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THE MORAL CHARACTERISTICS OF ENVIRONMENTAL SUSTAINABILITY IN YOUNG PEOPLE'S LIVES

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Dealing with the serious environmental problems that threaten present and future of life on earth is one of the biggest challenges for humanity. There is a growing awareness of the detrimental effects of human behaviour on the natural environment (Cook et al., 2013; Evans, 2019). Our actions do not only compromise environmental quality, but jeopardize people's health, particularly among children (Watts et al., 2019). Technological developments can help to ameliorate the burden we put on the planet, but there is no purely technical solution to the current ecological crisis. Nature broadly depends on the degree to which people decide to protect it (Evans, 2019). Hence, intervention strategies to deal with environmental challenges need to promote changes in personal and collective environmental attitudes and behaviours. Pro-environmental behaviors (PEB) refer to actions that contribute to the sustainability of nature (Schultz & Kaiser, 2012). Researchers within the moral development area have highlighted that behaving in a pro-environmental manner qualifies as a form of prosocial-moral action (Matsuba et al., 2020). In many cases (but not all, see e.g., Gifford, 2013), acting in favor of the environment requires individuals to overcome their immediate self-interest for the benefit of future generations (Krettenauer, 2017) and/or the benefit of nature itself. Thus, one way of looking at how people become environmentally responsible is by understanding how individuals develop a sense of environmental morality. Environmental psychologists have long considered PEB a moral issue (Harland et al., 1999; Thøgersen, 2006), and feeling a moral obligation to behave in a pro-environmental way (i.e., personal environmental norm; Schwartz, 1977) predicts PEB in adults (Schultz & Kaiser, 2012) as well as in children (Collado et al., 2019; Matthies et al., 2012). Despite this connection between pro-environmentalism and morality, research on the development of environmental moralization is scarce. As a consequence, very little is known about how children come to develop a moral stance toward the environment and how the moralization of PEB develops in youth.

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Today's children will be the ones dealing with environmental challenges in the future, and most environmental education programs focus on children and youths (van de Wetering et al., 2022). Moreover, from a young age, children can decide to engage in PEB (Pickering et al., 2020) and, at the same time, influence peers and family members to do the same, especially as they reach adolescence and early adulthood (Wallis & Loy, 2021). This makes young populations agents of change, and the study of the development of children's sense of environmental morality a matter of urgency. The main goal of this chapter is to summarize what we currently know about children's and adolescents' morality in relation to environmental issues. We review a number of relevant studies conducted in this area, including our own research, and provide some guidelines on how to instill a moral sense toward the environment from a young age. The reviewed studies include participants with ages ranging from 3 years old until late adolescence. We generally refer to all participants as children and provide specific ages when these are relevant for a better understanding of the research being described.

This chapter is organized into five major sections. First, we describe young populations' moral judgments of environmentally harmful actions and review some variables associated with these. Secondly, we focus on children's and adolescents' personal obligation to protect the environment (i.e., personal norm) and its relation to PEB. We present a theoretical model to explain relations between background variables, personal norm, and PEB. In the third section, we move on to describing children's and adolescents' moral emotions and their associations with PEB. The fourth section reviews how morality towards nature differs across ages. Finally, we focus on how to create a sense of morality towards nature from a young age. In doing so, we review the role of environmental education programs and experience with nature in the development of a moral stance toward nature.

Children's and Adolescents' Moral Judgments of Environmentally Harmful Actions

Children comprehend the concept of *living beings* early in life (around 5 to 6 years of age), and a concept for animals develops even earlier (Waxman, 2005). It is also early in life, even before the acquisition of language, that children show responses to violations of moral principles of care or fairness (Sommerville et al., 2013). Thus, young children have the potential to reason about nature in moral ways (Matsuba et al., 2020). In fact, evidence shows that children as young as 3 years of age take a moral stance toward actions that are harmful to the natural environment (Hahn & Garrett, 2017).

In his pioneering work on children's moral reasoning about environmental issues, Kahn and colleagues (Howe et al., 1996; Kahn, 1997; Kahn & Friedman, 1995; Kahn & Lourenço, 2002) examined children's socio-moral reasoning about environmental pollution and moral judgments in relation to environmental issues. Their studies were based on social domain theory (SDT) as a general framework (Smetana, 2006; Turiel, 2006). According to SDT (Nucci, 1996; Smetana, 2006; Turiel, 2006), from a young age, children's moral reasoning can be categorized into three domains: (1) Moral transgressions (actions that inflict harm on another, physically or psychologically, e.g., pushing another child), (2) Social-conventional transgressions (actions that disrupt the social order, e.g., talking with your mouth full of food) and (3) Non-harmful personal choices (e.g., choosing a friend to play with). It has consistently been found that children judge moral transgressions quite severely, consider social-conventional transgressions as less serious and tend to pass no judgment on personal choices (see Smetana et al., 2014, for a review). In their studies, Kahn and colleagues conducted semi-structured interviews about

children's perceptions of environmental pollution and their moral understanding of how our actions affect nature. Collectively, the age range considered in their studies was wide (from 6 years of age up to college students) and participants came from different backgrounds, such as a deprived community in the USA (Kahn & Friedman, 1995), the amazon jungle (Howe et al., 1996), and Portugal (Kahn & Lourenço, 2002). Their results showed that most children perceive polluting the natural environment as a violation of a moral standard (i.e., it is not okay to pollute even if people are allowed to do it) and, for many children, the reasoning behind this is the intrinsic effect that polluting has on nature's rights and welfare. Overall, their findings showed that children attribute moral features to both nature (particularly animals) and humans and apply moral principles equally to them. Most participants reported that animals were important to them, and many of them believed animals have intrinsic values and tend to extend these beliefs to non-sentient nature (i.e., natural organisms that are not supposed to have any mental life, such as plants). These results were replicated across cultures, suggesting that children's moral reasoning about environmental issues does not depend on their living context.

Also informed by SDT, Hussar and Horvath (2011) examined children's (6-to 10-year olds) judgments of environmentally harmful actions (e.g., failing to recycle) as compared to their assessment of actions included in the three social domains described in social domain theory. For this purpose, children were shown hypothetical situations depicted in a series of drawings and were asked to evaluate actions along the criteria that are commonly used in SDT research (Turiel, 1983). For each hypothetical situation children indicated whether they considered the action to be okay, bad or very bad. Given that the majority of children in Kahn's and colleagues work expressed moral reasoning about pollution, Hussar and Horvath (2011) hypothesized that environmentally harmful actions would be judged as severely as moral transgressions. Their results showed that children judged harm to the environment as morally wrong but, contrary to the authors' expectations, harm to other people was more severely judged than damage to the environment. The authors examined children's justifications for their judgments of environmentally harmful actions. When asked to explain why it is bad to engage in actions generally regarded as moral transgressions (e.g., hitting), children typically focus on the harm and suffering of the victim (Smetana, 2006). Similarly, Hussar and Horvath (2011) found that 74% of participants' explanations considered the moral standing of nature when condemning harmful actions against the environment. In other words, biocentric reasons (e.g., a tree is a living thing) were more frequently mentioned than homocentric ones (e.g., the tree gives us oxygen, and without oxygen we can't breathe).

Hahn and Garrett (2017) expanded the age range used in previous studies and examined preschoolers' moral judgments using the same protocol as Hussar and Horvath (2011). They found that three-year-olds equated environmental harm with harming others and replicated Hussar and Horvath's (2011) findings concerning 4- and 5-year-old children (i.e., environmentally harmful actions were perceived as not as severe as harming people). Pre-schoolers' moral evaluations depended on the type of anti-environmental behaviour conducted, with littering and wasting water being seen as more severe than failing to recycle. Pre-schoolers judged social-conventional transgressions as less severe than moral and environmental transgressions and tended to pass no moral judgment on personal choices, in line with the propositions of SDT and similar to evaluations of primary school children (Hussar & Horvath, 2011).

These series of studies provide support for the claim that PEB is rooted in moral concerns, even for very young children. At the same time, however, this research is limited because while the victims of moral transgressions were clearly specified, the studies' design did not consider

the victim of environmentally harmful actions. This might explain why, from age 4, children did not perceive environmental harm as severe as harming people. SDT proposes that evaluations of harmful actions are influenced by who the victim is (Smetana, 2006) and, as such, the results of the aforementioned studies could have been skewed by the fact that the victim of moral transgressions was specified but the one in environmental transgressions was not. Given that the targets of environmentally harmful actions are diverse, Collado and Sorrel (2019) examined whether children's judgments of environmentally harmful actions depend on the identity of the victim. It is common for children to anthropomorphize natural objects up until about age 12, and to conceive of animals, plants, and trees as moral objects that are alive and can experience pain (Ganea et al., 2014). However, abstract concepts such as ecosystems are more difficult for young children to understand and are not readily anthropomorphized (Gebhard et al., 2003). Considering this finding, Collado and Sorrel (2019) included three types of victims of environmentally harmful actions in their study: First, actions that hurt the environment but have no specific victim (e.g., failing to recycle); second, actions that hurt animals; and third, actions that hurt plants and trees. In addition, they included actions that exemplified the three social domains (i.e., moral transgressions, socio-conventional transgressions, and personal choices). Results showed that children perceived hurting animals as severe, but not as severe as harming another child. Harm to the environment without a specific victim was considered as serious as a social conventional transgression, and hurting plants/trees was seen as the least severe transgression, even less serious than violating a social-conventional norm. As expected, children passed no judgment on personal choices.

These results are in line with earlier reports on children's moral reasoning about different natural elements. Specifically, children's moral reasoning about environmental damage is more sophisticated when the victim is an animal, as compared to other natural elements (Kahn, 2006). The more emotionally connected to the animal a child feels, the more s/he sees it as a moral object (Dunlap, 1989; Kellert, 1984). For instance, Hussar and Harris (2018) evaluated 7- to 12-years-olds' judgments of physical attacks (e.g., kicking) on three different types of animals: pets, farm animals, and wild animals, and compared these actions to how children judged hurting another child. The researchers also checked if children's judgments depended on whether they were vegetarian. Children judged attacks against animals as similar to moral transgressions but showed some sensitivity to the type of animal involved. Harm to pets was perceived as the most severe action, followed by hurting wild animals and hurting farm animals. Hurting another child was considered the less severe behavior, and no differences were found between vegetarians and non-vegetarians. When trying to explain these results, Hussar and Harris (2018) argue that children tend to feel compassion toward vulnerable animals and are particularly sensitive to harmful acts against them as compared to hurting what they perceive as non-vulnerable humans. Even though vegetarian and non-vegetarian children evaluated physical attacks towards animals similarly, they do differ in their perceptions of whether *eating meat* is a moral transgression (Hussar & Harris, 2009). According to Hussar and Harris' (2009) results, 6- to 12-year-old vegetarian children referred to the death or suffering of animals as their reasons to refrain from eating meat, especially if their families were meat-eating. However, for non-vegetarian children the reasons for their abstinence from meat eating were related to taste and health.

More recently, Collado and colleagues (2022) examined another reason explaining why children judge hurting some environmental victims as more serious than hurting others. Based on the idea that animals' aesthetic value influences people's attitudes toward animal conservation (Colléony et al., 2017), Collado and colleagues (2022) investigated whether the attractiveness

of a victim influenced how harshly children assessed hurting such a victim and, as a reference point, compared these evaluations to judgments of harmful actions within the three classical social domains (i.e., moral transgressions, social-conventional transgressions, and personal choices). Attractiveness was understood as the quality of attracting attention, interest, affection, and other pleasurable emotions (Gunnthorsdottir, 2001). Two groups of animals were selected according to how attractive children perceived those animals: Attractive animals (squirrel, bird, butterfly versus unattractive animals (bat, ant, moth). According to the study's findings, attractiveness was related to the moral standing that children granted to animals. Hurting unattractive animals was perceived as less serious than transgressing a social norm, while children condemned harm to attractive animals as much as harming another child.

Children's and Adolescents' Social and Personal Norms as Predictors of PEB

The social world plays an essential role in children's and adolescents' moral view of nature. Social norms represent the perceived social pressure to perform a behavior (Fishbein & Ajzen, 2010) or a person's beliefs about the common/accepted behavior within the group (Cialdini & Trost, 1998). In turn, personal norms refer to a feeling of moral obligation to behave in a certain way (Schwartz, 1977). Moral endorsement of pro-environmental norms is related to adolescents' and young adults' PEB. Endorsement may reflect a social norm, but also a personal norm, in particular when moral emotions evoked by the (scenario) situation apply negatively to the self, like guilt and shame (Krettenauer & Lefebvre, 2021). Other studies find that a sense of personal obligation to protect the environment predicts adults' PEB (Schultz & Kaiser, 2012), such as recycling (Bratt, 1999), using energy-saving light bulbs (Harland et al., 1999), and the use of sustainable travel means (Lind et al., 2015). In fact, the effect of social norms (de Groot et al., 2021), biospheric values and environmental self-identity (van der Werff et al., 2013) on PEB strongly depends on the degree to which these variables affect one's personal environmental norms (but not completely; see e.g., Collado et al., 2019).

The most complete model, in our view, to explain the role of personal norm on behavior has been developed by Schwartz (1977) in his Norm Activation Theory (NAT). NAT states that the activation of personal norms involve "situation-specific reflections of the cognitive and affective implications of a person's values for specific actions" (Schwartz & Howard, 1984, p. 199). In NAT personal norm can be activated by four specific factors, is influenced by norms originating in the social environment and by values, and will lead to behavior, provided a defense mechanism focusing on personal costs does not substantially weaken the strength of the activators (e.g., Schwartz, 1977, p. 241). In Figure 23.1 the model is presented for PEB where the value component is represented as environmental concern, which is here meant to cover general concepts as biospheric values, connection to nature, and self-identity as an environmentally conscious person.

The variables named activators in NAT are the following (see Schwartz & Howard, 1984, or Harland et al., 2007, for an empirical test): *Awareness of need* involves the extent to which a person's attention is focused on the existence of a person or a more abstract entity (e.g., the environment) in need; S*ituational responsibility*, refers to the extent to which a person feels responsible for (the consequences of) that need. When it is, for instance, clear that other people have caused the need, the likelihood that potential actors feel some responsibility in that situation decreases (Schwartz, 1977, p. 246); *Efficacy* relates to the extent to which actions are identified that might alleviate the need; *Ability*, the fourth activator, refers to the actors' perception about the own resources or capabilities required to perform the focal behavior. The literature

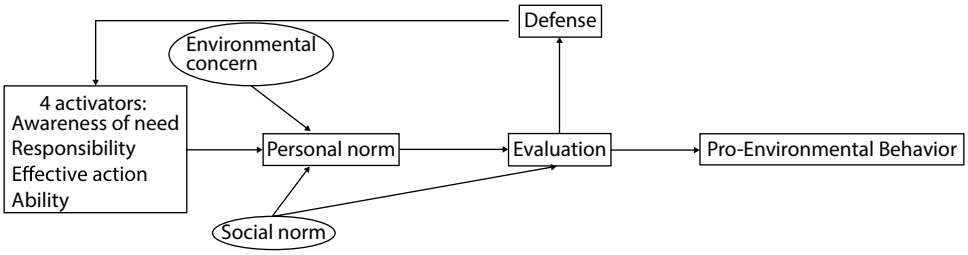

Figure 23.1 Main components and structure of Schwartz' Norm-Activation Theory.

Note. This model has been created by the authors of this chapter based on Schwartz's original model. The original model can be seen in Schwartz (1977).

described below will point out that factors in the model have been researched for children, but mostly in isolation, while the model gives the connections and will also be helpful to identify factors that have not been given attention.

Research of the development and transmission of personal environmental norms in children and adolescents has been scant, but evidence suggests that young populations feel morally obligated to protect the environment and that their immediate social contexts (e.g., parents and significant others) are responsible for the development of personal environmental norms (Chawla & Derr, 2012). As shown in the model, social norms may become internalized (Schwartz & Howard, 1984; Thøgersen, 2006), leading to personal norms which, in turn, predict PEB (Bamberg et al., 2007). Considering children, Matthies and colleagues (2012) conducted a study with 8- to 10-year-olds and found that parental PEB (i.e., parents' descriptive norms) was related to their children's personal environmental norms, together with other variables such as sanctions for behaving in an anti-environmental way. Also, their results showed that personal environmental norms, in turn, predicted PEB. Similarly, Cheng and Monroe (2012) showed that family values toward nature were positively linked to 9- to 10-year-old children's interest in participating in nature-based activities as well as in behaving in environmentally friendly ways. Interestingly, family values were also associated with children's interests in pro-environmental practices through a stronger sense of connection to nature. In other words, family environmental social norms helped children develop empathy for other creatures and a sense of responsibility toward nature.

The relevance of personal environmental norms for PEB has also been demonstrated in samples with adolescents. When trying to explain adolescents' PEB, Grønhoj and Thøgersen (2012) found that family norms explained as much behavioral variance as adolescents' own attitudes. The effect was particularly strong when social norms were manifested in parental behavior. In a later study, Balundè and colleagues (2020) found that personal environmental norms play a relevant role in motivating adolescents' (13- to 19-year-olds) waste prevention behaviors. Besides personal norms, the authors considered several antecedents of behavior, such as social norms, biospheric values and environmental self-identity. Adolescents' sense of moral obligation to behave in environmentally unharmful ways was a strong predictor of reusing shopping bags, giving away or selling unused items and refraining from buying bottled water or packaged goods. Considering social context, personal norms were predicted by adolescents' social pressure to behave in a pro-environmental way. The pivotal role of adolescents' personal environmental norms on PEB was also found in Collado and colleagues (2019). In two consecutive studies, the authors examined whether 12- to 19-year-olds' PEB patterns are associated with relevant others' actions and expectations. Specifically, they checked whether adolescents'

personal environmental norms were related to their parents' and peers' pro-environmentalism, and if personal environmental norms would predict PEB. According to their results, social norms have a direct effect on adolescents' PEB and an indirect one, through personal environmental norms. Similarly, Wallis and Loy (2021) found that personal environmental norms were a strong predictor of youth participation in collective action in favor of the environment. Additional predictors of youth's pro-environmental engagement were their identification with others engaging in PEB and perceiving peers participating in collective action.

The results above support that children and adolescents are receptive to other people's attitudes and behaviors towards nature, and that both parents and peers are key agents that help develop a sense of moral obligation to protect the environment. Mothers appear to have a stronger influence on children's (Matthies et al., 2012) and adolescents' (Collado et al., 2019) personal environmental norms than fathers. Longitudinally, the effects of mothers' environmental attitudes on children's PEB seem to last until early adulthood (Evans et al., 2018). Other social agents, such as teachers and peers, also seem to have a strong impact on children's moral feelings toward nature (Chawla & Derr, 2012), climate change knowledge (Hestness et al., 2019), and evaluations of anti-environmental behaviors as immoral (Pearce et al., 2020). Additional social agents not included in the most immediate circle are likely influencing children's personal environmental norms. For instance, media coverage of environmental issues is related to 6- to 12-year-old children's perceptions of energy consumption and waste (Pearce et al., 2020). However, the effect of media coverage on children's perceptions is less strong than that of parents and teachers. Accessibility to social media increases as children grow up (Bozzola et al., 2022). Whether social media plays a stronger role in the generation of shared environmental norms in adolescents than in younger children is still unknown. The actual effect of media coverage on children's and adolescents' personal environmental norms warrants further research.

Children's and Adolescents' Moral Emotions and PEB

There is consensus among environmental psychologists that emotions play a pivotal role in the way people behave toward the natural world (Taufik, & Venhoeven, 2018). Researchers distinguish two types of emotions within the moral domain that prompt people to behave in a moral way (Krettenauer, 2017; Matsuba et al., 2020). A first type of moral emotions refers to "emotional responses to behaviors that either violate or conform to a moral standard" (Krettenauer, 2017, p. 3). Emotions such as guilt, outrage and pride that require the attribution of responsibility to one or more individuals for complying or omitting morally relevant actions, exemplify this type of moral emotions. A second type of emotions involves moral emotions in a broader sense. These emotions relate to those that prompt people to act in a moral way (e.g., gratitude, sympathy, forgiveness), but might not necessarily be related to moral standards of right or wrong (Krettenauer, 2017).

Focusing on the first type of moral emotions, pride, shame and guilt, among others, are positively associated with adults' PEB. For example, Kaiser (2006) found that moral norms (i.e., personal environmental norms) were positively related to conservation behavior. He also showed that negatively charged self-evaluative moral emotions, such as guilt about not behaving in a pro-environmental way, predicted adults' PEB. Negatively charged moral emotions were also related to PEB when the emotions were evoked by the behavior of others (e.g., anger or outrage when observing others violating a moral norm). For instance, Kals et al. (1999) found that adults' indignation about insufficient nature protection by others was positively linked to PEB.

Moral emotions are associated with prosocial and antisocial behavior in children and adolescents (Malti & Krettenauer, 2013), and might also be among the predictors of children's PEB. Unfortunately, the evidence accumulated in this realm is very scarce. This may be due to the fact that the majority of studies about moral reasoning and environmental moral judgments have been conducted with young children (e.g., Collado & Sorrel, 2019; Hahn & Garret, 2017), and it is not until the age of 7–8 years that children robustly anticipate moral emotions such as guilt when engaging in morally wrong behaviors (Malti & Ongley, 2014). Although scant, there is some evidence supporting that young populations experience moral emotions in relation to environmental issues. Pearce and colleagues (2020) conducted semi-structured interviews with children (aged 6 to 12 years) about their impressions in relation to energy saving behaviors, or lack thereof. All children identified energy waste as an immoral behavior. Most children reported experiencing negative emotions when talking about the consequences of climate change and expressed negative feelings toward people who waste energy. Older children claimed being disappointed in adults who waste energy, and younger ones felt helpless because of the possibility of completely running out of energy and not being able to use it when they grow up.

Environmental issues can also evoke positively charged moral emotions, such as pride for doing what is considered right (positive self-evaluative emotion), or even admiration when observing others complying with a moral norm (positive other-evaluative emotion). Krettenauer (2017) examined the development of environmental moral emotions in early, middle and late adolescents through four types of moral emotions: Negative evaluative emotions (self-, or other-evaluative), and positive evaluative emotions (self- or other-evaluative). According to his results, adolescents granted environmental behaviors a moral stance, but it was contingent on the type of behavior. For example, recycling was perceived as a moral issue by most adolescents, whereas energy conservation was less often considered a matter of morality. His findings also showed that while environmental issues, such as energy consumption or waste reduction, evoked these four types of emotions in adolescents, positive emotions evoked by acting pro-environmentally were stronger than negative emotions evoked by acting in an anti-environmental way. At the same time, self-evaluative emotions were stronger than other-evaluative emotions. In addition, Krettenauer and Lefebvre (2021) found that moral emotions partially mediated the relationship between moral endorsement of pro-environmental norms and PEB.

Considering moral emotions in a broader sense (i.e., second type of emotions), we, as humans, have a basic need and propensity to affiliate with the natural world, often referred to as biophilia (Kellert, 2002; Wilson, 1984). Biophilia can manifest itself in feelings of connection to nature (i.e., connectedness with nature), involving an emotional affiliation toward nature (Chawla, 2020), and a dispositional tendency to understand and share the emotional experience of the natural world (Tam, 2013), among others. Hoffman (2000) argues that the capacity to empathize with other creatures leads to sympathy which, in turn, predisposes individuals to care for others. Similarly, connectedness with nature often predicts PEB in adults (Ives et al., 2018) and children (Chawla & Derr, 2012). For instance, Krettenauer (2017) found that adolescents' emotional affinity toward nature was related to their PEB, and that age-related differences in pro-environmentalism were partly explained by differences in this emotional variable. Considering younger children, Larson and colleagues (2011) found that 6- to 13-year-olds show empathic emotions toward animals (e.g., it makes me sad to see homes built where plants and animals used to be) and a sense of responsibility toward nature (e.g., we need to take better care of plants and animals). In line with these results, 7- to 12-year-old children showed compassionate feelings toward vulnerable animals, and were more eager to

condemn physical attacks toward them if they felt emotionally connected to them (Hussar & Harris, 2018). Extending these results, Collado and colleagues (2015) examined 6- to 12-year-olds' environmental attitudes and behaviors. Emotional affinity toward nature was positively linked to children's PEB, and this relation was stronger for older children. Similarly, Cheng and Monroe (2012) found that 9-to-10-year olds' connectedness to nature was positively linked to their interests in environmentally friendly practices. According to their findings, feelings of empathy for other creatures (e.g., feeling sad when animals are hurt) and a sense of responsibility toward nature (e.g., people do not have the right to change the natural world) are among the emotions more strongly related to children's interests in pro-environmental practices. In a quasi-experimental study with 10-year-olds, Collado and colleagues (2013) found that experiences in nature had a positive effect on children's PEB. This effect was mediated by emotional affinity toward nature and ecological beliefs, although the impact of emotional affinity toward nature was stronger than that of ecological beliefs. This effect was especially significant for more demanding behaviors (e.g., talk to others about the importance of taking actions to protect the environment), supporting the idea that for effortful behaviors a feeling of connection with nature is needed (Müller et al., 2009).

Taken together, the results of these studies suggest that connectedness to nature is a multifaceted emotion (Matsuba et al., 2020) already shown at a very young age (Evans et al., 2018), that can be experienced differently as children grow up (Collado et al., 2015; Krettenauer, 2017) and that is a strong predictor of young populations' PEB (Collado et al., 2013).

Developmental Differences in the Moralization of Nature

Previous studies have demonstrated that the relationship between age and pro-environmentalism is complex (Collado et al., 2015; Evans et al., 2007; Wray-Lake et al., 2016). Even though research examining developmental differences in the moralization of nature and the reasons behind them is still in its infancy, there are some initial studies that shed light on how the moralization of the natural environment develops through the lifespan.

Hahn and Garrett (2017) focused on preschoolers moral judgments of environmentally harmful actions. They found that 3-year-olds equated environmental harm with harming people. However, 4- and 5-year-old children saw harm to humans as more severe than harm to the environment. The authors hypothesize that the reason behind this might be that as children grow up, they assign moral status depending on the identity of the victim and seem to judge actions more severely that harm victims they can more easily relate to (i.e., other children) as compared to harmful environmental actions with no obvious victim (e.g., failing to recycle).

Considering older children, Kahn and Friedman (1995) compared the moralization of natural environments across different grade levels. According to their results, almost 70% of children in grade 2 (7- to 8-year-olds) reasoned about environmental pollution in moral terms. In grade 3 (8-to 9-year olds), it was 91% of the children who took a moral stance toward the natural environment and 100% by grade 5 (10- to 11-year-olds). Given that older children have a more developed cognitive ability to understand environmental issues (Kohlberg, 1984), and a higher capacity to empathize with other creatures beyond the immediate situation (Hoffman, 2000), it seems plausible that the sense of morality toward nature increases as children grow older. In line with these ideas, Collado and Sorrel (2019) found that 7- to 9-year-olds were the ones with a stronger sense of morality towards the environment out of a wide age-range group of children (aged 4 to 12). The authors found that 4- to 6-year-olds

evaluated hurting another child more severely than hurting the environment. The same trends were observed with pre-adolescents (10- to 12-year-olds). However, 7- to 9-year-olds judged hurting animals as harshly as hurting another person, which resembles the tendency found in 3-year-olds (Hahn & Garrett, 2017). Compared to pre-school children and pre-adolescents, 7- to 9-year-olds condemned hurting plants and trees more strongly. Given that the acquisition of morality is socially constructed in interaction with the environment (Smetana, 2006; Turiel, 2006), it seems reasonable to think that, as children grow from early to middle childhood, they show a stronger sense of environmental morality as they have more opportunities to directly experience environmental problems. However, children's moral sense seems to decrease as they approach adolescence (Eames et al., 2018). Supporting this premise, Collado and colleagues (2015) found that younger children (6- to 9-year-olds) are more prone to behave in a pro-environmental way than older children (10- to 12-year-old). Similarly, Collado and Sorrel (2019) reported that pre-adolescents have a weaker moral sense about the environment compared to middle school children, and this tendency seems to last until late adolescence (Krettenauer, 2017).

There are several possible reasons for this drop in PEB during adolescence. One is that perhaps pro-environmental attitudes diminish as children grow up (Collado et al., 2015) and this, in turn, decreases their PEB. Another plausible reason relates to adolescents' personal environmental norms. Children and young people perceive environmental problems as global issues and, as such, allocate the responsibility to look for solutions to the current ecological crisis mainly to governments (Hickman et al., 2021). A lower sense of personal responsibility towards nature, one of the activators of personal norms in NAT (Figure 23.1), might explain the decrease in PEB in adolescents. Emotional connection to nature might also be behind the decreased PEB in teenage years, as it tends to drop during adolescence (Chawla, 2020) together with other moral emotions such as anger and outrage when observing others not engaging in PEB (Krettenauer, 2017). This decline in moral emotions might lead to a weaker commitment with the environment. However, self-evaluative environmental moral emotions, such as pride and guilt when behaving (or not) in a pro-environmental way do not drop in teenage years (Krettenauer, 2017). This might in part counteract declines in PEB over adolescence, especially in collectivistic cultures (Krettenauer et al., 2020).

The developmental shifts in PEB during adolescence could also be explained by the barriers to acting in a pro-environmental way related to life-stage. For instance, adolescents may not have sufficient resources to carry out certain environmental actions (the "ability" activator in NAT). They may also feel that environmental problems are global and, as such, the responsibility to act in favor of nature should be with the governments (Hickman et al., 2021). Thus, developmental trends in PEB may be mediated by opportunity to engage in a desired action or a decrease in responsibility.

It could also be that older children and adolescents consider their daily conservation actions ineffectual (last of the four activators in NAT). The belief of whether one's actions (e.g., recycling) lead to the desirable environmental outcome (i.e., outcome efficacy) predicts children's PEB (Collado & Evans, 2019). Given the complexity of environmental problems, adolescents might be more motivated to engage in collective action, which is generally perceived as having a stronger impact on the environment (Wallis & Loy, 2021). Future research might examine this issue by including potential mediating variables between age and PEB, such as individual and collective self-efficacy, moral emotions and immediate and global social norms. Longitudinal studies are needed in order to obtain a more accurate and less speculative idea of how the moralization of the natural world changes throughout the lifespan.

Environmental Education and the Role of Nature Experience in the Moralization of the Natural World

One common way of instilling a moral stance toward nature is through environmental education (EE). A recent meta-analysis (van de Wetering et al., 2022) found that participation in EE programs improves children and adolescents' environmental knowledge, attitudes, intentions, and behavior. Considering environmental morality, there have been a few EE attempts to influence how children judge environmentally harmful actions. For example, Hahn and Garret (2017) experimentally tested whether preschoolers' moral evaluations of environmentally harmful actions could be influenced using a perspective-taking task. Children were asked to take the perspective of a book character who was the victim of environmental harm or the perspective of a perpetrator of environmentally harmful actions. According to their results, children who took the perspective of the victim rated environmentally irresponsible behaviors more severely than children who took the perspective of a character who caused environmental damage. These findings support the premise that perspective-taking and shared feelings are two important elements of individuals' moral development (Smetana, 2006), and perspective-taking seems like an effective tool to enhance environmental morality in children. They are also in line with researchers who encourage the use of anthropomorphism as a conservation tool (Root-Bernstein et al., 2013; Tam et al., 2013). Anthropomorphism helps children take the perspective of non-human living beings, show empathic feelings toward the natural world, feel more connected to animals and grant them the capacity to suffer and feel pain (Ganea et al., 2014; Gebhard et al., 2003). These affective reactions are linked to children's moral evaluations (Smetana, 2006) and, in fact, anthropomorphized animals tend to be perceived as moral objects (Ganea et al., 2014). The creation of anthropomorphic meaning around plants/trees, and less attractive animal species might be a good way of instilling a moral view towards natural elements that are generally granted a lower moral stand.

In a more recent study, Collado and colleagues (2022) evaluated whether the attractiveness with which primary school children (aged 9–10) perceive different animals and the severity with which they judge hurting them can be influenced by participation in an EE intervention. As indicated earlier, less attractive animals tend to elicit lower preference and more disgust and even fear among children (Ballouard et al., 2012), and this, in turn, is related to granting them a lower moral status as compared to more appealing species. These negative attitudes toward some animals are affected by children's biological illiteracy (Borgi & Cirulli, 2015), and getting to know animals better helps develop a sense of empathy toward them and shift children's attitudes toward less charismatic animals (e.g., snakes) from negative to more positive ones (Ballouard et al., 2012). Thus, Collado and colleagues (2022) EE intervention focused on providing children with knowledge about the less attractive animals. As such, children attended three, 50-minute-long EE sessions in which they learnt about how animals behave and react toward different situations, their habitats, and their relationship with other animals as well as with humans. Their results showed that participants in the EE program rated unattractive animals as more attractive after the intervention (as compared to before), and this led to judging harming animals more severely than before the intervention. Even though children's moral judgments about actions that harm animals do not necessarily lead to the development of personal norms that would guide their actual behavior, gaining environmental knowledge about different natural elements and developing a sense of morality toward nature is a first step toward PEB. Together, the results of these studies with preschoolers and primary school children provide evidence that children's moral judgments in relation to the environment can be shaped through participation in EE programs.

One key factor that has been seen to lead to pro-environmentalism in children is positive experiences in nature, both formal (via EE programs) and informal (e.g., nature near home). Childhood experiences in nature are linked to more positive environmental attitudes (Hahn, 2021; Evans et al., 2007), enhanced appreciation of the beauty of nature and other positive characteristics (Müller et al., 2009), and enhanced opportunities for self-directed exploration and learning about the environment (Chawla & Derr, 2012), among others. Of particular interest to this chapter, time spent in natural areas as a child is concurrently associated with increased connectedness with nature (Chawla, 2020) and stronger empathy toward animals (Cheng & Monroe, 2012), the development of environmental ethics (Kahn, 2006), and an increased sense of morality towards natural elements (Collado & Sorrel, 2019).

Based on SDT, Collado and Sorrel (2019) examined the link between time spent in nature and children's moral judgments of environmentally harmful actions. According to this theory, children's moral development emerges through social interactions, including children's own direct experiences of the consequences of their actions as well as the responses from others to those actions (Smetana, 2006). In line with this theory, Kahn (2006, 2022) argues that through interactions with nature, children develop empathy and concepts of reciprocity and otherness. Children with more frequent interaction with the victim of the transgression develop a faster and/or stronger sense of morality than those with fewer opportunities for interaction (Smetana, 2006). Following this line of thought, children whose contact with nature is more frequent may have more opportunities to interact with the victims of environmental transgressions. This, in turn, could lead to a stronger sense of morality about nature. Collado and Sorrel's (2019) findings support this rationale. They found that children who have frequent contact with nature believe that hurting animals, plants, and trees is a severe action, as compared to children whose contact with nature is scarce. Even hurting the environment, without specifying a victim (e.g., failing to recycle) is perceived as quite serious for children with frequent exposure to nature. However, those with low exposure to nature report that breaking a social norm as worse than actions that harm the environment. These results might reflect that children with more exposure to nature have had more opportunities to experience the consequences of transgressions to animals and the environment than children whose exposure to nature is low. These findings are in line with Kahn's (2022) proposition that daily contact with nature is associated with a stronger sense of morality towards sentient and non-sentient nature. According to Evans and colleagues' (2018) longitudinal study, the positive effects of childhood experiences in nature on pro-environmentalism last through early adulthood, and the impact of nature experiences is independent of other factors such as maternal environmental attitudes.

Opportunities for nature experiences also come formally through EE interventions. While most EE programs focus on improving environmental knowledge, knowledge as such seems to be relatively unimportant when predicting PEB (van de Wetering et al., 2022), and the effectiveness of EE interventions comes from an increased sense of connectedness to nature participants feel after nature-based EE programs (Otto & Pensini, 2017). While knowledge can generally be taught both inside and outside a classroom, an emotional connection to nature is more difficult to acquire indoors, and the inclusion of direct contact with nature as part of EE interventions has been advocated (Jordan & Chawla, 2019). There are some studies showing the relevance of direct contact with nature (through EE program) to nourish a sense of connectedness with nature. For example, schoolchildren showed stronger sympathy towards snakes and expressed the need to protect them more frequently after a field trip involving direct snake catching and manipulation than before the trip (Ballouard et al., 2020). Collado and colleagues (2013) found that spending two weeks in a summer camp in nature enhanced children's

emotional affinity toward nature. This enhanced emotional connection with the natural world led to a stronger willingness to protect the environment. In line with the results of this study, Evans and colleagues (2007) found that young children's sympathy for nature increased after attending a one week outdoor nature education program. Similarly, Otto and Pensini (2017) reported that nature-based EE programs are related to greater environmental knowledge and connectedness to nature in 9- to 12-year-olds, which, in turn, predicts PEB. The results of this study also showed that connectedness to nature explained almost 70% of PEB, while environmental knowledge explained just 2%.

Overall, research findings indicate that EE programs aimed at instilling a sense of environmental morality greatly benefit from experiences in direct contact with nature. Thus, frequent contact with nature should be considered as an effective tool to enhance pro-environmentalism during childhood (Chawla, 2020), and its effects appear to last through early adulthood (Evans et al., 2018). Caution should be taken to ensure that experiences in nature are positive, recreational and/or educational, avoiding those experiences that might relate to children's daily obligations in natural settings, such as helping their parents in agricultural activities (Collado et al., 2016). Besides encouraging a reconnection of children and adolescents with the natural world, especially through EE programs, we also recommend that EE interventions are tailored to the age group they are aimed at. As described earlier, young children and adolescents show a weaker sense of morality in relation to environmental issues compared to primary school children. Thus, extra care should be taken when tailoring EE interventions to these age groups, aiming at preventing the decrease in pro-environmentalism in adolescence.

Conclusion

Pro-environmental behavior is an expression of a moral stance toward protecting the natural environment (Kaiser, 2006; Thøgersen, 2006). Given the current ecological crisis, understanding the development of environmental morality is relevant for both scientific reasons and practical purposes. Research shows that individuals who believe that nature has a moral status tend to behave in a more pro-environmental way. As reviewed earlier, moralization of nature develops early in life (Hahn & Garret, 2017), independently from children's socioeconomic and cultural background (Kahn, 2006). Yet, factors such as exposure to nature (Collado & Sorrel, 2019), social context (Matthies et al., 2012), age (Krettenauer, 2017), and the target of the action (Hussar & Harris, 2018) regulate children's and adolescents' moral perceptions of the natural world. Nature experiences, formally and informally provided, constitute formative pathways towards environmentalism in children and adolescents. A deeper understanding of how environmental morality develops is needed to find efficient means of nourishing a moral stance toward nature in young populations. Stronger collaborations between researchers and educators will most certainly translate into more effective interventions and, ultimately, into a next generation of environmentally less compromised citizens.

References

Ballouard, J.-M., Conord, M., Johany, A., Jarde, N., Caron, S., Deleuze, S., & Bonnet, X. (2020). Is popularity a double-edged sword? Children want to protect but also harvest tortoises. *The Journal of Environmental Education*, *51*(5), 347–360.

Balundè, A., Jovarauskaite, L., & Poskus, M. S. (2020). Exploring adolescents' waste prevention via value-identity-personal norm and comprehensive action determination models. *Journal of Environmental Psychology*, *72*, 101526.

Bamberg, S., Hunecke, M., & Blöbaum, A. (2007). Social context, personal norms and the use of public transportation: Two field studies. *Journal of Environmental Psychology*, *27*, 190–203.
Borgi, M., & Cirulli, F. (2015). Attitudes toward animals among kindergarten children: Species preferences. *Anthrozoös: A Multidisciplinary Journal of the Interactions of People and Animals*, *28*(1), 45–59.
Bozzola, E., Spina, G., Agostiniani, R., Barni, S., Russo, R., Scarpato, E., Di Mauro, A., Di Stefano, A. V., Caruso, C., Corsello, G., & Staiano, A. (2022). The use of social media in children and adolescents: Scoping review on the potential risks. *International Journal of Environmental Research and Public Health*, *19*, 9960.
Bratt, C. (1999). The impact of norms and assumed consequences on recycling behavior. *Environment and Behavior*, *31*, 630–656.
Chawla, L. (2020). Childhood nature connection and constructive hope: A review of research on connecting with nature and coping with environmental loss. *People and Nature*, *2*(3), 619–642.
Chawla, L., & Derr, V. (2012). The development of conservation behaviors in childhood and youth. In S. D. Clayton (Ed.), *The Oxford handbook of environmental and conservation psychology* (pp. 527–555). Oxford University Press.
Cheng, J. C., & Monroe, M. C. (2012). Connection to nature: Children's affective attitude toward nature. *Environment and Behavior*, *44*, 31–49.
Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity, and compliance. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (4th ed., Vol. 2, pp. 151–192). McGraw-Hill.
Collado, S., & Evans, G. W. (2019). Outcome expectancy: A key factor to understanding childhood exposure to nature and children's pro-environmental behavior. *Journal of Environmental Psychology*, *61*, 30–36. https://doi.org/10.1016/j.jenvp.2018.12.001
Collado, S., Evans, G. W., Corraliza, J. A., & Sorrel, M. A. (2015). The role played by age on children's pro-ecological behaviors: An exploratory analysis. *Journal of Environmental Psychology*, *44*, 85–94.
Collado, S., Rodríguez-Rey, R., & Sorrel, M. A. (2022). Does beauty matter? The effect of perceived attractiveness on children's moral judgments of harmful actions against animals. *Environment and Behavior*, *54*, 247–275.
Collado, S., & Sorrel, M. A. (2019). Children's environmental moral judgments: Variations according to type of victim and exposure to nature. *Journal of Environmental Psychology*, *62*, 42–48.
Collado, S., Staats, H., & Corraliza, J. A. (2013). Experiencing nature in children's summer camps: Affective, cognitive and behavioural consequences. *Journal of Environmental Psychology*, *33*, 37–44.
Collado, S., Staats, H., & Sancho, P. (2019). Normative influences on adolescents' self-reported pro-environmental behaviors: The role of parents and friends. *Environment and Behavior*, *51*, 288–314.
Colléony, A., Clayton, S., Couvet, D., Jalme, M. S., & Prevot, A. (2017). Human preferences for species conservation: Animal charisma trumps endangered status. *Biological Conservation*, *206*, 263–269.
Cook, J., Nuccitelli, D., Green, S. A., Richardson, M., Winkler, B., Painting, R., Winkler, B., Painting, R., Way, R., Jacobs, P., & Skuce, A. (2013). Quantifying the consensus on anthropogenic global warming in the scientific literature. *Environmental Research Letters*, *8*(2), 024024.
De Groot, J. I. M., Bondy, K., & Schuitema, G. (2021). Listen to others or yourself? The role of personal norms on the effectiveness of social norm interventions to change pro-environmental behavior. *Journal of Environmental Psychology*, *78*, 101688.
Dunlap, J. J. (1989). Moral reasoning about animal treatment. *Anthrozoös*, *2*(4), 245–258.
Eames, C., Barker, M., & Scarff, C. (2018). Priorities, identity and the environment: Negotiating the early teenage years. *Journal of Environmental Education*, *49*, 189–206.
Evans, G. W. (2019). Projected behavioral impacts of global climate change. *Annual Review of Psychology*, *70*, 449–474. https://doi.org/10.1146/annurev-psych-010418-103023.
Evans, G. W., Brauchle, G., Haq, A., Stecker, R., Wong, K., & Shapiro, E. (2007). Young children's environmental attitudes and behaviors. *Environment and Behavior*, *39*, 635–659.
Evans, G. W., Otto, S., & Kaiser, F. G. (2018). Childhood origins of young adult environmental behavior. *Psychological Science*, *29*(5), 679–687.
Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach.* Psychology Press.
Ganea, P., Canfield, C., Simons-Ghafari, K., & Chou, T. (2014). Do cavies talk? The effect of anthropomorphic picture books on children knowledge about animals. *Frontiers in Psychology.*

Gebhard, U., Nevers, P., & Billmann-Mahecha, E. (2003). Moralizing trees: Anthropomorphism and identity in children's relationship to nature. In S. Clayton & S. Opotow (Eds.), *Identity and the natural environment* (pp. 91–111). MIT Press.
Gifford, R. (2013). Dragons, mules, and honeybees: Barriers, carriers and unwitting enablers of climate change action. *Bulletin of the Atomic Scientists*, *69*, 41–48.
Grønhøj, A., & Thøgersen, J. (2012). Action speaks louder than words: The effect of personal attitudes and family norms on adolescents' pro-environmental behaviour. *Journal of Economic Psychology*, *33*(1), 292–302. https://doi.org/10.1016/j.joep.2011.10.001
Gunnthorsdottir, A. H. (2001). Physical attractiveness of an animal species as a decision factor for its preservation. *Anthrozoös*, *14*(4), 204–215.
Hahn, E. R., & Garrett, M. K. (2017). Preschoolers' moral judgments of environmental harm and the influence of perspective taking. *Journal of Environmental Psychology*, *53*, 14–19.
Harland, P., Staats, H., & Wilke, H. A. M. (1999). Explaining pro-environmental intention and behavior by personal norms and the theory of planned behavior. *Journal of Applied Social Psychology*, *29*, 2505–2528.
Harland, P., Staats, H., & Wilke, H. A. M. (2007). Situational and personality factors as direct or personal norm mediated predictors of pro-environmental behavior: Questions derived from norm-activation theory. *Basic and Applied Social Psychology*, *29*, 323–334.
Hestness, E., McGinnis, R., & Breslyn, W. (2019). Examining the relationship between middle school students' sociocultural participation and their ideas about climate change. *Environmental Education Research*, *25*, 912–924.
Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E., Wray, B., Mellor, C., & van Susteren, L. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: A global survey. *The Lancet Planetary Health*, *5*, E863–E873.
Hoffman, M. L. (2000). *Empathy and moral development: Implications for caring and justice*. Cambridge University Press.
Howe, D., Kahn, P. H., & Friedman, B. (1996). Along the Rio Negro: Brazilian children's environmental views and values. *Developmental Psychology*, *32*, 979–987.
Hussar, K. M., & Harris, P. L. (2009). Children who choose not to eat meat: A study of early moral decision-making. *Social Development*, *19*, 627–641.
Hussar, K. M., & Harris, P. L. (2018). Vegetarian and nonvegetarian children's judgments of harm to animals and humans. *Ecopsychology*, *10*(1), 36–43.
Hussar, K. M., & Horvath, J. C. (2011). Do children play fair with mother nature? Understanding children's judgments of environmentally harmful actions. *Journal of Environmental Psychology*, *31*, 309–313.
Ives, C. D., Abson, D. J., von Wehrden, H., Dorninger, C., Klaniecki, K., & Fisher, J. (2018). Reconnecting with nature for sustainability. *Sustainability Science*, *13*, 1389–1397.
Jordan, C., & Chawla, L. (2019). A coordinated research agenda for nature-based learning. *Frontiers in Psychology*, *10*(MAR), 1–10. https://doi.org/10.3389/fpsyg.2019.00766
Kahn, P. H. (1997). Children's moral and ecological reasoning about the Prince William Sound oil spill. *Developmental Psychology*, *33*, 1091–1096.
Kahn, P. H. (2006). Nature and moral development. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 461–480). Lawrence Erlbaum Associates.
Kahn, P. H. (2022). In relationship with nature: Development and interaction. *Journal of Moral Education*, *51*, 73–91.
Kahn, P. H., & Friedman, B. (1995). Environmental views and values of children in an inner-city black community. *Child Development*, *66*, 1403–1417.
Kahn, P. H., & Lourenço, O. (2002). Water, air, fire and earth: A developmental study in Portugal of environmental moral reasoning. *Environment and Behavior*, *34*, 405–430.
Kaiser, F. G. (2006). A moral extension of the theory of planned behavior: Norms and anticipated feelings of regret in conservationism. *Personality and Individual Differences*, *41*, 71–81.
Kals, E., Schumacher, D., & Montada, L. (1999). Emotional affinity toward nature as a motivational basis to protect nature. *Environment and Behavior*, *31*(2), 178–202.
Kellert, S. R. (1984). Attitudes toward animals: Age-related development among children. In M. W. Fox & L. D. Mickely (Eds.), *Advances in animal welfare science 1984/85* (pp. 43–60). The Humane Society of the United States.

Kellert, S. R. (2002). Experiencing nature: Affective, cognitive, and evaluative development in children. In P. H. Kahn & S. R. Kellert (Eds.), *Children and nature: Psychological, sociocultural, and evolutionary investigations* (pp. 116–149). MIT Press.

Kohlberg, L. (1984). *The psychology of moral development: Moral stages and the idea of justice*. Harper and Row.

Krettenauer, T. (2017). Pro-environmental behaviour and adolescent moral development. *Journal of Research on Adolescence*, *27*, 581–693.

Krettenauer, T., & Lefebvre, J. P. (2021). Beyond *subjective* and *personal*: Endorsing pro-environmental norms as moral norms. *Journal of Environmental Psychology*, *76*, 101644.

Krettenauer, T., Wang, W., Jia, F., & Yao, Y. (2020). Connectedness with nature and the decline of pro-environmental behavior in adolescence: A comparison of Canada and China. *Journal of Environmental Psychology*, *71*, 101348. https://doi.org/10.1016/j.jenvp.2019.101348

Larson, L. R., Green, G. T., & Castleberry, S. B. (2011). Construction and validations of an instrument to measure environmental orientations in a diverse group of children. *Environment and Behavior*, *43*, 72–89.

Lind, H. B., Nordfjærn, T., Jørgensen, S. H., & Rundmo, T. (2015). The value-belief-norm theory, personal norms and sustainable travel mode choice in urban areas. *Journal of Environmental Psychology*, *44*, 119–125.

Malti, T., & Krettenauer, T. (2013). The relation of moral emotion attributions to prosocial and antisocial behavior: A meta-analysis. *Child Development*, *84*, 397–412.

Malti, T., & Ongley, S. F. (2014). The development of moral emotions and moral reasoning. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 163–183). Psychology Press.

Matsuba, M. K., Krettenauer, T., & Pratt, M. W. (2020). The development of pro-environmentalism in context. In L. A. Jensen (Ed.), *The Oxford handbook of moral development: An interdisciplinary perspective* (pp. 419–439). Oxford Academic.

Matthies, E., Selge, S., & Klockner, C. (2012). The role of parental behavior for the development of behavior specific environmental norms: The example of recycling and re-use behavior. *Journal of Environmental Psychology*, *32*, 277–284.

Müller, K. M., Kals, E., & Pansa, R. (2009). Adolescents' emotional affinity toward nature: A cross-societal study. *Journal of Developmental Processes*, *4*, 59–69.

Nucci, L. (1996). Morality and personal freedom. In E. S. Reed, E. Turiel, & T. Brown (Eds.), *Values and knowledge* (pp. 41–60). Lawrence Erlbaum Associates.

Otto, S., & Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global Environmental Change*, *47*, 88–94.

Pearce, H., Hudders, L., & Van de Sompel, D. (2020). Young energy savers: Exploring the role of parents, peers, media and schools in saving energy among children in Belgium. *Energy Research & Social Science*, *63*, 101392.

Pickering, G. J., Schoen, K., Botta, M., & Fazio, X. (2020). Exploration of youth knowledge and perceptions of individual-level climate mitigation action. *Environmental Research Letters*, *15*(10), 104080.

Root-Bernstein, M., Douglas, L. R., & Verissimo, D. (2013). Anthropomorphized species as tools for conservation: Utility beyond prosocial, intelligent and suffering species. *Biodiversity and Conservation*, *22*(8), 1577–1589.

Schultz, P. W., & Kaiser, F. (2012). Promoting pro-environmental behavior. In S. Clayton (Ed.), *The Oxford handbook of environmental and conservation psychology* (pp. 556–580). Oxford University Press.

Schwartz, S. H. (1977). Normative influences on altruism. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10, pp. 221–279). Academic Press.

Schwartz, S. H., & Howard, J. A. (1984). Internalized values as motivators of altruism. In E. Staub, D. Bar-Tal, J. Karylowski, & J. Reykowski (Eds.), *Development and maintenance of prosocial behavior* (pp. 229–255). Plenum.

Smetana, J. (2006). Social domain theory: Consistencies and variations in children's moral and social judgments. In M. Killen, & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 119–154). Erlbaum.

Smetana, J., Jambon, M., & Ball, C. (2014). The social domain approach to children's moral and social judgments. In M. Killen & J. G. Smetana (Eds.), *Handbook of moral development* (2nd ed., pp. 23–45). Psychology Press.

Sommerville, J. A., Schmidt, M. F. H., Yun, J. E., & Burns, M. (2013). The development of fairness expectations and prosocial behavior in the second year of life. *Infancy*, *18*, 40–66.
Tam, K. P. (2013). Dispositional empathy with nature. *Journal of Environmental Psychology*, *35*, 92–104.
Tam, K. P., Lee, S. L., & Chao, M. M. (2013). Saving Mr. Nature: Anthropomorphism enhances connectedness to and protectiveness toward nature. *Journal of Experiential Social Psychology*, *49*(3), 514–521.
Taufik, D., & Venhoeven, L. (2018). Emotions and pro-environmental behavior. In L. Steg & J. I. M. de Groot (Eds.), *Environmental psychology: An introduction* (2nd ed., pp. 189–197). Wiley-Blackwell.
Thøgersen, J. (2006). Norms for environmentally responsible behavior: An extended taxonomy. *Journal of Environmental Psychology, 26*, 247–261.
Turiel, E. (1983). *The development of social knowledge*. Cambridge University Press.
Turiel, E. (2006). The development of morality. In N. Eisenberg (Vol. Ed.), *Handbook of child psychology* (Vol. 3, pp. 789–857). Wiley.
van de Wetering, J., Leijten, P., Spitzer, J., & Thomaes, S. (2022). Does environmental education benefit environmental outcomes in children and adolescents? A meta-analysis. *Journal of Environmental Psychology*, *81*, 101782.
van der Werff, E., Steg, L., & Keizer, K. (2013). It is a moral issue: The relationship between environmental self-identity, obligation-based intrinsic motivation and pro-environmental behavior. *Global Environmental Change, 23*, 1258–1265.
Wallis, H., & Loy, L. S. (2021). What drives pro-environmental activism of young people? A survey study on the Fridays for future movement. *Journal of Environmental Psychology*, *74*, 101581.
Watts, N., Amann, M., Arnell, N., Ayeb-Karlsson, S., Belesova, K., Boykoff, M., Byass, P., Cai, W., Campbell-Lendrum, D., Capstick, S., Chambers, J., Dalin, C., Daly, M., Dansandi, N., Davies, M., Drummond, P., Dubrow, R., Ebi, K., Eckelman . . . Montgomery, H. (2019). The 2019 report of The Lancet Countdown on health and climate change: Ensuring that the health of a child born today is not defined by a changing climate. *The Lancet*, *394*(10211), 1836–1878.
Waxman, S. (2005). Why is the concept "living thing so elusive? Concepts, languages, and the development of folkbiology. In W. K. Ahn (Ed.), *Categorization inside and outside the laboratory: Essays in Honor of Douglas L Medin* (pp. 49–67). American Psychological Association.
Wilson, E. O. (1984). *Biophilia*. Harvard University Press.
Wray-Lake, L., Syvertsen, A. K., & Flanagan, C. A. (2016). Developmental change in social responsibility during adolescence: An ecological perspective. *Developmental Psychology*, *52*, 130–142.