

Emotions in the context of environmental protection: Theoretical considerations concerning emotion types, eliciting processes, and affect generalization

Helen Landmann
FernUniversität in Hagen

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Abstract

Emotions seem to be significant for pro-environmental behavior. Yet, questions about the differentiation, elicitation, and effects of emotions in the context of environmental protection remain. Specifically, current typologies of environmentally relevant emotions each cover only a subset of the relevant emotions. Furthermore, central environmental-psychological constructs such as emotional affinity towards nature are not explained well by current appraisal and emotion theories. Finally, the causal effects of emotions on pro-environmental behavioral intentions in experiments are rather weak and diminish over time, which conflicts with strong correlations between emotions and environmentally relevant intentions. The current work addresses these issues by (1) synthesizing types of environmentally relevant emotions, (2) differentiating paths to emotional reactions towards nature, and (3) considering the process of affect generalization for the consequences of emotion for environmentally relevant behavior. Partitioning affect along these dimensions helps capturing the broad range of environmentally relevant emotions, understanding how these emotions are elicited, and when they affect pro-environmental behavior.

Word Count: 157

Keywords: pro-environmental behavior, appraisal theory, moral emotions, emotional affinity towards nature, affect generalization

Zusammenfassung

Emotionen scheinen für umweltfreundliches Verhalten wesentlich zu sein. Allerdings sind wichtige Fragen zur Differenzierung, Auslösung und Auswirkung von Emotionen im Kontext Umweltschutz noch offen. So decken bestehende Typologien umweltrelevanter Emotionen jeweils nur einen Teil der relevanten Emotionen ab. Zudem werden zentrale umweltpsychologische Konstrukte wie die emotionale Affinität zur Natur nicht gut durch gängige Appraisal- und Emotionstheorien erklärt. Schließlich sind die kausalen Effekte von Emotionen auf umweltrelevante Verhaltensintentionen in experimentellen Studien eher gering und kurzlebig, was im Widerspruch zu den starken Korrelationen zwischen Emotionen und umweltrelevanten Intentionen steht. Die vorliegende Arbeit adressiert diese Themen durch (1) die Synthese von Typen umweltrelevanter Emotionen, (2) die Differenzierung von Pfaden zu emotionalen Reaktionen auf die Natur und (3) die Berücksichtigung von Affektgeneralisierung für die Auswirkungen von Emotionen auf umweltrelevantes Verhalten. Die Aufteilung von Affekten entlang dieser Dimensionen fördert das Verständnis über die Typen umweltrelevanter Emotionen, wie diese Emotionen ausgelöst werden, und unter welchen Bedingungen sie umweltfreundliches Verhalten beeinflussen.

Wörter: 154

Schlüsselwörter: umweltfreundliches Verhalten, Appraisal Theorie, moralische Emotionen, Emotionale Verbundenheit zur Natur, Affektgeneralisierung

Emotions in the context of environmental protection

Imagine a person who takes a walk through the park. Which emotions would this person experience? How would these emotions be elicited? And would these emotional experiences have consequences for the person's decisions and behavior? Environmental psychology made important contributions to these questions. Still, they are not answered completely. Emotions predict a large amount of variance in environmentally relevant behaviors and environmentally relevant behavioral intentions (Kals & Maes, 2002; Hahnel & Brosch, 2018). However, scholars do not agree on the types of environmentally relevant emotions (Böhm, 2003; Kals & Müller, 2012; Hahnel & Brosch, 2018). Hence, the answer to the question which emotions a person experiences depends on the typology at hand. Furthermore, although research can explain the elicitation of environmentally relevant emotions in many cases (Böhm, 2003), the processes leading to the elicitation of emotional experiences in nature (Kals, Schumacher, & Montada, 1999) are not clear. Finally, manipulating emotions reveals rather small and conditional effects (Chatelain, Hille, Sander, Patel, Hahnel, & Brosch, 2018; Schultz, Fielding, Newton, & Louis, 2018; Tarditi, Hahnel, Jeanmonod, Sander, & Brosch, 2020; Weinstein et al., 2015). Thus, whether an emotional experience is relevant for behavior cannot be reliably predicted. To address these issues, typologies of environmental emotions are synthesized and extended (section 1), processes that elicit emotional reactions in nature are proposed (section 2) and explanations for why and when environmentally relevant emotions affect decisions and behavior are provided (section 3). Addressing these questions about the types, elicitation, and consequences of emotions can advance predicting when a person acts in an environmentally friendly or harmful manner and how he or she feels about it.

1. What types of environmentally relevant emotions can be distinguished? A synthesis of emotion typologies

Environmentally relevant behaviors cover pro-environmental behavior such as recycling, energy conservation, and participation in protest for environmental protection, as well as environmentally harmful behaviors such as motor-car use, flying, extensive consumption, and participation in environmentally harmful leisure activities (Bamberg, 2013; Kaiser, 1998; Whitmarsh & O'Neill, 2010). Emotions that are elicited by these behaviors, by objects or people associated with these behaviors or by the natural environment itself can be considered as environmentally relevant emotions (Kals & Müller, 2012). However, research does not agree on one typology of environmentally

relevant emotions (Böhm, 2003; Kals & Müller, 2012; Hahnel & Brosch, 2018). In this first section, an integration and extension of the existing typologies is proposed to provide an overview of possible emotional influences on environmentally relevant behavior.

Emotions can be defined as episodes that are characterized by changes in appraisals, motor expression, autonomic physiology, action-tendency, and subjective feelings (Scherer, 2005). For instance, during an anger episode the person who experiences the emotion (the emoter) intuitively evaluates the situation as morally wrong (appraisal), which is associated with frowning (motor expression), increased heart rate and skin conductance (autonomic physiology) and an increased tendency to oppose the people responsible for the situation (action tendency). The emoter experiences these processes as being angry, indignant or outraged (subjective feelings).

[Existing typologies of environmentally relevant emotions cover only a subset of the relevant emotions]

Different typologies of environmentally relevant emotions have been proposed. However, each of these typologies covers only a subset of the relevant emotions: Böhm (2003) distinguishes between ethics-based other-focused emotions (e.g., anger), consequence-based retrospective emotions (e.g., sympathy, sadness), ethics-based self-focused emotions (e.g., guilt), and consequence-based prospective emotions (e.g., fear). These emotions are strongly associated with pro-environmental behavior and can be differentiated on the basis of appraisals and action tendencies. For instance, anger about environmental destruction is predicted by appraisals of humans' moral responsibility and predicts the tendency to punish those responsible, whereas fear is predicted by appraisals of threat to humans and predicts the tendency to help those threatened by environmental destruction (Böhm & Pfister, 2000). However, this typology is limited to negative emotions.

Kals and Müller (2012) address this gap and distinguish between emotional burden and worries (e.g., fear of climate change), emotions associated with environmentally relevant behavior (e.g., enjoying car driving), affective connection to nature, and moral emotions (e.g., guilt or anger). However, whether these emotion categories are associated with different appraisals and action-tendencies is not clear. Furthermore, affective connection to nature is not an emotional episode. It rather constitutes an affective attitude, which can be defined as a "long-term affective disposition" towards an object (Scherer, 2005, p. 703). Still, affective connection to

nature may be associated with emotions: Specific emotions such as episodes of awe while being in nature may contribute to the formation of this affective attitude (see section 2).

Finally, Hahnel and Brosch (2018) differentiate between positive feelings elicited by nature (e.g., awe elicited by nature), positive feelings about own pro-environmental behavior (e.g., pride about own recycling behavior), negative feelings elicited by environmentally harmful behavior (e.g., anger about large CO₂ emissions), negative feelings elicited by obstruction of environmental friendly behavior (e.g., anger about shortage in public transport), and negative feelings about environmental protection (e.g., anger about CO₂ taxes). In contrast to the other two approaches, this approach is mainly oriented at the object of the emotion rather than the emotion types themselves.

These environmentally relevant emotions overlap with the framework of moral emotions. Environmentally relevant behavior affects not only the actor him- or herself but also others. For instance, air pollution in big cities affects all citizens independent of their contribution to the pollution, and CO₂ emissions tend to affect residents of the global south and future generations more than current residents of the global north who are responsible for the largest part of CO₂ emissions caused by humans.

Environmentally relevant behavior is therefore often associated with moral considerations and moral emotions (see Kals & Maes, 2002, for a review). To specify the range of moral emotions, Haidt (2003) distinguishes between four moral emotion families: self-condemning emotions (e.g., guilt), other-condemning emotions (e.g., anger), other-suffering emotions (e.g., compassion), and other-praising emotions (e.g., elevation, awe, being moved). According to Haidt (2003), every emotion can be moral to the extent it is elicited by selflessness. Self-condemning, other-condemning, other-suffering and other-praising emotions are argued to be the prototypical moral emotions because they are very likely elicited in situations that do not directly affect the emoter's well-being. However, threat-related emotions such as fear can also be moral to the extent they are directed at the negative consequences for others (e.g., concerns about the consequences of climate change for future generations). Similarly, self-praising emotions such as pride can be moral to the extent they are directed at the positive consequences for others (e.g., being proud of pro-environmental innovations for future generations). Hence, the emotions relevant for pro-environmental behavior cannot be

divided into moral and non-moral emotions in general. Their moral content depends on the eliciting context.

[A synthesis of environmentally relevant emotion typologies and the framework of moral emotions provides an overview of possible affective influences on environmentally friendly and environmentally harmful behavior]

All emotions covered by the reviewed typologies potentially affect environmentally relevant behavior. Hence, a synthesis of the existing typologies is needed to provide an overview of possible affective influences on environmentally friendly and environmentally harmful behavior. This synthesis is shown in Table 1. Specifically, ethics-based other-focused emotions (Böhm & Pfister, 2000) are comparable with other-condemning emotions (Haidt, 2003) and ethics-based self-focused emotions (Böhm & Pfister, 2000) are comparable with self-condemning emotions (Haidt, 2003). These two emotion types are also covered by the negative feelings elicited by environmentally harmful behavior proposed by Hahnel and Brosch (2018). However, some environmentally relevant emotions are covered by a subset of these approaches only. Specifically, awe elicited by natural phenomena is covered by other-praising emotions (Haidt, 2003), by positive feelings elicited by nature (Hahnel & Brosch, 2018), and by affective connections to nature (Kals & Müller, 2012) but not by the typology proposed by Böhm and Pfister (2000). Moreover, fear about environmental destruction is covered by consequence-based prospective emotions (Böhm & Pfister, 2000) and by environmental burden and worries (Kals & Müller, 2012) but not by the typology proposed by Hahnel and Brosch (2018). Furthermore, compassion with victims of climate change is covered by other suffering emotions (Haidt, 2003) and moral emotions (Kals & Müller, 2012) only, pride about own pro-environmental behavior is explicitly mentioned by Hahnel and Brosch (2018) only, and enjoying car driving is covered by Kals and Müller (2012) only.

[please insert Table 1 about here]

These emotion types are associated with different appraisals. For instance, guilt is elicited by appraisals of one's own norm violations (e.g., Böhm, 2003; Tracy & Robins, 2006), anger is elicited by appraisals of others' norm violations (e.g., Böhm, 2003; Landmann & Hess, 2017), compassion is elicited by appraisals of others' suffering (e.g., Goetz, Keltner, & Simon-Thomas, 2010; Landmann & Hess, 2017), fear is associated with appraisals of anticipated negative consequences (e.g., Böhm, 2003; Smith et al., 1993), and being moved is elicited by appraisals of positive deviation from

standards such as outstanding helping behavior (e.g., Landmann, Cova, & Hess, 2019). On the basis of these appraisals, it is possible to predict when a specific emotion is elicited.

[The typology of environmentally relevant emotions enhances to predict when emotions and respective action-tendencies are elicited]

Furthermore, the pro-environmental emotion types are associated with different action-tendencies, which are states of action readiness (Scherer, 2005). For instance, fear is associated with the tendency to escape, anger with the tendency to punish the wrongdoer, and guilt with the tendency to correct the mistake (Roseman, Wiest, & Swartz, 1994). Some of these associations between specific emotions and specific action-tendencies have been supported in the context of environmental protection (see Table 1). For instance, anger about environmental destruction predicts pro-environmental commitment (Kals & Russell, 2001) and pro-environmental action intentions (Reese & Jacob, 2015). However, when considering different aspects of the behavior, anger specifically affects behavioral intentions to punish those responsible for the environmental damage (e.g. supporting financial or legal punishment of environmental destruction; Böhm & Pfister, 2000; Landmann & Rohmann, 2020). By contrast, guilt specifically affects behavioral intentions to repair the environmental damage (Ferguson & Branscombe, 2010; Harth, Leach, & Kessler, 2013). Hence, the emotion types seem to be relevant for different types of pro-environmental behavior. This has important implications for research and practice: If an environmentally relevant behavior is oriented at punishment (e.g., protesting for financial or legal punishment of environmental destruction), anger is an important driver of that behavior. By contrast, if environmentally relevant behavior is oriented at reparation (e.g., donating for forestation), guilt is an important driver of that behavior.

Importantly, the environmentally relevant emotions listed in Table 1 are not necessarily good for the environment. For instance, anger about insufficient climate protection is associated with pro-environmental behavior but anger about too much pollution control is associated with environmentally harmful behavior (Montada & Kals, 1995). Similarly, enjoying nature is associated with pro-environmental behavior (Perkins, 2010) but enjoying car driving is associated with environmentally harmful behavior (Steg, 2005). Hence, whether an emotion enhances or hinders pro-environmental behavior depends on its object.

Although the typology of environmentally relevant emotions proposed in Table 1 is based on previous research, the differences and similarities between the emotions have not been systematically tested in the context of environmental protection. Furthermore, differences within an emotion type are also possible. For instance, research revealed differences between the appraisals of anger and contempt (e.g., Hutcherson & Gross, 2011; Landmann & Hess, 2018). Hence, systematically testing similarities and differences within and between the proposed types of environmentally relevant emotions is an interesting task for future research.

Taken together, typologies of environmentally relevant emotions and moral emotions can be synthesized. This integration enhances identifying specific appraisals and action-tendencies associated with each emotion and thus improves predicting the causes and consequences of emotions. However, it is not clear whether environmentally relevant emotions always start with an appraisal process and whether they reliably affect behavior. These questions are addressed in the following sections.

2. How are environmentally relevant emotions elicited? Different paths to emotional reactions towards nature

Emotional episodes usually start with appraisals. For instance, the appraisal that others illegitimately harm nature can elicit anger (see section 1). However, emotions that are elicited by experiences in nature may differ from that. The second part of this article addresses this question by proposing different paths to emotional reactions towards nature.

According to appraisal theories, emotions are elicited and differentiated based on appraisals, which are fast and intuitive evaluations of the world with regard to the emoter's values and well-being (Arnold, 1960; Clore & Ortony, 2008; Ellsworth & Scherer, 2003; Nerb & Spada, 2001). These appraisals map on five dimensions, which are acknowledged by most appraisal theorists (Ellsworth & Scherer, 2003): novelty, intrinsic pleasantness, goal-conduciveness, coping-potential and compatibility with standards. In other words, we intuitively evaluate whether a situation is new, pleasant, good for our goals, whether we can cope with it and whether the situation is compatible with our values. The results of these appraisals predict which emotion is elicited. For instance, rain can elicit frustration and sadness for people who planned to go sightseeing because they appraise the situation as incompatible with their goals. However, rain can also elicit relief and joy for farmers whose harvest depends on the weather because these people appraise the situation as compatible with their goals. Hence, emotions are

not just automatic reactions to specific stimuli. Rather, the same stimulus can elicit different emotions depending on the appraised relevance for the person's well-being and values.

According to these classical appraisal theories, appraising nature as relevant for humans elicits emotional reactions towards nature. People who agree that humans depend on a well-functioning nature in fact report more positive emotions towards nature (Hahnel & Brosch, 2018). However, people can think about the value of nature and still do not experience the same feelings that emerge when they are physically in nature. Hence, the appraisals considered by classical appraisal theories cannot sufficiently explain emotional experiences in nature, thus constituting only one path to emotions in nature, here referred to as path A.

[Different eliciting paths explain when and how experiences in nature elicit emotions]

Based on empirical findings, additional paths that explain emotional reactions towards nature can be proposed (see Figure 1). During experiences in nature people also appraise themselves in relation to nature. Such appraisals of the self as small and powerless compared to nature can elicit feelings of awe (Piff, Dietze, Feinberg, Stancato, & Keltner, 2015). Accordingly, appraising the own person in nature constitutes path B. In addition, walking through nature can directly elicit physiological reactions such as increased respiration, temperature, and blood pressure due to physical activation (Korpela, Borodulin, Neuvonen, Paronen, & Tyrväinen, 2014). These physiological reactions can be appraised as pleasant or unpleasant. The process of appraising bodily changes is known as proprioceptive feedback (Scherer & Zentner, 2001). In this case, physiological changes are the starting point of the emotional episode and appraisals follow (path C). Moreover, some people describe nature as if it was human (Tam, Lee, & Chao, 2013). Descriptions of mute forests, the agitated sea, or suffering nature exemplify this anthropomorphism. Twittering birds or periodic sounds of rustling leaves may be perceived as if nature expresses joy or serenity. Perceived emotional expressions can spread to the perceiver, a process called emotional contagion (Hatfield, Cacioppo, & Rapson, 1993). Emotional reactions to nature that are based on emotional contagion are referred to as path D. Furthermore, visual stimuli (sun shining through the trees) or vocal stimuli (rustling of leaves in the wind) can draw attention away from daily tasks and hence reduce appraisals that are related to stress (path E). This process may contribute to the stress-reducing effect of restoration in nature (e.g.,

Tyrväinen et al., 2014). Finally, specific aspects of nature can be associated with emotionally laden memories (e.g. experiences in childhood), which can elicit strong emotions (Schulkind, Hennis, & Rubin, 1999). These memory effects are considered as path F.

[please insert Figure 1 about here]

The empirical findings reported above suggest that all processes proposed in Figure 1 exist. However, their prevalence and interaction during experiences in nature has not been systematically investigated. Most of these paths rely on experiences in nature. Inducing emotional reactions to nature in the laboratory is thus limited. Hence, future research could investigate the prevalence and interaction of the different paths with field studies.

Considering these different paths enhances explaining when and how experiences in nature elicit emotions: To what extent a person values nature, experiences his- or herself as small, the physical activation as pleasant, or nature as calm, are argued to elicit emotions along with distraction and memory effects. A variety of emotional reactions such as awe, joy, compassion, and serenity can arise from these paths. Emotional affinity towards nature can be regarded as affective attitudes (see section 1) that result from a combination of these emotional experiences. How these processes affect environmentally relevant behavior is addressed in the next section.

3. When do emotions affect environmentally relevant behavior? Affect generalization from emotional episodes to affective attitudes

The overview of environmentally relevant emotions in section 1 shows that specific emotions are associated with pro-environmental behavioral intentions. However, most of these studies are correlative. The causal links between emotions and environmentally relevant behavior is less clear. Experimentally manipulated emotions can enhance pro-environmental behavioral intentions, but these effects are small, depend on individual differences and diminish with a time delay (Chatelain et al., 2018; Schultz et al., 2018; Tarditi et al., 2020; Weinstein et al., 2015; Schwartz & Loewenstein, 2017). The notion of affect generalization may account for this.

[Affect generalization: Intense or frequent emotional episodes can form affective attitudes, which predict behavioral intentions]

The process of affect generalization was proposed by Paolini and colleagues (2006) who differentiate between episodic and chronic affect in the context of intergroup relations. They define episodic affect as “situationally created and transient

affective states” (Paolini, Hewstone, Voci, Harwood, & Cairns, 2006, p. 212), which is consistent with the definition of emotion (Scherer, 2005, see section 1). By contrast, chronic affect is defined as “enduring and stable affective reactions” to a specific object (Paolini et al., 2006, p. 212). Hence, chronic affect is consistent with the definition of affective attitudes (Scherer, 2005, see section 1). According to Paolini et al. (2006), repeated experiences of episodic affect (emotions) can develop into chronic affect (affective attitudes) and this constitutes the process of affect generalization. This notion was later refined by Kauff et al. (2017), who proposed and found that episodic affect influences behavioral intentions mediated by chronic affect. In other words, emotional stimuli affect behavioral intentions particularly well if they elicit not only a short emotional episode but change general feelings towards the object of emotion as well.

[please insert Figure 2 about here]

The notion of affect generalization can be transferred to the context of environmental psychology. As illustrated in Figure 2, watching a movie about environmental destruction (the stimulus) can induce anger (an emotional episode). For some people, this emotional reaction changes feelings about environmental destruction in general (chronic affect or affective attitudes). However, to form an intention for a specific behavior requires some level of reflection but the effect of emotional episodes diminishes over time (Schwartz & Loewenstein, 2017). Hence, general feelings (chronic affect or affective attitudes) may explain environmentally relevant behavioral intentions better than short emotional episodes. As chronic affect is influenced by multiple episodic emotions, one emotional episode has only limited influence on chronic affect.

These assumptions are consistent with a recent study about the Hambach forest (Landmann & Rohmann, 2020, Study 2). The Hambach forest (“Hambacher Wald”) was strongly reduced for coal mining during the last decades, which was accompanied by numerous protests. In this study, participants watched a video clip that showed either injustice related to the forest clearance (injustice condition), how people can jointly protect the forest (collective efficacy condition), or scientific facts about the Hambach forest (control condition). Subsequently, participants indicated how they felt and what they intended to do while watching the video, what they feel towards the actors in the Hambach forest in general, and whether they intend to participate in pro-environmental collective action in the future. Videos about forest clearance and collective action for forest protection strongly affected thoughts, feelings, and intentions during the video (episodic affect / emotions) but the videos only scarcely affected general feelings

towards actors in the Hambach forest (chronic affect / affective attitudes) and general pro-environmental action intentions. In other words, most people did not change their behavioral intentions just because they watched a single video. Affective attitudes towards actors in the Hambach forest predicted intentions to engage in collective action better. This pattern of results is compatible with the model of affect generalization: Emotions are relevant for behavioral intentions only if they generalize to affective attitudes.

The involvement of specific emotion components may differ between these levels of affect. Emotional episodes on the episodic affect level comprise all components of emotion. For instance, watching a movie about environmental destruction can induce physiological reactions such as increased heart rate. However, when thinking about environmental destruction in general, people may feel angry, but the physiological changes associated with these feelings are usually less intense. Therefore, autonomous physiology and motor expression are assumed to be less intense on the level of chronic affect (see Figure 2).

The differentiation between episodic affect (emotions) and chronic affect (affective attitudes) has important implications for research and practice. Some studies on environmentally relevant emotions assess affective attitudes - feeling angry about environmental destruction (Hahnel & Brosch, 2018) or emotional affinity towards nature (Kals et al., 1999) - rather than emotional episodes. By contrast, causal effects of emotion are usually studied with stimuli that elicit emotional episodes (e.g., a vignette or film, Chatelain et al., 2018; Schultz et al., 2018; Weinstein et al., 2015). However, the dependent variables that are usually used (e.g. pro-environmental behavioral intentions) may be affected by affective attitudes and only indirectly by emotional episodes (see Figure 2). This may explain the small or conditional effects in these studies. Future research could assess all components of emotions (i.e., appraisals, feelings, physiological reaction, action tendencies) on the episodic and the chronic level (see Landmann & Rohmann, 2020) to shed light on the causal effects of emotions for environmentally relevant behavior, which can then inform pro-environmental interventions.

4. Conclusion

Understanding the range, elicitation, and consequences of emotions in the context of environmentally relevant behavior can be enhanced by considering (1) types of environmentally relevant emotions, (2) different paths to emotional reactions towards

nature, and (3) affect generalization. Specifically, environmentally relevant emotion types can be identified that capture a broad range of positive and negative sentiments relevant for pro-environmental behavior. The integrated typology enhances choosing specific emotions when investigating affective influences on environmentally relevant behavior. These environmentally relevant emotions are elicited by different paths, which include classical appraisal processes such as appraising nature as valuable for humans but also paths that rely on experiences in nature such as physical activity. These paths can elicit emotional episodes such as awe (when the self is appraised as small in comparison to nature) or anger (when destruction of nature is appraised as morally wrong). Considering these eliciting paths enhances explaining when and how experiences in nature elicit emotions. Each of these emotions is associated with a specific action-tendency (e.g., anger with the tendency to punish the wrongdoer, guilt with the tendency to repair the damage). Hence, the integration of emotion typologies enhances predicting when specific emotions as well as specific action-tendencies are elicited. However, these emotional episodes including the readiness for a specific action diminish over time. This explains why a singly emotional episode does not necessarily affect environmentally relevant behavioral intentions. Still, a particularly impressive situation or multiple emotional episodes can translate to general feelings towards an object (e.g., emotional affinity towards nature or generalized anger towards environmental destruction) and these general feelings (affective attitudes) are strongly associated with environmentally relevant behavioral intentions. This model of affect generalization enhances predicting when emotions affect intentions for environmentally friendly or environmentally harmful behavior.

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Table 1. Environmentally relevant Emotion Types

Emotion Type	Appraisals	Action-Tendency
Self-condemning Emotions ^{abcd} (Guilt, Shame, Embarrassment)	Own norm violations	Correction (e.g., repair the environmental damage; Ferguson & Branscombe, 2010; Harth et al., 2013)
Other-condemning Emotions ^{abcd} (Anger, Disgust, Contempt)	Others' norm violations	Punishment (e.g. punish those responsible for environmental destruction, Böhm & Pfister, 2000; Landmann & Rohmann, 2020)
Self-praising Emotions ^d (Pride)	Own positive norm deviations	Support oneself (e.g., in-group favoring pro-environmental behavioral intentions, Harth et al., 2013)
Other-praising Emotions ^{acd} (Elevation, Admiration, Awe, Being Moved, Gratitude, Love)	Others' positive norm deviations	Support the source (e.g., protect nature, Kals et al., 1999; Perkins, 2010; wanting to be part of the protest community, Landmann & Rohmann, 2020)
Other-suffering Emotions ^{ac} (Compassion, Empathy, Emotional Contagion)	Others' Suffering	Help those in need (e.g., victims of environmental destruction, Berenguer, 2010)
Threat-related Emotions ^{bc} (Fear, Anxiety, Hopelessness)	Anticipated negative consequences	Escape (e.g., fleeing from climate change)
Hedonistic Emotions ^c (Joy, Pleasure, Amusement)	(see section 2)	Reinforcement (e.g., enjoying car driving predicts car use, Steg, 2005)

Note. Superscripts indicate whether the emotion type was covered by a) Haidt (2003), b) Böhm and Pfister (2000), c) Kals and Müller (2012), and/or d) Hahnel and Brosch (2018).

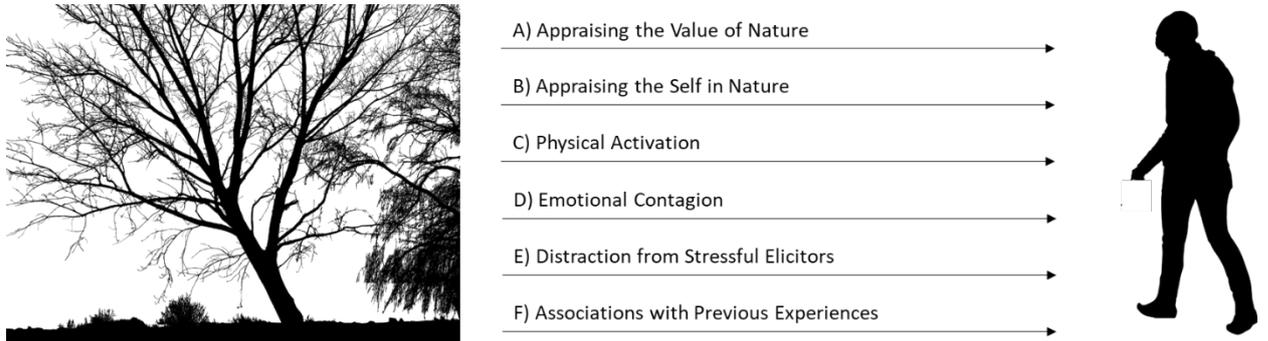


Figure 1. Paths to Emotional Reactions Towards Nature

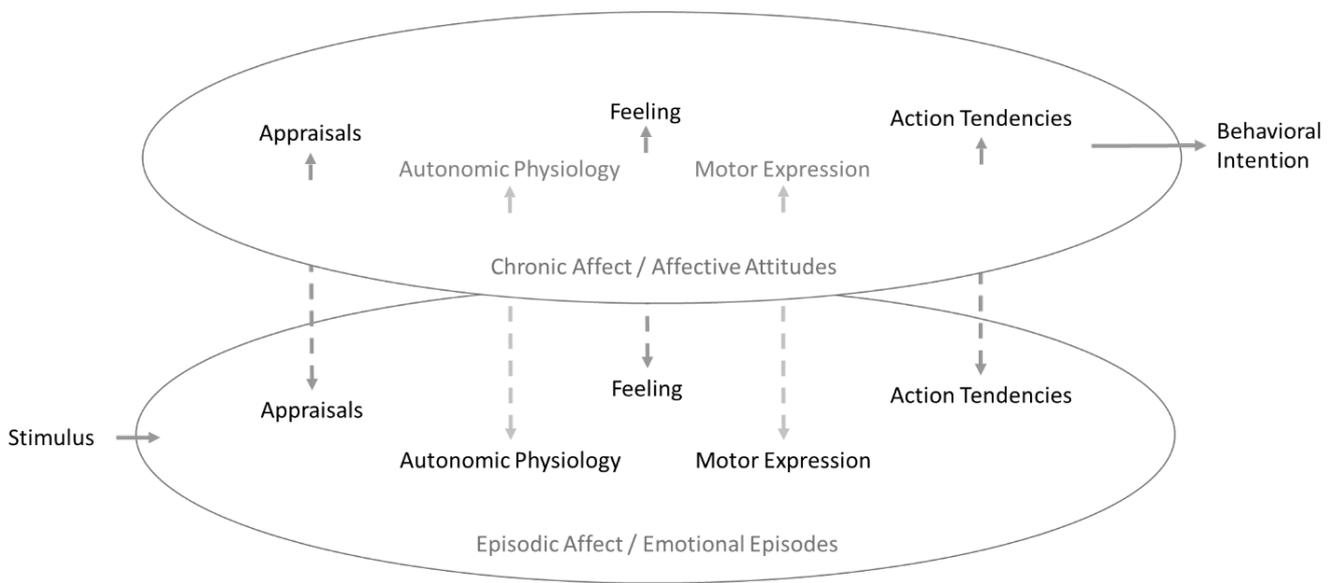


Figure 2. The model of affect generalization is based on Paolini et al. (2006) and Kauff et al. (2017) and extended for different emotion components and behavioral intentions.