.62$, $SD = 1.06$) and unactivated negative affect ($M = 2.41$, $SD = 1.08$) more frequently than activated positive affect ($M = 1.95$, $SD = 0.98$) and activated negative ($M = 1.80$, $SD = 0.98$). Pro-environmental social norms ($M = 3.28$, $SD = .68$) and pro-environmental attitude ($M = 3.65$, $SD = 0.36$) had means close to or somewhat above the mid-point of the scale. Finally, Table 1 shows that the ICCs of the within-person study variables ranged from .29 (daily unactivated negative affect) to .66 (daily basic pro-environmental behavior), indicating that between 29% and 66% of the variance in those variables was due to interindividual differences (e.g., pro-environmental attitude) and the remaining variance was due to intraindividual or daily factors as well as error variance.

All measures were collected through self-report questionnaires, which means that common method bias may artificially inflate the correlations between constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To investigate the magnitude of this potential bias in our study, we first examined the factor structure of the daily self-reported scale items (four affect scales, basic and proactive pro-environmental behavior) by conducting multilevel confirmatory factor analyses using Mplus (Muthén & Muthén, 2011). In contrast to a one-factor model ($\chi^2 = 12,766.30$, $df = 299$, $p < .001$, $CFI = 0.10$, $RMSEA = 0.19$), the six-factor model had an adequate fit ($\chi^2 = 1,309.80$, $df = 284$, $p < .001$, $CFI = 0.93$, $RMSEA = 0.06$). This suggests that the six self-report scales were statistically distinct. Second, we compared the six-factor model with a seven-factor model that included a method factor (Podsakoff et al., 2003). This method factor takes into account the effects of an unmeasured latent methods factor. In this model, the items of the six self-report scales had equal factor loadings on the method factor. The seven-factor model did not substantially improve the fit beyond the six-factor model ($\chi^2 = 1,242.49$, $df = 277$, $p < .001$, $CFI = 0.93$, $RMSEA = 0.06$), suggesting that common method bias is unlikely to have influenced the study results.

Tests of Hypotheses

Table 2 presents the HLM results of two models for each outcome variable. Model 1 includes only the direct effects of the predictor variables. Model 2 adds the interaction effects between pro-environmental social norms and daily affective states. Figure 1 presents the main results in graphic form.

Table 2

HLM Results for Models Predicting Daily Basic and Proactive Pro-environmental Behavior

Predictor	DV: Daily Basic						DV: Daily Proactive					
	Pro-environmental Behavior						Pro-environmental Behavior					
	Model 1			Model 2			Model 1			Model 2		
	γ	SE_{γ}	p	γ	SE_{γ}	p	γ	SE_{γ}	p	γ	SE_{γ}	p
Intercept	2.86	.08	<.001	2.86	.08	<.001	1.66	.06	<.001	1.66	.06	<.001
<i>Within-person variables</i>												
Daily activated positive affect (DAPA)	.05	.03	.128	.05	.03	.126	.07	.03	.025*	.07	.03	.029*
Daily unactivated positive affect (DUPA)	.05	.03	.035*	.05	.03	.049*	-.00	.02	.973	-.00	.02	.913
Daily activated negative affect (DANA)	.02	.03	.498	.02	.03	.480	.03	.03	.362	.03	.03	.401
Daily unactivated negative affect (DUNA)	.01	.02	.520	.01	.02	.532	.02	.02	.345	.02	.02	.363
<i>Between-person variables</i>												
Pro-environmental social norms	.30	.11	.008**	.29	.11	.011*	.14	.09	.124	.11	.09	.248
Pro-environmental attitude	.32	.21	.127	.32	.21	.125	.19	.17	.265	.20	.17	.240
<i>Cross-level moderation</i>												
DAPA × Pro-environmental social norms				-.01	.04	.901				-.05	.04	.244
DUPA × Pro-environmental social norms				-.08	.04	.033*				-.04	.03	.119
DANA × Pro-environmental social norms				-.02	.05	.784				-.03	.04	.538
DUNA × Pro-environmental social norms				-.02	.03	.644				-.02	.03	.616

Note. HLM = hierarchical linear modeling; γ = unstandardized coefficient; SE_{γ} = standard error of γ .

* = $p < .05$, ** = $p < .01$, † = p -value approaching significance.

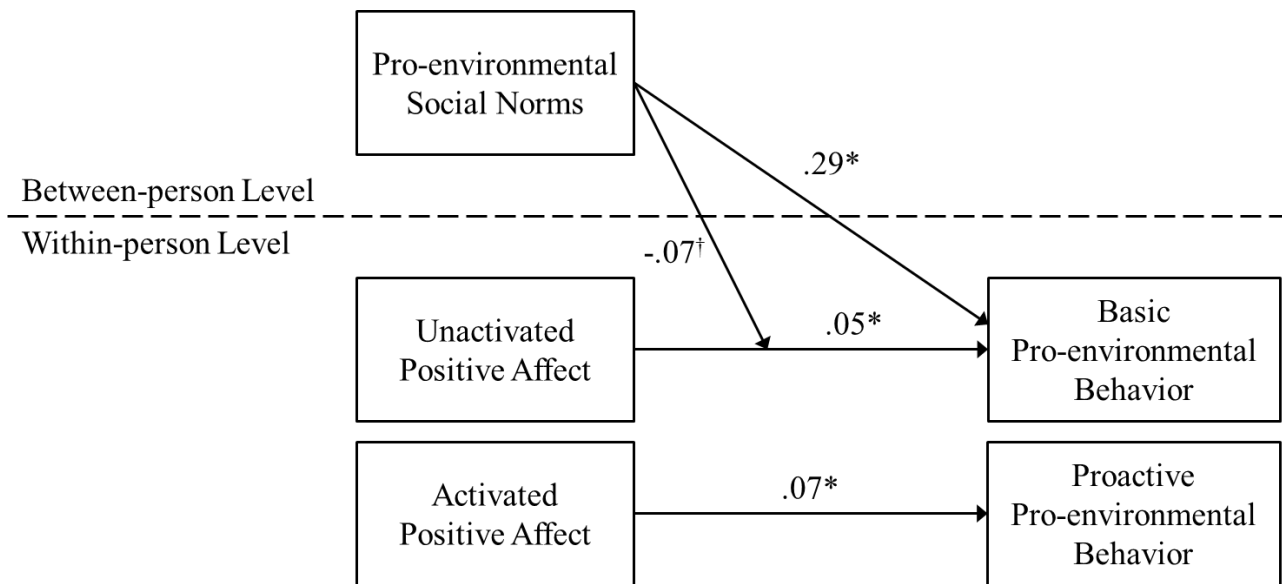


Figure 1. Graphic depiction of main results of HLM analyses.

Results show that daily unactivated positive affect was positively and significantly related to daily basic pro-environmental behavior ($\gamma = 0.05$, $p = .049$), supporting Hypothesis 1. As expected, daily activated positive affect, daily activated negative affect, and daily unactivated negative affect were not related to daily basic pro-environmental behavior. In support of Hypothesis 2, daily activated positive affect was positively related to proactive pro-environmental behavior ($\gamma = 0.07$, $p = .029$). The other daily affective states were not related to proactive pro-environmental behavior.

Hypothesis 3 proposed a moderation effect of pro-environmental social norms on the relationship between daily unactivated positive affect and basic pro-environmental behavior. Table 2 shows that this interaction effect was present in our data ($\gamma = -0.08$, $p = .033$). To further inspect this interaction effect, we utilized simple slope analysis for cross-level interactions (Preacher et al., 2006). This analysis regresses daily basic pro-environmental behavior on daily unactivated positive affect at more positive (i.e., one standard deviation above the mean) and less positive (i.e., one standard deviation below the mean) values of pro-environmental social norms (see Figure 2). Results revealed that the simple slope for participants who perceived less positive pro-environmental social norms was positive and significant ($B = .11$, $SE = 0.03$, $t = 3.03$, $p = .003$), whereas the simple slope for people who perceived more positive pro-environmental social norms was close to zero and non-significant ($B = -.00$, $SE = 0.04$, $t = -0.08$, $p = .936$). Together, these findings support Hypothesis 3.

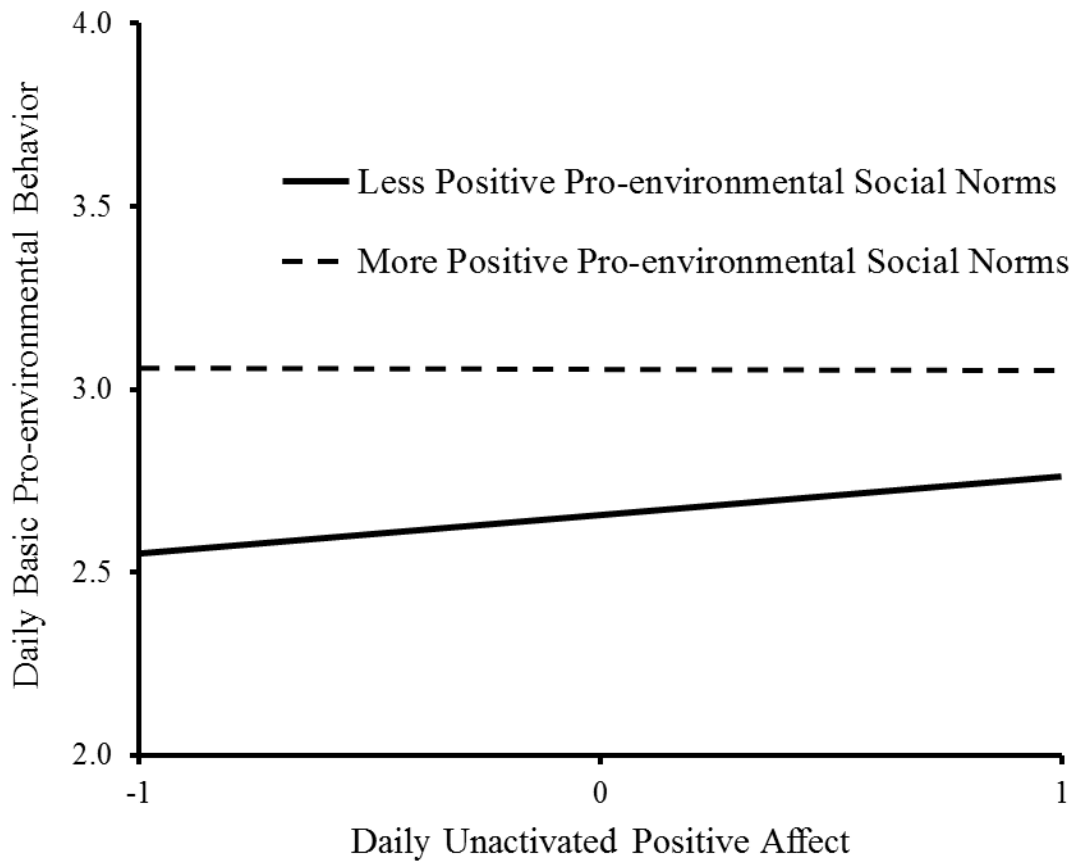


Figure 2. Graph of the interactive effect of pro-environmental social norms on the relationship between daily unactivated positive affect and daily basic pro-environmental behavior.

Consistent with expectations, pro-environmental social norms were directly related to basic pro-environmental behavior ($\gamma = 0.29, p = .011$) and not related to proactive pro-environmental behavior ($\gamma = 0.11, p = .248$). Contrary to past research linking pro-environmental attitudes and pro-environmental behavior (Bamberg & Möser, 2007; Kaiser et al., 1999), the control variable, pro-environmental attitude, did not have significant direct effects on either daily basic pro-environmental behavior ($\gamma = 0.32, p = .127$) or daily proactive pro-environmental behavior ($\gamma = 0.20, p = .240$). One explanation for this result is that the high standard errors ($SE = 0.21$ and $SE = 0.17$, respectively) reduced our power to find an effect (Field, 2013). Another explanation is that the general measure of pro-environmental attitudes does not have a sufficiently high level of correspondence with the measures of specific day-to-day pro-environmental behaviors (for a full discussion, see Ajzen & Fishbein, 1977).

Discussion

The main goal of this study was to examine the relationship between incidental (activated and unactivated) positive affect experienced throughout the day and daily basic and proactive pro-environmental behaviors. This study also investigated whether pro-environmental social norms would moderate the relationship between daily positive affect—specifically unactivated positive

affect (e.g., feeling relaxed and at rest)—and daily basic pro-environmental behavior. Consistent with our prediction, unactivated positive affect was positively related to daily basic pro-environmental behavior (Hypothesis 1). That is, the more people reported feeling calm, relaxed, and content during the day, the more they reported acting in standard environmentally-friendly ways. This finding aligns with the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001), which states that positive affect builds personal resources and encourages prosocial behavior. In addition, this finding extends upon previous research that found similar findings in the workplace (Bissing-Olson et al., 2013) by showing that this relationship also occurs in broader everyday contexts.

Our prediction that daily activated positive affect would be positively related to daily proactive pro-environmental behavior was also supported (Hypothesis 2). That is, the more people reported feeling excited and enthusiastic, the more likely they were to report engaging in proactive pro-environmental behavior. This finding also concurs with the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001) as well as with models of proactivity (Grant & Ashford, 2008; Parker et al., 2010) and motivation (Brehm, 1999; Seo et al., 2004). That is, activated positive affect not only builds personal resources and facilitates helping behavior (Fredrickson, 1998, 2001), but also provides a feeling of being “energized to” take action (Parker et al., 2010), which results in increased effort toward a task or goal (Brehm, 1999; Seo et al., 2004; Seo et al., 2010).

Together, the above findings suggest that future research should consider incidental and/or transient affective experiences as important antecedents of pro-environmental behavior. Previous research on affect and pro-environmental behavior has focused on how general affective experiences that are directly linked to the environment (e.g., feeling hopeful about environmental problems; Ojala, 2008) relate to pro-environmental behavior (e.g., Kaiser, 2006; Kals & Müller, 2012; Mallett, 2012; Mallett et al., 2013; Onwezen et al., 2013). These types of affective experience resemble the affective component of individuals’ general pro-environmental attitudes (Petty et al., 2003). In contrast, the present study showed that incidental affective experiences (i.e., those not associated with environmental issues) were related to engagement in pro-environmental behavior. This is consistent with the one other study that has examined the relationship between daily affect and pro-environmental behavior (Bissing-Olson et al., 2013). The current study goes beyond the past study by demonstrating a relationship between daily affect and pro-environmental behavior outside of the workplace. The findings of the current study are also consistent with research showing a relationship of daily affect with other behaviors (e.g., performance and creativity at work; Brief & Weiss, 2002). More broadly, the current study results demonstrated that approximately one third of the total variance in daily basic and proactive pro-environmental

behaviors resided at the within-person level, and thus could be explained by within-person predictor variables, including but not limited to daily affect. Future research could investigate additional within-person predictors of pro-environmental behaviors such as day-to-day contact with others or daily events.

The current study also highlights a potential caveat to the relationship between daily affect and pro-environment behavior. Less supportive pro-environmental social norms moderated the relationship of unactivated positive affect with basic pro-environmental behavior: Consistent with Hypothesis 3, unactivated positive affect was positively related to daily basic pro-environmental behavior when people perceived less supportive compared to more supportive pro-environmental social norms. Thus, people who did not perceive supportive pro-environmental norms amongst their friends and peers were more likely to report engaging in basic pro-environmental behavior when they were feeling unactivated positive emotions, such as feeling calm and content. Consistent with normative theory (Ajzen, 1991; Cialdini et al., 1990), this finding suggests that norms can act as a guide for action. In particular, people who perceive more supportive social norms should be more likely to be guided by these norms whereas people who perceive less supportive social norms are more likely to be guided by other factors, such as in-the-moment affective experiences. This specifically applies to basic pro-environmental behaviors, which represent normal and expected behavior. As anticipated, pro-environmental social norms were not significantly related to daily proactive pro-environmental behavior; we reason that this is because proactive behavior requires people to go above and beyond social expectations (e.g., Frese et al., 1997).

The finding that daily unactivated positive affect interacted with pro-environmental social norms in predicting daily basic pro-environmental behavior suggests that multilevel models of antecedents of pro-environmental behavior may be useful, and specifically highlights the need for more research on norm–affect interactions in predicting pro-environmental behavior. Future research in this area could focus on norms other than those of the peer group or may examine whether affect helps people to overcome the demotivating effect of perceiving conflicting norms amongst their different referent groups (McDonald, Fielding, & Louis, 2013; McDonald et al., 2014). It is also possible that interactions between social norms and moral emotions (e.g., guilt and pride) may be stronger than interactions involving less morally-laden emotions (e.g., general positive affect), because social norms entail moral expectations (Hechter & Opp, 2001).

Taken together, our findings have important practical applications. Appealing to affective aspects of engaging in pro-environmental behavior has been recognized as a potentially important motivational force in encouraging pro-environmental behavior (Steg & Vlek, 2009). Our findings support this notion and suggest that, if environmental campaigns or green office programs want to encourage people to innovate or be proactive in their pro-environmental behavior, then it may be

more effective to seek to energize and animate people about environmental issues rather than to lead them to feel gloomy or complacent.

Limitations

This study has some limitations regarding design that should be addressed in future research. First, all of our variables were assessed using self-report measures, rather than more objective observer reports (e.g., peer ratings of pro-environmental behavior) or physiological indicators (e.g., of affect). Also, these self-report measures were in the form of statements about pro-environmental behavior in general as opposed to statements about one specific or multiple specific behaviors. Regarding the use of self-report measures, scholars have argued that self-report survey measures are well suited for daily diary studies for at least two reasons (Bolger et al., 2003; Gunthert & Wenzel, 2012). First, these studies necessitate short and practical measures that can be administered to participants over several days or weeks. Second, participants are in the best position to report on their daily affect and pro-environmental behavior on a daily basis (Watson, Clark, & Tellegen, 1988); reports of others such as friends or family members are likely to be deficient, because they do not have the opportunity to observe people's behavior every day across longer periods of time.

Second, we employed general measures of pro-environmental behavior in order to encompass the full range of environmental behaviors that can be carried out during the day. An alternative approach would have been to focus on specific types of behaviors such as energy consumption which may have provided more insight into the types of behaviors participants were reporting on. The issue of behavior measurement provides fertile ground for future research: While the current study examined the relationship between positive affect and pro-environmental behavior using a broad scope, future research could examine the associations between affect and specific pro-environmental behaviors using a more finely tuned study design, for instance, that allows for the investigation of such relationships within shorter time periods and/or in more specific settings (e.g., mornings or evenings in the household, relating to specific types of behavior).

A third limitation concerns our study sample, particularly the gender imbalance. Gender differences have been shown in self-reported global judgments of specific emotions (Brody & Hall, 2008); for example, women tend to report more positive emotions than men in reference to intimate interpersonal relationships and less positive affect when interpersonal relationships are not the focus (Simon & Nath, 2004). Research employing daily diary study designs, however, have indicated no gender differences in momentary assessments of behavior (Feldman Barrett, Robin, Pietromonaco, & Eysell, 1998). Other research has shown that a reduction in retrospection for reporting affective experiences reduces gender-stereotypic reporting patterns (Robinson, Johnson, & Shields, 1998). Thus, we believe the current study provided accurate evidence of the relationships between daily

affect and pro-environmental behavior. Nevertheless, future research should aim to involve a balance of male and female participants.

A final limitation to be considered involves the direction of causality. Although our hypotheses reflect a neutrality about the topic of causality, our theoretical reasoning originates from the proposition that positive affect is the driving force for behavior, as stated in the Broaden-and-Build Theory of Positive Emotions (Fredrickson, 2001). The present study is one of the first to investigate multilevel relationships between daily affect, pro-environmental social norms, and pro-environmental behavior. Thus, the present study acts as a first step for future investigations. Future research may use a combination of experimental and daily diary study designs to further probe the causal direction of relationships between these constructs.

Conclusion

The findings of our daily diary study contribute to the environmental psychology literature by examining how daily positive affect interacts with pro-environmental social norms in predicting daily pro-environmental behavior. Specifically, daily unactivated positive affect (e.g., feeling content) positively predicted daily basic pro-environmental behavior and daily activated positive affect (e.g., feeling enthusiastic) positively predicted daily proactive pro-environmental behavior. Pro-environmental social norms moderated the relationship between unactivated positive affect and basic pro-environmental behavior. Our findings highlight the need for more multilevel research that takes daily affective experiences into account. Our findings also provide evidence that, for pro-environmental behaviors that require going above and beyond, it is feeling energized that provides the motivating force to do more than what is expected.

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CHAPTER 5

EXPERIENCES OF PRIDE, NOT GUILT, PREDICT PRO-ENVIRONMENTAL BEHAVIOR WHEN PRO-ENVIRONMENTAL DESCRIPTIVE NORMS ARE MORE POSITIVE

Abstract

Emotions can greatly influence behavior, yet research on links between emotions and pro-environmental behavior—especially on how incidental emotion relates to pro-environmental behavior—is limited. The emotions of pride and guilt are important predictors of moral and prosocial behavior, and may therefore be particularly important for encouraging pro-environmental behavior. The present study uses an experience sampling study to examine how pride and guilt are related to daily engagement in pro-environmental behavior. Ninety-six university students recorded their engagement in specific pro-environmental behaviors, and their feelings of pride and guilt about these behaviors, at four time points each day for three consecutive days. Results of hierarchical linear modeling analyses showed that engagement in pro-environmental behavior during a 2.5-hour time period was positively related to pride, and negatively related to guilt, felt during that same time period. Pride about environmental behavior was positively related to subsequent engagement in pro-environmental behavior (i.e., pro-environmental behavior measured during the following 2.5-hour time period), but only for people who perceived more positive pro-environmental descriptive norms. Guilt was not related to subsequent engagement in pro-environmental behavior. We discuss implications for further research on the complex associations between daily experiences of moral emotions and pro-environmental behavior.

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Experiences of Pride, Not Guilt, Predict Pro-environmental Behavior When Pro-environmental Descriptive Norms Are More Positive

One of the most important challenges for psychologists is to understand which factors encourage greater engagement in behaviors that protect the environment and reduce our environmental impact (Gifford, 2014; Stern, 2000). Although emotions were identified as a potentially important influence on environmental behavior as far back as three decades ago (Vining, 1987, 1992), most empirical work has only recently started to investigate the role of emotions in shaping individuals' decisions to act in environmentally friendly ways (Bissing-Olson, Iyer, Fielding, & Zacher, 2013; Ferguson & Branscombe, 2010; Halpenny, 2010; Harth, Leach, & Kessler, 2013; Koenig-Lewis, Palmer, Dermody, & Urbye, 2014; Onwezen, Antonides, & Bartels, 2013; Passafaro et al., 2014; Rees, Klug, & Bamberg, 2015; Smith, Haugtvedt, & Petty, 1994; Wester et al., 2015). Studies have shown that both positive and negative emotions influence engagement in pro-environmental behavior. For example, people's negative anticipated emotions (e.g., feeling angry or frustrated) have been shown to reduce their desire to use public transportation and to engage in household recycling (Carrus, Passafaro, & Bonnes, 2008). In addition, positive emotions (e.g., feeling happy or optimistic) have been found to be an important predictor of green product purchases (Koenig-Lewis et al., 2014).

The specific emotions of pride and guilt—the focus of the current study—are important emotions to study in relation to pro-environmental behavior because they have been shown to guide moral and pro-social behavior more generally (Tangney, Stuewig, & Mashek, 2007; Tracy & Robins, 2007b). This recognition has led to a call for further research investigating the link between pride and guilt and pro-environmental outcomes (Bamberg & Möser, 2007). However, past research has not addressed the extent to which people experience guilt and pride about environmental behavior in their everyday lives, or the extent to which each emotion independently predicts subsequent environmental behavior. These questions are critical because an individual's day-to-day decisions and actions add up to create their environmental footprint. Understanding the role of emotions such as guilt and pride in shaping everyday behavior would substantially contribute to scholarly knowledge regarding the predictors of environmental behavior.

In the current study, we examine the dynamic interplay between everyday emotions (i.e., the transitory emotions we feel about our behavior as we go about our day) and pro-environmental behavior over time. We draw on functionalist theories of emotion to examine three key questions: 1) Does environmental behavior elicit feelings of pride and guilt during a typical day? 2) Do feelings of pride and guilt lead to environmental behavior during a typical day? 3) Is the relationship between emotion and subsequent pro-environmental behavior influenced by features of the perceived social context, such as perceived social norms? We use an experience sampling study

design to help us answer these basic questions, which, to our knowledge have not been addressed previously.

Pride, Guilt, and Pro-environmental Behavior

We expect that pro-environmental behavior will be associated with experiences of pride and guilt that, in turn, will influence subsequent behavior. According to appraisal theory, distinct appraisals (i.e., interpretations or evaluations) of situations and events induce specific emotions (Roseman & Smith, 2001). Individuals' experiences of self-conscious emotions, such as pride and guilt, are broadly based on their appraisals of their own behavior; assessments of such behavior are developed based on personally important standards of right and wrong (Tangney et al., 2007; Tracy & Robins, 2007b). If people believe that something they have done is moral and valued, they are likely to feel proud of this behavior. In contrast, if people believe that their behavior is immoral and inappropriate, they are likely to feel guilty about this behavior. Following from this premise, engagement in pro-environmental behavior—a positive and socially-desired behavior (Gifford, 2014)—should result in feelings of pride, whereas lack of engagement when opportunities arise should result in feelings of guilt.

Previous research supports this reasoning. For example, it has been shown that when individuals are told that their own carbon footprint is larger than average, they feel personal guilt about their environmental impact (Mallett, Melchiori, & Strickroth, 2013). This also applies to collective feelings of pride and guilt (i.e., feelings about an in-group's behavior): Being confronted with an in-group's (e.g., national) larger-than-average carbon footprint (Mallett et al., 2013) or humanity's impact on climate change (Rees et al., 2015) have been shown to lead to feelings of collective guilt, and reading about one's country's responsibility for environmental damage or protection has been shown to induce feelings of collective guilt or pride, respectively (Harth et al., 2013).

The current study differs from past research in addressing the question of whether environmental behavior leads to feelings of pride and guilt, by focusing on individual engagement in specific environmental behaviors carried out during their everyday activities, and how these relate to personal feelings of guilt and pride felt about environmental behavior during that same time period. That is, the current study allows us to draw conclusions about whether, during a typical day, environmental behavior actually leads to feelings of pride and guilt (Research Question 1). Drawing on appraisal theory we develop the following hypotheses: Engagement in pro-environmental behavior will be positively related to pride (Hypothesis 1) and negatively related to guilt (Hypothesis 2) about environmental behavior.

We further expect that pride felt about environmental behavior should positively influence subsequent engagement in pro-environmental behavior. According to the broaden-and-build theory

of positive emotions (Fredrickson, 2001; Fredrickson, & Branigan, 2005), positive emotions, such as pride, expand people's thought patterns to allow consideration of new and alternative behaviors, as well as new ways of thinking. The emotion of pride, which arises from personal achievements, should therefore motivate further achievement (Fredrickson, 2001; Tracy & Robins, 2007a).

Research on prosocial behaviors suggests that there is a reciprocal relationship between behavior and pride, with pride about the prosocial behavior reinforcing that behavior (Hart & Matsuba, 2007; Weiner, 1985). We know of only one study that has previously investigated this issue and it showed that pride about in-group pro-environmental behavior predicted a desire to donate money for environmental protection (Harth et al., 2013). The current study contributes to this line of research by focusing on feelings of pride as they relate to people's own personal behavior as opposed to collective in-group behavior and how these feelings of pride relate to subsequent actual (i.e., self-reported) pro-environmental behaviors. That is, the current study allows us to address the second research question that asks whether during a typical day, people's feeling of pride and guilt leads to environmental behavior. Based on the theoretical rationale outlined above and previous research: We predict that pride about previous environmental behavior will lead to engagement in subsequent pro-environmental behavior (Hypothesis 3).

Finally, also addressing Research Question 2, we expect that guilt about environmental behavior may be positively related to subsequent engagement in pro-environmental behavior. Guilt arises following a negative evaluation of a specific behavior that is based on personally important moral standards (Tangney & Dearing, 2002). According to functionalist theories of emotion, guilt leads to reparative action and increased future effort (Barrett, 1995; Tangney & Dearing, 2002). That is, guilt should motivate a desire to atone for prior wrong-doing. Previous empirical research has shown that collective guilt about past negative environmental behavior predicts willingness to conserve energy and pay green taxes (Ferguson & Branscombe, 2010) as well as a desire to repair environmental damage caused by one's in-group (Harth et al., 2013). It has also been shown that collective guilt predicts personal pro-environmental behavior intentions as well as public expression of environmentally friendly attitudes (Mallett, 2012). What past research has not investigated is whether guilt about failing to engage in pro-environmental behavior spurs future pro-environmental behavior as opposed to intentions or attitudes.

Based on theory and past findings: We expect that guilt about previous environmental behavior will positively predict subsequent engagement in pro-environmental behavior (Hypothesis 4). That is, when people have not engaged in as much pro-environmental behavior as they could have, their subsequent feelings of guilt will increase their motivation to make up for this lack of behavior and, thus, they will engage in more pro-environmental behavior. We do not expect that pride or guilt about other targets will be related to pro-environmental behavior. We base this

expectation on theorizing about construct specificity: The more specific the emotion, the better it should predict a specific behavior (Fishbein & Ajzen, 1975).

The Role of Perceived Social Norms

The current study seeks to answer a third and final Research Question: Do social norms influence the relationship between pride and guilt and subsequent pro-environmental behavior? Social norms are rules or standards for behavior among members of a group (Sherif, 1965; Turner, 1991) and they can be categorized in two main ways: as injunctive norms (i.e., perceptions of what people ought to do) and descriptive norms (i.e., what people actually do). We focus on descriptive norms in particular in this study, as they have been shown in previous research to predict a variety of pro-environmental behaviors, such as reduced littering (Cialdini, Reno, & Kallgren, 1990), increased recycling (Fornara, Carrus, Passafaro, & Bonnes, 2011; Nigbur, Lyons, & Uzzell, 2010; Schultz, 1999), use of public transport or bicycles rather than personal cars (Kormos, Gifford, & Brown, 2015), and energy conservation (Göckeritz et al., 2010; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008). We acknowledge that injunctive norms may also influence the relationships between pride and guilt and subsequent behavior, but recent environmental research has particularly focused on the role of environmental descriptive norms—for example, in behavior change interventions—and we therefore believe that the current study can make the most significant contribution to the literature by investigating the interaction between these types of norms and incidental emotions.

We expect that descriptive norms moderate the relationships between pride and guilt and subsequent engagement in pro-environmental behavior. According to Cialdini et al. (1990), descriptive norms reflect ideas about what is good or effective behavior. Generally, social norms can have a powerful impact on the development and expression of moral emotions because these stem from a sense of what is accepted in society (i.e., descriptive norms; Tangney & Dearing, 2002). According to functionalist theories, the feelings of pride and guilt arising from this sense of what is good or effective behavior can, in turn, motivate approach-oriented or prosocial behavior (Tangney & Dearing, 2002; Tracy, Robins, & Tangney, 2007).

Following from this, we propose that the motivation to engage in pro-environmental behavior should be heightened when people perceive more positive pro-environmental descriptive norms compared to when people perceive less positive pro-environmental descriptive norms. If this is the case, then pride about prior good environmental behavior or guilt about prior poor environmental behavior will be more strongly associated with subsequent pro-environmental behavior because pro-environmental descriptive norms will motivate people to want to conform to the norms. Thus, we hypothesize that: Pro-environmental descriptive norms will moderate the relationship between pride and guilt about environmental behavior and subsequent pro-

environmental behavior, such that the relationship for pride will be stronger for people who perceive more positive pro-environmental descriptive norms (Hypothesis 5) and the relationship for guilt will also be stronger when people perceive more positively pro-environmental descriptive norms (Hypothesis 6).

The Current Study

In summary, the current study addresses the following research questions: During a typical day, does environmental behavior lead to feelings of pride and guilt? (Research Question 1); During a typical day, do feelings of pride and guilt lead to environmental behavior? (Research Question 2); and Do perceived social norms influence the relationship between pride and guilt and subsequent pro-environmental behavior? (Research Question 3). We provide hypotheses for these research questions above, but acknowledge that, as previous research has not examined the relationship between pride and guilt and pro-environmental behavior as they play out in a daily context, these hypotheses are tentative. We tested our hypotheses using an experience sampling design in which participants completed a short survey on a portable electronic device multiple times a day for three days. This allowed us to examine the extent to which pride and guilt and engagement in pro-environmental behavior related to each other over the course of the day. This experience sampling approach has previously been used to shed light on the frequency and correlates of pride and guilt in everyday life, although not how they relate to pro-environmental behavior (Baumeister, Reis, & Delespaul, 1995; Nakamura, 2013).

Perceived pro-environmental descriptive norms (the proposed moderator) and pro-environmental attitude were assessed in a one-time general survey at the beginning of the study period. Pro-environmental attitude was included as a control variable in the prediction of pro-environmental behavior because it has been shown to be an important predictor of pro-environmental behavior (Bamberg & Möser, 2007). Including pro-environmental attitude as a control variable allowed us to examine the unique predictive effects of guilt and pride independently of pro-environmental attitude. In line with previous research (Bamberg & Möser, 2007), we also expect that pro-environmental descriptive norms will be positively related to pro-environmental behavior.

To our knowledge the current study is the first to investigate the reciprocal relationships between the emotions of pride and guilt and everyday environmental behavior. In addition, we offer the first examination of the extent to which the relationships between these emotions and behavior are moderated by perceived social norms. Our contributions are both conceptual and methodological in nature. Previous research has only examined the emotions of pride or guilt induced through external feedback about a person's overall environmental behavior (Mallett et al., 2013) or the behavior of an in-group (Ferguson & Branscombe, 2010; Harth et al., 2013; Mallett,

2012; Mallett et al., 2013; Rees et al., 2015). Our use of an experience sampling study that prompts brief self-reflection about one's own behavior and emotions during a typical day more closely reflects people's everyday experiences. As we noted above, we believe that this is an important contribution to the research given that individuals' impact is made up of the behavioral decisions that they make in their everyday lives. Moreover, almost all previous studies measured pro-environmental behavior resulting from the experience of pride or guilt as the willingness, desire, or intention to engage in pro-environmental behavior as opposed to actual engagement in pro-environmental behavior. The current study extends on that research by examining self-reports of actual behavior as they occur during a day. Finally, the current study examines the relative importance of guilt and pride in relation to environmental behavior. Understanding whether one or the other emotion may be more strongly linked to environmental behavior provides insights that can inform the affective components of interventions.

Method

Participants, Design, and Procedure

Ninety-six Australian university students ($M_{\text{age}} = 19.06$ years, $SD_{\text{age}} = 2.94$ years) participated in this study for course credit. Sixty-one were female and 35 were male.

An experience sampling design was used, which included two stages over a period of three days. In the first stage, which always took place on a Monday, participants completed a paper-and-pencil survey assessing perceived pro-environmental descriptive norms and pro-environmental attitude. After completing these measures, participants were given hand-held electronic devices (iPod Touch) and instructions for the next part of the study.

In the second stage of the study, participants filled out a self-report survey each day for three consecutive days (always Tuesday, Wednesday, and Thursday) at four specific times: 10 am, 1 pm, 4 pm, and 7 pm. Each survey asked participants to report their engagement in environmental behavior during the preceding 2.5 hours, as well as any pride and guilt felt about this behavior. Participants were given the option to receive reminders by email, text message, or both about completing the surveys at the requested times. Eighty-nine participants opted to receive reminders and seven participants declined to receive reminders. Participants returned the electronic devices to the first author on Friday, when they were also debriefed.

General Survey Measures

Pro-environmental descriptive norms. The items used to measure pro-environmental descriptive norms referred to general engagement in pro-environmental behavior by important people in the participants' lives including friends and peers. The three items ($\alpha = .75$) were: "Most people who are important to me act in environmentally-friendly ways," "Most people who are important to me try to conserve resources," and "Most of my friends and peers engage in

environmentally-friendly behaviors.” Participants rated their agreement with each item on a scale from 1 (*disagree strongly*) to 5 (*agree strongly*).

Pro-environmental attitude. Pro-environmental attitude was measured using all 15 items ($\alpha = .64$) from New Ecological Paradigm (NEP; Dunlap et al., 2000). Example items include “Humans have the right to modify the natural environment to suit their needs” (reverse-scored) and “If things continue on their present course, we will soon experience a major ecological catastrophe.” Participants rated each item on a scale from 1 (*disagree strongly*) to 5 (*agree strongly*).

Daily Survey Measures

Pro-environmental behavior. Pro-environmental behavior was measured using a list of common pro-environmental behaviors that are shown in Table 1 (Bamberg & Möser, 2007). Participants indicated whether or not they carried out each behavior during the preceding 2.5 hours by checking “Yes” (coded as 1), “I could have, but I didn't” (coded as 0), or “I did not need to” (coded as missing data, as this response is not relevant to our research question). At each measurement point, the scores were averaged to create a composite score between 0 (participant did not carry out any of the pro-environmental behaviors when the opportunity arose) and 1 (participant carried out all pro-environmental behaviors that he/she had the opportunity to).

Table 1

List of Pro-environmental Behaviors Included in the Pro-environmental Behavior Index

Pro-environmental Behavior
Recycle paper/cardboard
Recycle plastic/glass/tins/containers
Conserve water (for example: took short shower, used as little water as possible while washing hands)
Save electricity (for example: turned off lights that weren't needed)
Reuse paper for taking notes
Use a reusable cup/container for drinking rather than using disposable cups
Use public transportation, walk or ride a bike instead of driving a car or other vehicle
Appropriately dispose of non-recyclable waste
Turn off digital devices (for example: computer, iPad)
Print to reduce paper (for example: printed double-sided, printed multiple pages per sheet)

Pride and guilt about environmental behavior. The measures of pride and guilt about environmental behavior were adapted from The State Shame and Guilt Scale (Marschall, Sanftner, & Tangney, 1994). Three emotion terms were used to assess each emotion: “proud,” “content,” and “pleased with myself” for pride, and “guilty,” “remorseful,” and “regretful” for guilt. Participants rated the extent to which they experienced each emotion term with regard to their “behaviors that impact on the environment” during the preceding 2.5 hours on a scale from 1 (*not at all*) to 5 (*completely*). The measures of pride and guilt had reasonably high internal reliability at each time point, ranging from $\alpha = .77$ to $\alpha = .91$ for the pride measure and from $\alpha = .57$ (two time points had an alpha below .60, the remaining time points had an alpha above .60) to $\alpha = .88$ for the guilt measure.

Results

Overview of Analyses

The data collected for this study have a multilevel structure in which multiple data points (i.e., within-person level) were collected for each participant (i.e., between-person level). Thus, we used random coefficient modeling with hierarchical linear modeling software (HLM; Raudenbush & Bryk, 2002; Raudenbush et al., 2004) to test our hypotheses. Consistent with recommendations by methodologists, pro-environmental descriptive norms and pro-environmental attitude, the between-person level variables, were centered at the grand mean. The within-person level variables—pro-environmental behavior, pride, and guilt—were centered at each person’s mean (Hofmann et al., 2000).

All the within-person variables (i.e., pro-environmental behavior, as well as pride and guilt about environmental behavior) were measured at each daily measurement time point. We examined the role of pro-environmental behavior as a predictor variable (i.e., in shaping feelings of guilt and pride reported at the same time-point) as well as an outcome variable (i.e., in being shaped by feelings of guilt and pride reported at the immediately preceding time-point). We use the terms, *subsequent* and *previous*, to indicate the chronological order in which the variables were recorded.

Our hypotheses specify three outcome variables: pride about environmental behavior (Hypothesis 1), guilt about environmental behavior (Hypothesis 2), and engagement in pro-environmental behavior (Hypotheses 3, 4, 5, and 6). For each outcome variable, we analyzed two models (presented in Table 3 and Table 4). Model 1 reports the outcomes for the direct effects of the predictor variables only. Model 2 reports the outcomes for both the direct effects of the predictor variables, as well as all two-way interactions between the predictor variables. In analyses investigating the predictors of subsequent pro-environmental behavior, we also included previous pro-environmental behavior as a control variable. This allowed us to control for the influence of previous engagement in pro-environmental behavior on subsequent engagement in pro-environmental behavior (i.e., autocorrelation).

Preliminary Analyses

We asked our sample of 96 participants to complete 12 short surveys over three days at specific time-points (10 am, 1 pm, 4 pm, and 7 pm), potentially resulting in data from up to 1152 surveys (i.e., 12 surveys \times 96 participants). Seventy-seven surveys from 37 participants were not completed during the study. In addition, 126 surveys (from 69 participants) were not included in analyses because they were submitted at incorrect times: either more than five minutes before, or more than 30 minutes after, the specified times. Taken together, 949 responses out of a possible 1152 were included in the final analyses (response rate of 82.38%). Participants completed an average of 9.89 surveys out of 12 ($SD = 1.81$, range = 4 to 12).

Descriptive statistics and correlations are presented in Table 2. On average, participants reported engaging in relatively high amounts of pro-environmental behavior when the opportunity arose, but there was also substantial variation in behavior ($M = 0.78$, $SD = 0.17$). The intra-class correlation coefficient (ICC) for pro-environmental behavior indicated that 37% of the total variance in pro-environmental behavior could be explained by mean differences between participants (i.e., stable characteristics such as pro-environmental attitude). This means that 63% of the total variance in pro-environmental behavior could be explained by within-person or daily factors (e.g., the experience of specific emotions) as well as error variance.

Table 2

Descriptive Statistics and Correlations of Study Variables

Variable	<i>M</i>	<i>SD</i>	α	τ_{00}	σ^2	ICC	1	2	3	4
<i>Within-person variables</i>										
1. Pro-environmental behavior	0.78	0.17	—	0.02	0.04	.37	—			
2. Pride about environmental behavior	2.02	0.76	.77	0.53	0.39	.57	.18	—		
3. Guilt about environmental behavior	1.20	0.22	.69	0.04	0.13	.23	-.07	.17	—	
<i>Between-person variables</i>										
4. Pro-environmental descriptive norms	3.27	0.66	.75	—	—	—	.23*	.11	-.04	—
5. Pro-environmental attitude	3.59	0.33	.64	—	—	—	.24*	.11	.04	.12

Note. $N = 96$. The means, standard deviations, and bivariate correlations of the within-person study variables were calculated by aggregating each participant's data across all data collection time points. The reliability for the within-person variables, pride and guilt, Cronbach's alpha, was calculated using the data from the first data collection point (i.e., Tuesday at 10am). Pro-environmental behavior was measured using a formative scale of binary items; we, therefore, did not calculate internal consistency (Bollen & Lennox, 1991; MacKenzie, Podsakoff, & Burke Jarvis, 2005). The intraclass correlation coefficient (ICC) is calculated by dividing the between-person variance component (τ_{00}) of the null model (i.e., the model with no predictors at Level 1 or 2) by the sum of τ_{00} and the within-person variance component (σ^2) of the null model. The result is the percentage of the variance in the daily measure due to between-person differences (Bolger & Laurenceau, 2013). *M* = mean. *SD* = standard deviation. α = Cronbach's alpha.

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

Participants generally reported feeling “*a little*” proud of their environmental behavior ($M = 2.02$, $SD = 0.76$) during the preceding 2.5 hours. Participants also reported feeling little to no guilt about their environmental behavior during the preceding 2.5 hours, and interindividual variation was lower than for pride ($M = 1.20$, $SD = 0.22$). The ICCs for pride and guilt about environmental behavior indicated that 57% and 23%, respectively, of the total variance in these variables resided at the between-person level. Pro-environmental descriptive norms ($M = 3.27$, $SD = 0.96$) and pro-environmental attitude ($M = 3.59$, $SD = 0.33$) had means slightly above the scale mid-points.

We also assessed whether there was a tendency for participants to change their level of engagement in pro-environmental behavior as well as their level of experiencing pride and guilt from the beginning until the end of the study period. In other words, we examined whether taking part in the study influenced participants’ reported emotion and behavior. We did this by correlating time (i.e., chronological order of data collection time point) with each of the study variables. There were no significant correlations between time and pro-environmental behavior ($\gamma = 0.03$, $p = .367$), pride ($\gamma = 0.01$, $p = .836$), or guilt ($\gamma = 0.05$, $p = .149$).

Tests of Hypotheses

Predicting levels of pride and guilt about environmental behavior. Table 3 presents the results of HLM analyses for the outcome variables, pride and guilt about environmental behavior. Within time points (i.e., regarding data about behavior and emotions experienced during the same 2.5-hour period), pro-environmental behavior was positively related to pride about environmental behavior, and negatively related to guilt about environmental behavior ($\gamma = 0.66$, $p < .001$ and $\gamma = -0.45$, $p < .001$, respectively), providing support for Hypotheses 1 and 2.

Predicting pro-environmental behavior from prior feelings of pride and guilt. Table 4 presents the results of HLM analyses for subsequent pro-environmental behavior as the outcome variable. Neither pride nor guilt about environmental behavior were directly related to subsequent pro-environmental behavior ($\gamma = 0.02$, $p = .240$ and $\gamma = 0.02$, $p = .680$, respectively). These findings indicate that Hypotheses 3 and 4 were not supported.

Table 3

HLM Results for Models Predicting Pride and Guilt about Environmental Behavior

Predictor	DV: Pride about Environmental Behavior						DV: Guilt about Environmental Behavior					
	Model 1			Model 2			Model 1			Model 2		
	γ	SE_{γ}	p	γ	SE_{γ}	p	γ	SE_{γ}	p	γ	SE_{γ}	p
Intercept	2.04	.08	<.001***	2.04	.08	<.001***	1.21	.02	<.001***	1.21	.02	<.001***
<i>Within-person variable</i>												
Pro-env. behavior	.65	.13	<.001***	.66	.13	<.001***	-.44	.08	<.001***	-.45	.08	<.001***
<i>Between-person variables</i>												
Pro-env. descriptive norms	.08	.12	.496	.09	.12	.459	-.04	.03	.184	-.02	.04	.654
Pro-env. attitude	.23	.23	.316	.27	.24	.260	-.01	.06	.828	.04	.07	.625
<i>Cross-level moderation</i>												
Pro-env. behavior × Pro-env. descriptive norms				.09	.20	.636				-.18	.12	.148
Pro-env. behavior × Pro-env. attitude				.31	.39	.439				-.35	.25	.161

Note. HLM = hierarchical linear modeling; γ = unstandardized coefficient; SE_{γ} = standard error of γ . Pro-env. = pro-environmental.

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

Table 4

HLM Results for Models Predicting Subsequent Pro-environmental Behavior

Predictor	DV: Subsequent Pro-environmental Behavior					
	Model 1			Model 2		
	γ	SE_{γ}	p	γ	SE_{γ}	p
Intercept	0.77	.02	<.001***	0.77	.02	<.001***
<i>Within-person variables</i>						
Previous pro-environmental behavior	.04	.06	.496	.03	.06	.555
Pride about environmental behavior	.01	.02	.655	.02	.02	.240
Guilt about environmental behavior	.03	.04	.466	.02	.04	.680
<i>Between-person variables</i>						
Pro-environmental descriptive norms	.04	.03	.133	.05	.03	.068
Pro-environmental attitude	.18	.06	.001**	.17	.06	.003**
<i>Cross-level moderation</i>						
Pride about EB \times Pro-env. descriptive norms				.10	.02	<.001***
Pride about EB \times Pro-environmental attitude				-.08	.05	.128
Guilt about EB \times Pro- env. descriptive norms				-.06	.05	.241
Guilt about EB \times Pro-environmental attitude				.10	.10	.337

Note. HLM = hierarchical linear modeling; γ = unstandardized coefficient; SE_{γ} = standard error of γ . Pro-env. = pro-environmental. EB = environmental behavior.

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

Hypotheses 5 and 6 predict that pro-environmental descriptive norms would moderate the relationships between pride and guilt about environmental behavior and subsequent pro-environmental behavior, such that these relationships would both be stronger for people who perceive more positive descriptive norms. Table 4 shows a significant cross-level interaction effect between pro-environmental descriptive norms and pride about environmental behavior on subsequent pro-environmental behavior ($\gamma = 0.10, p < .001$). We examined this interaction effect using a simple slope analysis for cross-level interactions (Preacher et al., 2006): Subsequent pro-environmental behavior was regressed on pride at more positive (i.e., one standard deviation above the mean) and less positive (i.e., one standard deviation below the mean) values of pro-environmental descriptive norms (see Figure 1). Results showed that the simple slope for participants who perceived more positive pro-environmental descriptive norms was positive and significant ($B = .07, SE = 0.03, t = 2.80, p = .005$). In contrast, the simple slope for people who perceived less positive pro-environmental descriptive norms was non-significant ($B = -.04, SE = 0.02, t = -1.80, p = .072$). Together, these results support Hypothesis 5: The impact of pride on subsequent pro-environmental behavior is strengthened in the presence of a social context that promotes pro-environmental behavior through the perceived behavior of others.

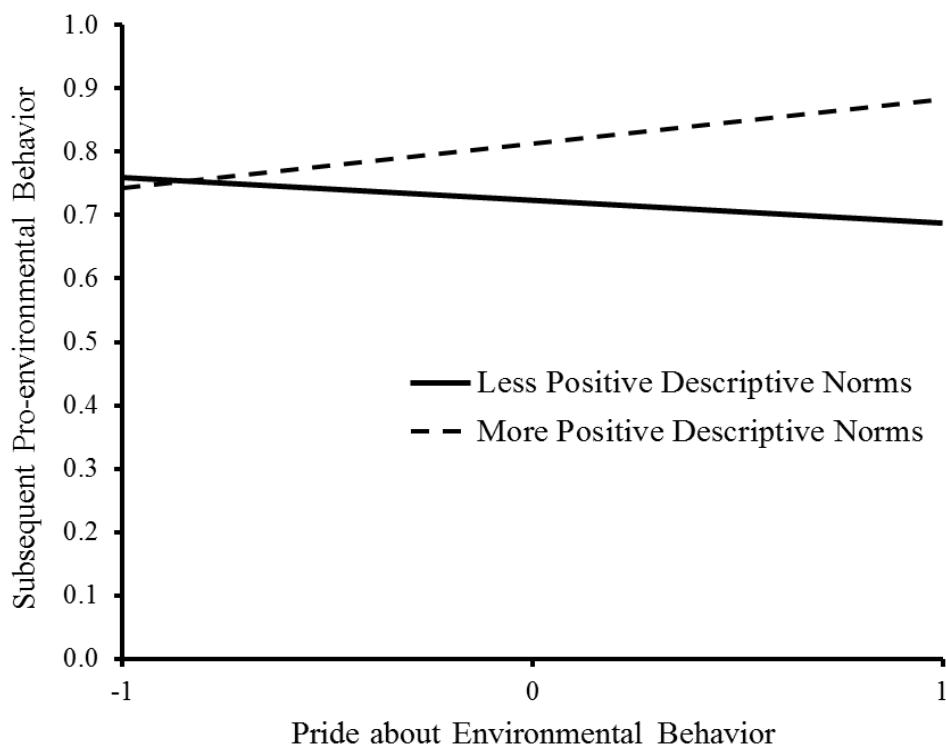


Figure 1. Graph of the moderating effect of pro-environmental descriptive norms on the relationship between pride about environmental behavior and subsequent pro-environmental behavior.

We did not find an interaction effect between pro-environmental descriptive norms and guilt about environmental behavior on subsequent pro-environmental behavior ($\gamma = -0.06, p = .241$). Thus, Hypothesis 6 was not supported.

In line with previous research, pro-environmental attitude ($\gamma = 0.17, p = .003$) was directly and positively related to engagement in pro-environmental behavior. In contrast, pro-environmental descriptive norms were not directly related to pro-environmental behavior ($\gamma = 0.05, p = .068$; Table 4). Subsequent pro-environmental behavior was also not predicted by previous pro-environmental behavior ($\gamma = 0.03, p = .555$; Table 4).

Discussion

The goals of this study were to examine relationships between pro-environmental behavior and experiences of pride and guilt that people experience during their day, and the role of perceived pro-environmental descriptive norms in moderating these relationships. Specifically, we aimed to answer the three following research questions: During a typical day, does environmental behavior lead to feelings of pride and guilt? (Research Question 1); During a typical day, do feelings of pride and guilt lead to environmental behavior? (Research Question 2); and, Do social norms influence the relationship between pride and guilt and subsequent pro-environmental behavior? (Research Question 3).

Pride and Guilt as Outcome Variables

In line with expectations, results showed that engagement in pro-environmental behavior was positively associated with feelings of pride and negatively associated with feelings of guilt about environmental behavior (Hypotheses 1 and 2). This supports theorizing on pride and guilt suggesting that pride and guilt arise following engagement in socially-desired behaviors, such as pro-environmental behavior (Tangney et al., 2007; Tracy & Robins, 2007b). These findings also allow us to address Research Question 1 in the affirmative: During a typical day, engagement in pro-environmental behavior is associated with increased feelings of pride and decreased feelings of guilt about environmental behavior. As pro-environmental behavior, pride, and guilt were measured during the same time period, we are unable to make definitive claims about causality. The current study is the first to show that personal feelings of pride are related to one's own engagement in pro-environmental behavior; previous work has only demonstrated that feedback about an in-group's behavior invokes a feeling of pride (Harth et al., 2013). The current study is also the first to demonstrate that findings about the relationships between pride and guilt and pro-environmental behavior generalize outside of an experimental setting (see Harth et al., 2013; Mallett et al., 2013; Rees et al., 2015) to people's experiences as they live their daily lives.

Subsequent Pro-environmental Behavior as Outcome Variable

Contrary to expectations, feelings of pride about previous environmental behavior did not have a direct effect on subsequent engagement in pro-environmental behavior (Hypothesis 3). We did, however, find a moderating effect of pro-environmental descriptive norms on this relationship (Hypothesis 5): When participants perceived that people who are important to them do more for the environment (i.e., more positive pro-environmental descriptive norms), the pride the participants felt about their previous behavior predicted continued engagement in pro-environmental behavior, even after controlling for prior levels of environmental behavior. This finding accords with functionalist theories of moral emotion which state that the feelings of pride and guilt arising from a sense of what is good or effective behavior (i.e., descriptive norms) can, in turn, motivate approach-oriented or prosocial behavior (Tangney & Dearing, 2002; Tracy et al., 2007). Thus, in a context of more positive pro-environmental descriptive norms, the motivation to engage in pro-environmental behavior should be stronger, leading to more subsequent pro-environmental behavior. In other words, our finding suggests that the social context may be particularly important for feelings of pride about environmental behavior to translate into continued pro-environmental action.

We did not find a direct effect for guilt about environmental behavior on subsequent pro-environmental behavior (Hypothesis 4), nor did we find an interaction effect between pro-environmental descriptive norms and guilt about environmental behavior on subsequent pro-environmental behavior (Hypothesis 6). This lack of effects of guilt could be due to the low levels of guilt that participants in our study felt about not engaging in environmental behavior. The low levels of guilt experienced by participants could arise for at least three reasons: First, the lack of pro-environmental action during any small period of time might not be enough to make most people experience more than weak feelings of guilt in relation to their environmental behavior. As suggested by previous research (Harth et al., 2013; Mallett, 2012; Mallett et al., 2013; Rees et al., 2015), perhaps feedback on lack of action over a longer period of time or about larger, more impactful behaviors is required to elicit feelings of guilt that are strong enough to trigger subsequent action. Second, in the course of their day, perhaps people find other ways to alleviate their guilt and this releases them from the need to take reparative action by engaging in subsequent pro-environmental behavior. For instance, people might engage in cognitive emotion regulation strategies (e.g., downplaying the negative impact of their bad behavior, or reducing their own responsibility for this bad behavior), or engage in easier behavioral strategies to reduce guilt (e.g., doing something good in another domain that is easy and low-cost to make themselves feel better) (Parkinson & Totterdell, 1999). Third, perhaps the public versus private nature of the behavior could have influenced the level of guilt felt. That is, the visibility of a behavior may impact on the

experience of moral emotions with more visible behaviors eliciting a stronger emotional response (Tangney & Dearing, 2002).

The findings above shed some light on our final two Research Questions, and highlight avenues for future research. With respect to Research Question 2, we did find that feelings of pride, but not guilt, led to further pro-environmental behavior in the course of participants' daily activities. However, this relationship was found only in a context of more positive pro-environmental descriptive norms. This finding also provides an affirmative answer to Research Question 3: Yes, social norms can influence the relationship between pride and subsequent pro-environmental behavior. We did not, however, find a relationship between guilt and subsequent pro-environmental behavior either directly or in the context of more positive pro-environmental norms. Future research is needed to determine whether certain aspects of particular pro-environmental behaviors (e.g., whether the outcome of the behavior has reparable or irreparable effects) influences the probability that people engage in such behavior when feeling guilty. Research is also needed to better examine how people experience and cope with guilt about their environmental behavior during the course of their day. This is an important question as an individual's overall environmental impact is made up of these moment-to-moment environmental decisions. It may also be fruitful for future research to consider how different types of norms, in addition to descriptive norms, interact with feelings of pride and guilt in predicting pro-environmental behavior. For example, previous research has shown that personal norms (i.e., personal or internalized standards for behavior; Schwartz, 1977) are important for pro-environmental action (Onwezen et al., 2013; Thøgersen, 2006, 2009). Thus, personal norms may be important factors in heightening or reducing the impact of pride and guilt on subsequent pro-environmental behavior.

In general, the current study contributes to the emerging literature on emotions and pro-environmental behavior in three ways. First, our findings show that individuals' engagement in specific pro-environmental behaviors during the course of their day is associated with feelings of pride and guilt about that environmental behavior. This confirms but extends previous research that has shown that external feedback about one's own or an in-group's overall pro-environmental behavior is related to feelings of pride or guilt. Second, we found that pride, for people who perceive more positive pro-environmental descriptive norms, seems to be a more important predictor of pro-environmental behavior than guilt. Thus, our findings provide some evidence that perceptions of the social context are important for feelings of pride to translate into pro-environmental action. Third, through the use of an experience sampling study design, we were able to examine the dynamic relationships between pro-environmental behavior and emotion outside of experimental contexts. That is, we were able to assess the dynamic relationships between pro-

environmental behavior and emotion as they play out during a typical day and show that such relationships really do occur in everyday life.

Limitations

Despite its strengths, this study has some procedural limitations that should be considered. First, pro-environmental behaviors were assessed using self-report measures. Doubts have been raised about the accuracy and validity of such measures (Kormos & Gifford, 2014), as participants' responses may be biased (e.g., due to a tendency to over-report behavior or to fail to accurately recall behavior). However, our use of a dichotomized response scale should minimize such bias: Research suggests that pro-environmental behavior can be more objectively reported by participants through the use of dichotomized response options for rating engagement in specific behaviors (Kaiser, Doka, Hofstetter, & Ranney, 2003). We also sought to increase the accuracy of participants' responses by minimizing the period of retrospection (to the 2.5 hours) prior to completing the survey, thereby improving recall accuracy (Schwarz, 2012).

A second limitation may be measurement reactivity, particularly in the form of satisficing (i.e., the limited effort that a participant may exert when answering questions; Barta, Tennen, & Litt, 2012; Krosnick, 1991). Because participants were asked to complete surveys multiple times each day, it may be possible that some participants satisficed. That is, participants may have been more likely to be fatigued or hurried when completing the multiple short surveys, and thus responded to questions inattentively. We attempted to minimize this possibility by limiting the length of the individual surveys and the overall study period, as well as using concrete, objective items, thereby constraining retrospection to recent and specific experiences that may be more easily recalled (Reis & Gable, 2000).

Third, study participants self-monitored their behavior over time, which may have led to unintended changes in behavior as a result of increased awareness of, and reflection on, their behavior (Barta et al., 2012; Reid, Hunter, & Sutton, 2009). As we noted in our results section, though, there were no changes in the frequency of reported behaviors and emotions during the study period. This suggests that participants were not overly influenced by the study. In addition, behavior and emotions were tracked over a relatively short time period of three days.

Conclusion

Numerous studies suggest that emotions can be powerful triggers of behavior (Dolan, 2002; Mauss et al., 2005). In the current experience sampling study, we contribute to the growing literature on emotions in the field of environmental psychology by showing that people are experiencing pride and guilt as a result of their engagement in pro-environmental behavior in their everyday lives. However, only in a context characterized by more positive pro-environmental social norms did experiences of pride about environmental behavior translate into subsequent pro-

environmental action. In contrast, experiences of guilt did not result in more or less subsequent pro-environmental behavior in our study. Overall, our findings suggest the need for more research on the complex links between everyday experiences of moral emotions such as pride and guilt and engagement in pro-environmental behavior, and that this research should take individuals' perceptions of their social context into account.

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CHAPTER 6

GENERAL DISCUSSION

The aim of this thesis was to examine relationships between affect and pro-environmental behavior as they occur in everyday life. Previous studies on this topic have primarily focused on affective experiences directly related to the environment or environmental issues, for example, negative anticipated emotions about engaging in household recycling (Carrus et al., 2008) or collective guilt about an in-group's negative environmental behavior (Harth et al., 2013). Past research has also mainly employed experimental and one-time survey designs, and has measured willingness, desire, or intention to engage in pro-environmental behavior rather than actual behavior. This past research has been fundamental in establishing the role of positive and negative emotions in predicting pro-environmental behavior. However, questions remain about how affective experiences that are not linked directly to the environment or environmental issues (e.g., diffuse moods or incidental affect) may influence pro-environmental behavior. Research has also not considered whether people's affective experiences really do lead to more or less engagement in pro-environmental behavior in their everyday lives (i.e., outside experimental settings).

In the following sections, I first present the main findings from the three empirical chapters and discuss answers to the three Research Questions presented in the General Introduction (Chapter 1) of this thesis: How do daily affective experiences relate to daily pro-environmental behavior? (Research Question 1); Are different types of daily affective experiences related to different types of daily pro-environmental behaviors? (Research Question 2); How do daily affective experiences interact with more stable characteristics of the individual (i.e., pro-environmental attitude) and context (i.e., perceived social norms) in relation to pro-environmental behavior? (Research Question 3). I then discuss the theoretical and practical implications of the present research, as well as its strengths and limitations and directions for future research. Lastly, I present a summary of the main conclusions.

Main Findings

The thesis addressed the questions of how daily affective experiences are related to pro-environmental behavior by first focusing on affect in the form of diffuse positive moods (i.e., positive affect unrelated to the natural environment or environmental issues) and, second, by examining the specific emotions of pride and guilt about environmental behavior. To most effectively present the findings from these two approaches, I first present the main findings from Chapter 3 and Chapter 4 that focus on positive affect in relation to pro-environmental behavior.

Then I present the main findings from Chapter 5 that focus on pride and guilt about environmental behavior.

Daily Positive Affect and Pro-environmental Behavior

The two daily diary studies presented in Chapter 3 and Chapter 4 showed that unactivated positive affect was positively related to basic pro-environmental behavior at work (Chapter 3) as well as in broader, everyday contexts (Chapter 4). That is, feeling relaxed and calm during the day was associated with greater engagement in pro-environmental behavior that is easily carried out and may be part of an individual's established behavioral framework. Moreover, pro-environmental social norms moderated the relationship between unactivated positive affect and basic pro-environmental behavior (Chapter 4): When pro-environmental social norms were perceived as less supportive—and, therefore, less prescriptive—participants were more likely to report engaging in pro-environmental behavior when they were feeling relaxed and calm.

Activated positive affect (e.g., feeling excited) was positively related to proactive pro-environmental behavior in everyday contexts (Chapter 4). That is, feeling excited and enthusiastic during the day was related to greater engagement in pro-environmental behavior that requires more effort and personal initiative (i.e., proactivity) to carry out. When the study context was restricted to the workplace (Chapter 3), activated positive affect was found to be positively related to proactive pro-environmental behavior, but only when employees had a less positive pro-environmental attitude, a pattern that was similar to the interaction reported above between unactivated positive affect and social norms on basic pro-environmental behavior. When employees had less positive (i.e., more ambivalent) pro-environmental attitude, they were more likely to let their feelings be their guide and, thus, reported greater engagement in proactive pro-environmental behavior when they were feeling excited and enthusiastic during the day.

These results offer several conclusions that contribute to the literature on pro-environmental behavior. First, they provide the first evidence that daily affective experiences are related to daily engagement in pro-environmental behavior in both specific (i.e., the workplace) and general (i.e., unspecified) settings. That is, the present research shows that people's affect and pro-environmental behavior are linked as they go about their daily lives. This complements previous research that has shown that affect and pro-environmental behavior are related to each other in experimental settings or when people are asked, as in one-time survey study designs, to provide mental abstractions (e.g., summaries) of the entirety of their pro-environmental behavior and affect (e.g., Ferguson & Branscombe, 2010; Harth et al., 2013; Mallett, 2012; Mallett et al., 2013; Rees et al., 2015).

Second, the current research is the first to show that affective experiences that are not directly targeted at the environment or environmental issues can predict pro-environmental behavior. Previous research has established that individuals' affective experiences about the

environment, such as worry about environmental problems (Ojala, 2008) or frustration with taking public transportation (Carrus et al., 2008), can predict pro-environmental behavior. The current research provides evidence that other types of affective experiences (e.g., positive mood) can shape the extent to which people engage in pro-environmental behavior. Such incidental affective experiences are commonplace in people's daily experience, and thus can serve as a fruitful influence on people's in-the-moment environmental decision-making.

Third, the findings show that different types of positive affect are related to different types of pro-environmental behavior: basic and proactive. Thus, it is important to distinguish between different levels of activation in affective experience and to consider different types of pro-environmental behavior based on level of effort and personal initiative required to carry out the behavior.

Finally, the results suggest that inter-individual differences, such as pro-environmental attitude and perceived social norms, should be taken into account when examining the relationships between positive affect and pro-environmental behavior. Such inter-individual characteristics (whether related to the individual or social context) establish boundary conditions for the relationships between daily positive affect and engagement in pro-environmental behavior. More specifically, when pro-environmental attitude and pro-environmental social norms are more positive and supportive, individuals' pro-environmental behavior is unrelated to their levels of positive affect. Thus, positive affect is more likely to trigger pro-environmental behavior when this behavior is not already being guided by attitudes or social norms.

Pride, Guilt, and Pro-environmental Behavior

The results of the experience sampling study presented in Chapter 5 show that, within a single time period, engagement in pro-environmental behavior was positively related to pride about environmental behavior and negatively related to guilt about environmental behavior. That is, when people reported engaging in pro-environmental behavior, they also reported more pride and less guilt about their environmental behavior. The results further show that pride about environmental behavior during one time period was related to engaging in pro-environmental behavior during the immediate following time period, but only for people who perceived more positive pro-environmental descriptive norms. This finding aligns with functionalist theories of moral emotion, which state that the feelings of pride arise from a sense of what is desirable behavior (i.e., social norms) (Tangney & Dearing, 2002; Tracy & Robins, 2007a). In turn, these feelings of pride motivate prosocial behavior. Thus, in a context of more supportive perceived pro-environmental social norms, the motivation to engage in pro-environmental behavior should be stronger, leading to more subsequent pro-environmental behavior. Guilt was not related to subsequent engagement in

pro-environmental behavior, either directly or in conjunction with perceived pro-environmental descriptive norms.

Several conclusions can be drawn from this study, which—along with the findings from Chapter 3 and Chapter 4—contribute to pro-environmental behavior theory and research. First, the findings presented in Chapter 5 provided further evidence that everyday affective experiences matter for pro-environmental behavior. That is, the emotions people experience as they go about their daily lives can influence, and be influenced by, their engagement in pro-environmental behavior.

Second, the current findings extend previous research focused on the specific emotions of pride and guilt. Previous research has shown that pride and guilt predict, or are predicted by, pro-environmental behavior (intentions). Research on this topic is limited, however, and only two studies have examined pride (Harth et al., 2013) or anticipated pride (Onwezen et al., 2013) as a predictor of pro-environmental behavior. Furthermore, all previous studies on the role of pride and guilt in relation to pro-environmental behavior (aside from two; Mallett, 2012; Rees et al., 2015) employed an experimental design whereby pride and guilt were evoked through explicit feedback about one's own environmental behavior or that of an in-group and pro-environmental behavior was measured as the willingness, desire, or intention to engage in pro-environmental behavior as opposed to actual engagement in pro-environmental behavior. The findings of the current research are novel in showing that pride and guilt are predicted by self-reported pro-environmental behavior.

Lastly, the results presented in Chapter 5 suggest that pride may be more important than guilt for encouraging pro-environmental behavior in everyday life, particularly in social contexts that value pro-environmental engagement. As this is the first study of how pride and guilt relate to pro-environmental behavior in daily life, this conclusion is necessarily tentative and more research on the topic of daily relationships between moral emotions and pro-environmental behavior is needed. Looking across the results of all three empirical chapters, this finding highlights the importance of considering how inter-individual and contextual factors (i.e., perceived social norms) may influence relationships between everyday, affective experiences and pro-environmental behavior.

Theoretical Implications

As the first set of studies on the relationships between affective experiences and pro-environmental behavior during people's everyday lives, this thesis yields several implications for theories and models of pro-environmental behavior. It provides evidence that daily, transient affective experiences are important to consider in relation to pro-environmental behavior; in particular, different types of affective experiences may be more important for different types of pro-environmental behavior. Results also show that certain inter-individual differences can act as

moderators of affect–pro-environmental behavior relationships. Finally, this thesis raises the possibility that daily factors other than affect may be important in predicting pro-environmental behavior, and thus should be considered in future theory development.

Research has demonstrated that emotions can be powerful triggers of behavior in general (Dolan, 2002; Mauss et al., 2005). However, the most influential theories of pro-environmental behavior research largely ignore affect as an important predictor of pro-environmental behavior in its own right; rather, affect is merely implied as contributing to the formation of attitudes and beliefs, which are proposed to be the main predictors of behavior (Ajzen, 1991, 2012; Schwartz, 1977). Previous research on affect and pro-environmental behavior has shown that certain types of affective experiences are related to pro-environmental behavior. That is, previous studies have demonstrated that general affective experiences that are directly linked to the environment (e.g., feeling hopeful about environmental problems; Ojala, 2008) relate to pro-environmental behavior (e.g., Kaiser, 2006; Kals & Müller, 2012; Mallett, 2012; Mallett et al., 2013; Onwezen et al., 2013). These studies are important because they establish links between affect and pro-environmental behavior; however, the types of affective experience examined resemble the affective component (i.e., the positive and negative feelings associated with the attitude object) of individuals' general pro-environmental attitudes (Petty et al., 2003). That is, these affective experiences may be closely related to one's pro-environmental attitude. The present research extends previous work by demonstrating that everyday experiences of affect matter for pro-environmental behavior. Put differently, in addition to affective experiences directly related to the natural environment or environmental behavior (e.g., guilt about environmental harm caused by one's self or in-group), the current findings suggest that other affective experiences, such as positive mood, are important to consider in pro-environmental behavior research. These findings align with the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001), which states that positive affect builds personal resources and encourages prosocial behavior.

Furthermore, this thesis shows that it may be important to distinguish between different types of affect, based not only on valence (i.e., positive vs. negative), but also on level of activation (i.e., activated vs. unactivated). It is important to consider different types of affective experience because the current thesis shows that they may have consequences for different types of pro-environmental behavior, basic and proactive pro-environmental behavior, which are distinguished based on level of proactivity and personal initiative to carry out. The findings showed that feeling calm and relaxed was related to basic pro-environmental behavior, whereas feeling enthusiastic and excited was related to proactive pro-environmental behavior. These findings align with appraisal theory, which posits that distinct affective experiences may be associated with specific types of action (Frijda et al., 1989; Izard, 1977). The findings also accord with the broaden-and-build theory

of positive emotions (Fredrickson, 1998, 2001) as well as with models of proactivity (Grant & Ashford, 2008; Parker et al., 2010) and motivation (Brehm, 1999; Seo et al., 2004). Positive affect not only builds personal resources and facilitates helping behavior in general (Fredrickson, 1998, 2001), but the spark of energy associated with activated positive affect also provides a feeling of being “energized to” take action (Parker et al., 2010), which results in increased effort toward a task or goal (Brehm, 1999; Seo et al., 2004; Seo et al., 2010).

The current thesis demonstrates that certain inter-individual differences can act as moderators of affect–pro-environmental behavior relationships. Prominent theories used in pro-environmental behavior research clearly state the importance of inter-individual differences, such as pro-environmental attitude and perceived pro-environmental social norms, in predicting pro-environmental behavior (Ajzen, 1991, 2012; Schwartz, 1977). This thesis suggests that such inter-individual characteristics are not only important to consider as direct predictors of pro-environmental behavior, but also as moderators in relationships between affect and pro-environmental behavior. When pro-environmental attitude and social norms are less positive and supportive (i.e., less prescriptive), then positive affect in the form of positive mood is more likely to influence behavior. In such cases, pro-environmental attitude and social norms no longer act as over-riding guides to behavior; rather, positive affect becomes a guide because it widens the range of action that comes to mind, encouraging engagement in positive behaviors (Fredrickson, 1998, 2001). In contrast, when social norms are more positive and supportive, then affect in the form of the specific moral emotion of pride is more likely to motivate continued engagement in pro-environmental behavior because pride stems from a sense of what is accepted in society and motivates prosocial behavior (Tangney & Dearing, 2002; Tracy et al., 2007).

Finally, this thesis raises questions about what other types of daily processes and factors may shape and encourage pro-environmental behavior. Chapter 2 proposed that the adoption of a multilevel perspective on stability and change in pro-environmental behavior would benefit pro-environmental behavior research by explicitly acknowledging the short-term (e.g., daily) variation in pro-environmental behavior and factors correlated with it. The focus of the current thesis was on just one factor discussed in Chapter 2, affect, but the findings of the current thesis suggest that the other factors and research questions presented in Chapter 2 may also have implications for theory and are worthy of future research. That is, the current findings provide evidence that a multilevel approach that considers both temporally stable (e.g., pro-environmental attitude) and fluctuating (e.g., daily affect) characteristics of the individual and context is useful for pro-environmental behavior research because such an approach could uncover more ‘in-the-moment’ influences of pro-environmental behavior that occur in everyday life.

Practical Implications

The current findings show that positive affect in the form of positive moods as well as pride in environmental behavior is positively related to pro-environmental behavior. This result suggests that appeals to affective aspects of engaging in pro-environmental behavior may be an important motivational force in promoting pro-environmental behavior (Steg & Vlek, 2009). Thus, environmental campaigns in the workplace and more broadly should utilize positive affect to encourage pro-environmental behavior. This could be in the form of creating a positive atmosphere at work or evoking positive emotions, such as pride, in public campaigns aimed at promoting pro-environmental behavior. Creating positive mood may also be important in consumers' green purchasing decisions as these may especially be influenced by in-the-moment factors.

In line with previous research (Ajzen, 1991; Bamberg & Möser, 2007; Cialdini et al., 1990), this thesis also demonstrates that pro-environmental attitude and social norms are important to consider in promoting pro-environmental behavior. Environmental campaigns should focus on promoting pro-environmental attitudes and social norms because these guide behavior. However, the current research shows that prompting positive affect can help fill in the gaps when pro-environmental attitude and social norms are less positive and supportive, and that evoking pride can enhance the effects of pro-environmental social norms when these are more positive and supportive. Thus, it would benefit pro-environmental campaigns to couple messages about pro-environmental attitude and social norms with positive affective prompts, such as images of people smiling or slogans such as "proud to be green."

Strengths, Limitations, and Future Research

Measurement Issues and Opportunities

All measures of pro-environmental behavior and affect used in the empirical chapters were self-report as opposed to more objective measures such as observer reports (e.g., peer ratings of pro-environmental behavior) or physiological indicators (e.g., heart rate and skin conductance to assess affective responses). Scholars have argued that self-report survey measures are well suited for daily diary or experience sampling studies for at least two reasons (Bolger et al., 2003; Gunthert & Wenze, 2012). First, these studies necessitate short and practical measures that can be administered to participants over several days or weeks. Second, participants are in the best position to report on their daily affect and pro-environmental behavior on a daily basis (Watson et al., 1988); reports of others such as friends or family members are likely to be deficient, because they do not have the opportunity to observe people's behavior every day across longer periods of time.

Furthermore, I employed general measures of pro-environmental behavior in the daily diary studies presented in Chapter 3 and Chapter 4 and a variety of common specific behaviors in the experience sampling study presented in Chapter 5 in order to encompass the full range of

environmental behaviors that can be carried out during the day. These studies were the first to examine daily relationships between affect and pro-environmental behavior. As such, it was important to cast a wide net in order to establish that daily affect is indeed related to daily pro-environmental behavior. That is, these studies examined the relationship between affect and pro-environmental behavior using a broad scope; focusing on one specific behavior (e.g., conserving water) might have been too restrictive, limiting the ability to find relationships between affect and pro-environmental behavior. The issue of behavior measurement provides fertile ground for future research: More nuanced study designs could be used to examine the associations between different types of affect and different types of pro-environmental behavior, depending on the specific research question at hand. For instance, study designs could be altered to allow for the investigation of these relationships within certain time periods and/or in more specific settings (e.g., evenings in the household or while traveling, relating to specific types of behavior). Such research would shed light on ways that affect shapes and is shaped by pro-environmental behavior that is beyond the scope of this thesis.

Causality is also an issue in this thesis. The current findings are correlational because both affect and pro-environmental behavior were measured at the same time point in time in all three empirical chapters. The one exception to this is the examination of how pride and guilt about environmental behavior at one time period related to engagement in pro-environmental behavior during the next subsequent time period (Chapter 5). This chronological staggering of predictor and outcome variables is one important condition for establishing causality, but it is not sufficient. Future research may use a combination of experimental and daily diary study designs, or other study designs such as cross-lagged panel designs (Kenny, 1975, 2005; Kenny & Harackiewicz, 1979), to further probe the causal direction of relationships between affective experiences and pro-environmental behavior.

Theoretical Issues and Opportunities

The research presented in this thesis is the first to apply a multilevel approach to the study of pro-environmental behavior. The findings demonstrated that approximately one third or more of the total variance in daily basic and proactive pro-environmental behaviors resided at the within-person level, and thus could be explained by within-person predictor variables, including but not limited to daily affect. That is, there is great potential for future research that examines within-person predictors of pro-environmental behaviors, such as day-to-day contact with others or daily events. It could also be fruitful to investigate the relationships between daily pro-environmental behavior and other types of daily affect not examined in this thesis. This includes other specific affective experiences (e.g., the specific feeling of interest) or other broader types of affective experience

(e.g., whether affective experiences are incidental or integral to the environmental behavior performed; see Cavanaugh, Bettman, Luce, & Payne, 2007).

This thesis examined relationships between affect and two types of pro-environmental behaviors: basic pro-environmental behavior and proactive pro-environmental behavior. The findings showed that there are fundamental differences between the two types of behaviors in terms of the affective experiences that relate to them as well as in terms of frequency. Basic pro-environmental behavior was reported to occur more frequently and was related to feeling calm and relaxed. In contrast, proactive pro-environmental behavior occurred more rarely and was related to feeling enthusiastic and excited. Also, the findings in Chapter 4 showed that social norms were related to basic, but not proactive pro-environmental behavior. Future research could further examine these two types of pro-environmental behavior to build a better understanding of their unique characteristics and the psychological and contextual factors related to them. Future research could assess, for example, the types of behaviors that individuals consider to be basic and proactive. Such knowledge could be used to better encourage one type of pro-environmental behavior over the other. For example, with more insight into factors relating to proactive pro-environmental behavior, an environmental campaign aiming to promote pro-environmental behavior that requires more effort and personal initiative (i.e., proactive pro-environmental behavior) would be more successful.

Finally, this thesis showed that certain inter-individual differences acted as moderators in the relationships between affect and pro-environmental behavior. In Chapter 3, pro-environmental attitude acted as a moderator. In Chapter 4 and Chapter 5, social norms were shown to moderate relationships between affect and pro-environmental behavior. The social norms measured in these chapters referred to descriptive and injunctive norms of peers and friends (Chapter 4) and important others (Chapter 5). This thesis highlights the need for more research on these and other potential moderators of the relationships between daily affective experiences and pro-environmental behavior. Other potential moderators could be in the form of inter-individual differences (e.g., personality) or different social norms (e.g., norms of other in-groups).

Conclusion

This thesis presents the first research in the pro-environmental behavior literature on relationships between affective experiences and pro-environmental behavior as people go about their everyday lives. The aim of this thesis was to provide answers to the following Research Questions: How do daily affective experiences relate to daily pro-environmental behavior?; Are different types of daily affective experiences related to different types of daily pro-environmental behaviors?; How do daily affective experiences interact with more stable characteristics of the individual (i.e., pro-environmental attitude) and context (i.e., perceived social norms) in relation to

pro-environmental behavior? This thesis answers these questions by showing that a range of affective experiences, from pride about one's own environmental behavior to diffuse positive moods, are linked to people's engagement in pro-environmental behavior in their everyday lives. It further shows that different types of affect are related to different types of pro-environmental behavior; specifically, feeling energized may promote pro-environmental behaviors that go above and beyond expectations. Finally, this thesis demonstrates that certain individual characteristics, such as pro-environmental attitude, moderate daily relationships between affect and pro-environmental behavior. In sum, this thesis provides the first evidence that everyday affective experiences may be important for pro-environmental behavior theory, and highlights the need for theory and research to consider everyday relationships between affect and pro-environmental behavior in the future.

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