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Understanding Proenvironmental Behavior: A Model Based on Moral Identity and Connection to Nature

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ABSTRACT

Research has widely recognized the role of personal norms, connection to nature, and different forms of identity as important factors that promote individuals' environmental actions, as well as the role of moral disengagement to diminish these. However, less attention has been given to one's *moral identity* as a key driver for proenvironmental behavior. Extending current literature, we therefore explored if moral identity could promote proenvironmental behavior. Participants in our study ($N = 359$) completed a series of questionnaires. Correlational analyses, path analysis, mediation analysis, and moderation analysis, where relevant, were used in testing four possible models. Only the model in which moral identity and connection to nature predicted proenvironmental behavior directly, and indirectly through the effect of personal norms and moral disengagement, showed good fit indices. Our findings highlight the multifaceted nature of proenvironmental engagement, in which a sense of moral obligation to act sustainably could facilitate behavior stemming from moral identity and the feeling of being connected to nature.

1 | Introduction

Environmental issues are becoming increasingly serious at a global level. Much of humanity's behavior is not sustainable in the long run (Allen et al. 2018; IPCC 2022). Hence, there is an urgent and growing need to better understand the mechanisms that can help people to adopt more sustainable behaviors toward the environment. However, because costs usually are more prevalent than benefits, promoting proenvironmental behavior is notoriously complicated (e.g., Harland et al. 2007; Vlek and Keren 1992). Acting environmentally friendly oftentimes requires sacrificing personal interests for the collective good. Then why are people still willing to display such behavior?

Over the past few decades, several theoretical frameworks have emerged to explain the antecedents of proenvironmental

behavior. These models have evolved from early economic or rational-choice models, which focused primarily on costs and benefits, to more complex models that integrate psychological, social, and moral dimensions. The theory of planned behavior (TPB; Ajzen 1991) has been one of the most influential models in this area. It posits that intentions to engage in a behavior are shaped by three factors: attitudes, subjective norms, and perceived behavioral control. This model emphasizes the rational decision-making process where individuals weigh the potential benefits and costs of their actions. However, the TPB has been critiqued for not fully capturing the complexity of human behavior in the context of environmental issues.

While this model explains many types of human behavior, it does not address the moral and emotional dimensions that are crucial when considering behaviors that require sacrifices for the collective good, such as environmental conservation

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(Harland et al. 2007; Vlek and Keren 1992). For instance, proenvironmental behavior often involves personal costs—whether in terms of money, time, or convenience—requiring individuals to prioritize collective well-being over self-interest. This complexity has led to a broader understanding of the motivational factors that underlie proenvironmental behavior. In this broader context, value-based theories like the value-belief-norm theory (VBN; Stern 2000) and the norm activation theory (NAT; Schwartz 1977) have been developed. These theories place a stronger emphasis on personal norms—the internalized sense of obligation to perform certain behaviors because they are deemed morally right. According to these models, individuals are more likely to engage in proenvironmental behaviors when they believe that these actions align with their personal values and moral beliefs. This line of research has demonstrated that environmental concern is often linked to a sense of moral duty, particularly when individuals feel a strong sense of responsibility toward future generations or other living beings (Stern 2000).

More recently, the self-determination theory (SDT; Deci and Ryan 2008) has provided a framework for understanding the intrinsic and extrinsic motivations that drive sustainable behaviors. According to SDT, behaviors are more likely to be sustained when they are intrinsically motivated—that is, when individuals engage in actions because they find them personally fulfilling or because they align with their core values. This framework complements earlier theories by integrating the idea that motivation is not solely based on external rewards or penalties but is also influenced by the internal psychological need for autonomy, competence, and relatedness.

In addition to these theoretical frameworks, research on emotional and affective responses has emphasized the role of connection to nature—the extent to which individuals feel emotionally bonded to the natural world (Kals et al. 1999; Mayer and Frantz 2004; Perkins 2010). Individuals with a strong sense of connection to nature tend to experience more intense emotional responses to environmental issues and are more likely to engage in behaviors that protect or enhance the environment (Schultz 2001; Ibáñez-Rueda et al. 2020; Whitburn et al. 2020).

Despite the valuable insights provided by these theories, one significant gap in the literature is the integration of moral identity—the degree to which being moral is central to one's self-concept—into the understanding of proenvironmental behavior (Van der Werff et al. 2013). Moral identity may be a key factor that may influence the activation of personal norms. When individuals see themselves as moral or ethical beings, they are more likely to act in ways that align with their moral beliefs, even when doing so requires personal sacrifice. This idea is consistent with findings in moral domain, which suggest that moral identity can serve as a powerful motivator for proenvironmental behavior (Aquino and Reed 2002; Jia et al. 2017).

In light of this broader research landscape, the present study aims to explore how moral identity and connection to nature jointly influence proenvironmental behavior, from a moral perspective, also taking into account other mechanisms that

intervene in directing behavior in the moral domain, such as moral disengagement and personal norms.

1.1 | The Environment as a Moral Domain

Although not always on the surface, people often feel a moral obligation to act in proenvironmental ways (e.g., De Groot and Steg 2008; Harland et al. 2007; Thøgersen 1996). This happens from an early age: even young children consider the protection of the natural environment a moral obligation (Kahn 2006; Krettenauer 2017). Given that the decision to act responsibly often involves a trade-off between self-interest and the well-being of others (Kaiser 2006), morality-based proenvironmental behavior can be explained from a decision-making perspective. Proenvironmental behavior typically requires individuals to incur personal costs—whether financial, temporal, or in terms of convenience—for the benefit of the collective good (Hertz and Krettenauer 2016). Such decisions are guided by personal values, moral norms, and moral judgment (Jia et al. 2017).

When considering environmental issues as a moral issue, we specifically refer to NAT (Schwartz 1977). This theory contains a complex model of human decision-making in moral situations (Schwartz 1977; Schwartz and Howard 1984), and has been successfully extended to prosocial and proenvironmental behavior (see Harland et al. 2007). The core of this theory is personal norms that promote proenvironmental actions when activated. Following NAT, we will consistently use the term *personal norms* (Schwartz 1977; Schwartz and Howard 1984); other studies also use *moral norms* (e.g., De Leeuw et al. 2015; Turaga et al. 2010).

However, the mere presence of moral beliefs does not always lead to consistent behavioral engagement. Indeed, individuals who express environmental concern or hold strong biospheric values do not always act accordingly—a phenomenon known as the value–action gap. One mechanism that may help explain this gap is moral disengagement, a set of cognitive strategies that allow individuals to disconnect their moral standards from their actions, thereby avoiding feelings of guilt or self-condemnation (Bandura 1999, 2002; Bandura et al. 1996). In the environmental domain, moral disengagement may manifest in various forms: downplaying the environmental impact of one's actions, shifting responsibility to corporations or governments, minimizing personal agency, or morally justifying unsustainable behaviors as necessary or socially acceptable (Mazar and Zhong 2010; Meijers et al. 2015; Gifford 2011). These rationalizations can effectively neutralize the motivational power of personal norms, enabling individuals to maintain a positive self-image while acting in ways that are inconsistent with their values or beliefs.

Furthermore, understanding how moral identity and moral disengagement interact is critical for advancing our theoretical understanding of proenvironmental behavior. While moral identity may increase the salience of personal norms and promote consistency between beliefs and actions, moral disengagement may inhibit this process by weakening the link between moral self-concept and behavior. Investigating these dynamics can provide valuable insights into why some

individuals consistently act in environmentally responsible ways, while others, despite expressing similar levels of environmental concern or moral commitment, fail to translate these into action.

Of course, moral considerations are only part of the explanatory frameworks mentioned above. Another important part is formed by affective considerations that can originate in the restorative quality of nature (Hartig 2021; Staats 2012), the awe experienced from beautiful natural scenery (Bethelmy and Corraliza 2019; Joye and Bolderdijk 2015), and the possibilities that natural environments create for recreational behavior (Knopf 1987), socializing (Maas et al. 2009), and reflection (Herzog et al. 1997). Through repeated experience, specific natural environments may also create place attachment (the union of place identity that gives meaning and purpose to life) and place dependence – the way a place meets people's needs and goals – (Williams and Vaske 2003). We consider this affective, essentially nonnormative kind of nature-related experiences a second motive for proenvironmental behavior. Although other studies also used terms like *love and care for nature* to capture this construct (Perkins 2010), here we consistently use *connection to nature* (Mayer and Frantz 2004). In the next section, we will address each of the concepts and the way they may affect proenvironmental behavior.

1.2 | Moral Identity, Personal Norms, and Moral Disengagement

1.2.1 | Moral Identity

Self-identity can help shape planned behavior (Rise et al. 2010). This applies to environmental identity as well, which is thought to have a moral component (e.g., Jia et al. 2017; Van der Werff et al. 2013). For example, environmental identity enhanced individuals' sustainable actions by eliciting an intrinsic commitment to behave in ways that align with their self-concept (Van der Werff et al. 2013; Whitmarsh and O'Neill 2010). Moreover, those with a salient environmental identity were more likely to perceive proenvironmental behavior as a moral duty (Van der Werff et al. 2013). For a more comprehensive discussion of environmental identity, we refer, for example, to the work of Van der Werff and colleagues (2013) or Clayton (2003). Building on additional work (Collado et al. 2019; Chowdhury and Fernando 2014; De Groot and Steg 2007; Harland et al. 2007; Lokhorst et al. 2013; Steg and Vlek 2009; Turaga et al. 2010), here we specifically focus on the role of moral identity in fostering proenvironmental behavior.

Moral identity is “the degree to which being a moral person is important to an individual's identity” (Hardy and Carlo 2011, 212). It reflects a relatively stable individual disposition to prioritize moral standards and to act accordingly. People with a strong moral identity do not just follow moral standards because they feel obligated to, but because acting morally is a core part of who they are. If individuals feel that moral values like being honest, compassionate, just, or generous are strong and central to defining their personality, they have a strong moral identity. Hence, moral identity should be considered a part of the broader personal identity.

Although it is demonstrated that moral identity increases individuals' moral actions and counteracts situational pressures and opportunities to act immorally (Aquino et al. 2009; Brebels et al. 2011; Krettenauer and Hertz 2015), moral identity as a specific and distinct part of one's broader personal identity is often overlooked in studying proenvironmental behavior. In this regard, a recent meta-analysis with the overall goal to assess the current state of knowledge on identities and proenvironmental behavior included 104 studies and found that identities are strongly associated with proenvironmental behavior, both individual identities and group identities (Udall et al. 2021). The work included many types of individual identities, such as proenvironmental identity (Dermoddy et al. 2015; Hinds and Sparks 2008; Kaklamanou et al. 2015), place identity (Hernández et al. 2010), fair trade consumer identity (Andorfer and Liebe 2013), green self-identity in environmental protection (Khare 2015a; Khare 2015b), self-identity as a recycler (White and Hyde 2012), pro-environmental politics identity (Sweetman and Whitmarsh 2015), or group identities like social identification with organic consumers (Bartels and Hoogendam 2011; Bartels and Onwezen 2014), group identification with environmentalist (Dono et al. 2010), and social identity (Fielding and Hornsey 2016). However, not one of these studies focused on moral identity in relation to proenvironmental behavior (Udall et al. 2020, 2021).

The limited research that is available in this context showed that moral identity predicted specific green consumption behaviors (Wu and Yang 2018) and increased ethical consumption beliefs (Chowdhury and Fernando 2014).

Whereas green consumption behaviors and beliefs may be considered a specific type of proenvironmental behavior, we suggest that moral identity could serve as an antecedent for a much broader range of proenvironmental behavior. For example, Jia and colleagues (2017) analyzed the motivational link between moral identity and environmental involvement by comparing environmental activists with nonactivists. It was found that negative moral emotions toward environmentally irresponsible others seemed to serve as motivators that can strengthen moral identity and support the intention to help the natural environment. Thus, moral identity can promote the integration of environmental protection into one's sense of self, resulting in further engagement in proenvironmental behavior.

1.2.2 | Personal Norms

In addition to moral identity, some scholars have suggested that personal norms affect proenvironmental behavior (Harland et al. 1999, 2007; Rezvani et al. 2017; Steg and Vlek 2009; Turaga et al. 2010). Personal norms are shaped within specific contexts that are based on the expectations that individuals have for themselves. These expectations are influenced by social interactions, which are then implemented in specific situations. If people do not act in agreement with their moral standards, they may feel guilty or experience a decreased sense of self-worth, whereas acting in line with these standards may lead to feelings of pride and increased self-esteem (Schwartz 1977; Turaga et al. 2010). Hence, conforming to these norms is a source of personal satisfaction and emotional benefit.

Once constructed, personal norms draw from more stable and deeply held general norms and values that are consistent across different situations. Schwartz (1977) emphasizes the subjective nature of personal norms. Individuals attach different levels of importance to different values and norms, which means that the same situation can trigger different strengths of moral obligation in different people. The more important the relevant norms and values are to the individual, the stronger the feeling of moral obligation to act.

However, NAT states that personal norms must first be activated to effectively influence behavior. This activation occurs through situational factors and personality traits activators (Harland et al. 2007). Moral identity can play a role here: reflecting the extent to which moral values are central to the self, it can serve as a key activator of personal norms, shaping how individuals interpret moral situations and their sense of obligation to act accordingly. Indeed, identity encompasses personality traits linked to moral sensitivity, responsibility, and prosocial tendencies—traits as crucial for the activation of personal norms (Harland et al. 2007) as crucial for the activation of personal norms. Therefore, just as personality traits can trigger personal norms, a salient moral identity strengthens their activation, making moral obligations more cognitively accessible and behaviorally influential. Hence, we suggest that moral identity could facilitate the activation of personal norms, which in turn will affect proenvironmental behavior. Individuals with a strong moral identity, who prioritize values like care and fairness, may be more likely to experience a sense of moral obligation to act proenvironmentally when those norms are activated.

1.2.3 | Moral Disengagement

Surprisingly little attention has been paid to the defense processes that are also outlined in NAT, which could weaken the influence of personal norms on adopting proenvironmental behavior. Among these defense processes is moral disengagement. Moral disengagement is composed of eight different mechanisms: moral justification, euphemistic language, advantageous comparison, displacement of responsibility, diffusion of responsibility, distorting the consequences, dehumanization, and attribution of blame (Bandura 1999, 2002; Bandura et al. 1996). The process of moral disengagement can allow individuals to distance themselves from the negative emotions that may result from aversive actions (in this case, environmentally unfriendly behaviors). Indeed, when actions and beliefs are inconsistent, people feel emotional stress, which is highly uncomfortable and needs to be resolved. This situation is also known as a state of cognitive dissonance (Festinger 1957).

In the case of sustainable behavior, it is plausible that facing the moral dilemma resulting from adopting proenvironmental behavior or not (which comports efforts for the individual), individuals may take actions aimed at serving their personal interest (to avoid personal costs) rather than protecting the collective interest (Bandura 2002, 2007). Because these behaviors are usually contrary to one's moral beliefs and personal norms, a situation may arise where individuals feel cognitive dissonance between their moral standard and their behaviors.

Therefore, individuals might use the moral disengagement mechanism to alleviate negative emotions like guilt or shame as the result of acting against one's moral standards.

Bandura (2007) paved the way by applying his theory of moral disengagement to explain how sustainable ecology is sometimes impeded. This notion is further supported by several studies that have explored the influence of moral disengagement on sustainable consumption (e.g., Chowdhury and Fernando 2014; Kilian and Mann 2020; Sharma and Lal 2020), as well as how people justify the purchase of products with negative environmental consequences and responses to climate change (Leviston and Walker 2021). The latter research found that moral disengagement acts as a key factor attenuating both positive actions toward the environment and feelings of guilt associated with climate change. Furthermore, a recent study provided preliminary evidence for moral disengagement operating as an antecedent of the main predictors within the TPB (Ajzen 1991), such as attitude, subjective norms, and perceived behavioral control. In the context of workplace behavior, higher levels of moral disengagement were associated with less positive attitudes toward ethical behavior, compliance with social norms, and the perception of control over ethical action, leading to lower intentions to act ethically (Black et al. 2022).

Prior research appears to have overlooked moral disengagement as a defensive strategy concerning perceived moral obligation to engage in proenvironmental behavior, in a general perspective that considers personal norms, ethical values, and feelings of connection to nature. We suggest that moral disengagement is implicated in the relationship between moral identity and people's engagement in proenvironmental behavior, acting as a defense mechanism that reduces the moral obligation derived from moral identity, personal norms, and feelings of connection to nature, to act in a sustainable direction.

1.3 | Feelings of Connection to Nature

In line with current literature on proenvironmental behavior, an important aspect to take into consideration is the concept of connection to nature. The construct refers to the perception of being part of a community that includes the natural environment (Mayer and Frantz 2004; Perkins 2010; Perrin and Benassi 2009), an idea rooted in biophilia and ecopsychology (Kellert and Wilson 1995; Whitburn et al. 2020). Therefore, one's connection to nature can be considered a value-based attitude (Brügger et al. 2011) that has qualities that are similar to personality traits: it differs between people and groups and it is relatively stable over time and in different situations, but it can still change (Nisbet et al. 2011).

Emotional aspects like a felt connection to nature play a crucial role in the engagement in proenvironmental behavior (Perkins 2010; Perrin and Benassi 2009; Whitburn et al. 2020). In this vein, it has been shown that individuals with a strong connection to nature are more likely to actively engage in positive environmental actions. It occurred for children and young adults (Collado et al. 2013, 2019) and for adults (Fornara et al. 2023; Martin et al. 2020; Tam 2013). These findings are supported by a recent meta-analysis that highlighted a

significant correlation between feelings of connection to nature and engagement in eco-friendly behaviors, a link that remains consistent across different demographic groups (Whitburn et al. 2020).

Research also suggests that the foundation for the development of proenvironmental attitudes and behavior in adult life is created during childhood through exposure to nature (Chawla and Cushing 2007; Hinds and Sparks 2008). Furthermore, experiences in a natural context during childhood determine the development of greater feelings of emotional connection to nature (Collado et al. 2013), which highlights that such feelings develop in the context of one's broader identity development, giving feelings of emotional connection to nature a decisive role in understanding the moral obligation to adopt proenvironmental behavior in adult life.

This relationship has been investigated by several scholars. A recent work found that connection to nature predicts green consumption through biospheric values (Wu and Zhu 2021); individuals with strong biospheric values are more likely to engage in behaviors that benefit the environment because they attribute intrinsic importance to nature (De Groot and Steg 2007, 2008; Scopelliti et al. 2022). Therefore, a strong feeling of connection to nature can motivate people to make environmentally friendly choices, even when these choices involve higher monetary costs or are less convenient for them (Ture and Ganesh 2018; Wu and Zhu 2021).

A strong connection to nature significantly influences the propensity toward environmentally responsible actions (Fornara et al. 2023; Martin et al. 2020; Tam 2013). Indeed, a deep connection with the natural environment, based on a clear recognition of its intrinsic value and a spiritual dimension and associated with feelings of care and responsibility for its protection, can act as a motivational impulse and inspire behaviors that promote sustainability (Whitburn et al. 2020). Important to note is that feelings of connection to nature can act through a moral route (Williams and Vaske 2003), or through a hedonic route that reflects personal interests and preferences (Bethelmy and Corraliza 2019; Joye and Bolderdijk 2015; Kellert and Wilson 1995). In this line, we suggest that connection to nature plays a role in promoting proenvironmental behavior.

1.4 | Current Research

Using the elements outlined above, we explored whether moral identity could have affected proenvironmental behavior while also looking at the roles of personal norms, moral disengagement, and connection to nature within this process. There are several ways that the elements we discussed may be interconnected, creating a fair degree of freedom to explore potential relations in an overall structure that comprises these relations. As discussed above, a number of potential expectations follow directly from the literature: (1) moral identity will affect proenvironmental behavior, (2) connection to nature will positively affect proenvironmental behavior, (3) personal norms affect proenvironmental behavior, and (4) moral disengagement may weaken the tendency to display proenvironmental behavior.

Less clear are relations among the other variables, but we expect that moral identity may activate personal norms (Schwartz 1977), thus preceding personal norms in a causal model. Moral disengagement could be a moderator of the personal norms–proenvironmental behavior relation, but there is actually no study that has focused on the precise nature of these relations. There are evidences that moral disengagement is affected by moral identity (Chowdhury and Fernando 2014; Detert et al. 2008), reducing the effect of moral disengagement on proenvironmental behavior for people with a stronger moral identity. Connection to nature might have a moral component, activating personal norms (Leviston and Walker 2021; Sharma and Lal 2020) and possibly moral disengagement, but might also be an independent antecedent of proenvironmental behavior (Schultz 2001; Perkins 2010), or might work in more than one way. We did not have expectations about the relationship between moral identity and connection to nature.

Important to emphasize is that in the current study, we opted for an exploratory approach. We did not posit formal hypotheses, but tested four of the theoretically most likely models in a sequence of increasing sophistication and theoretical assumptions. In each of these models, we assumed that moral identity acts as a foundational antecedent influencing proenvironmental behavior both directly and indirectly through various mediators and moderators. The aim was to identify the best fitting model, which is what we focus on in the remainder of this study. The diagrams of all four theoretical models we tested are provided in Supporting Materials S1. Last, we chose to focus on a younger segment of the population, because of its unique and dual position in the environmental crisis scenario. Indeed, on the one hand, it bears the weight of past negligence; on the other hand, they hold substantial responsibility for future decisions and behavioral shifts needed to address ongoing environmental challenges (Wallis and Loy 2021). As such, understanding the psychological and moral drivers of proenvironmental behavior in this group is both timely and essential.

The study adhered to the principles of the Declaration of Helsinki and received approval from the Ethics Committee of LUMSA University (Protocol Code 4/2023, Approval Date 02/05/2023). For participants under the age of 18, only those with parental consent were permitted to participate. The data are part of a larger research project; additional constructs were measured concurrently with those relevant to the present study. However, those variables are not reported here as they are part of a different stage of our research (see Marchetti et al. 2024).

2 | Methods

2.1 | Participants and Design

We employed a cross-sectional design to examine the relationships between the variables with all the data collected at the same time. The study involved 359 Italian aged from 17 to 35, with a mean age of 22 years ($M = 22.20$; $SD = 3.99$). In total, 71.3% of participants identified themselves as women, 27.7% as men, and 1.1% preferred not to specify. The sample included workers and university students from Northern, Central, and Southern Italy. The inclusion criteria were: (a) being an Italian

young adult (aged between 17 and 35 years) and (b) voluntarily agreeing to participate. Only volunteer participants who provided informed written consent were included in the study. They did not receive any financial compensation for their participation. The study utilized a convenience sampling method, recruiting participants through networking with friends, colleagues, and casual acquaintances. The research was conducted in Italy, so for convenience, a sample of Italian participants was chosen.

2.2 | Procedure and Measures

Data were collected through an online questionnaire administered via the Google Forms platform, which did not allow respondents to proceed if the fields were not completed, resulting in no missing data. Participants completed the questionnaire individually with their smartphone or personal computer, with their anonymity assured. The questionnaire was divided into two sections: the first part included the informed consent form and general instructions for completion, while the second part contained the scales to measure the constructs. These were presented in the following order: Moral Identity (MI), Love and Care for Nature (LCN), Civic Moral Disengagement (CMD), Moral Norms (MNorms), General Ecological Behavior (GEB).

Moral identity was assessed using the MI questionnaire (Zhu et al. 2011). The scale consists of five items (e.g., “I view being an ethical person as an important part of who I am,” or “I am determined to behave consistent with my moral ideals or principles”). Ratings were made on a 5-point Likert-type scale, ranging from 1 = *completely disagree* to 5 = *completely agree* ($\alpha = 0.78$).

To assess the connection to nature we used the LCN scale (Perkins 2010), consisting of 15 items (e.g., “I feel content and somehow at home when I am in unspoiled nature,” or “When I am in natural environments, I feel emotionally connected to nature”). Ratings were made on a 5-point Likert-type scale, ranging from 1 = *completely disagree* to 5 = *completely agree* ($\alpha = 0.95$).

Moral disengagement was assessed using the CMD scale (Caprara et al. 2009), consisting of 32 items (e.g., “When there are no efficient refuse disposal services, there is no sense reproaching citizens who leave trash on the street,” or “There is no sense feeling guilty for damages we have contributed to a problem if our contribution is a small part of the problem”). Ratings were made on a 5-point Likert-type scale, ranging from 1 = *completely disagree* to 5 = *completely agree* ($\alpha = 0.94$).

To assess people’s personal norms, we administered the Moral Norms questionnaire (MNorms; De Leeuw et al. 2015). Following the stem: “When you perform proenvironmental behaviors how do you feel?” participants were asked to respond to four items: (e.g., “I think that I would be a responsible person,” or “I would have a good conscience”). Ratings were made on a 5-point Likert-type scale, ranging from 1 = *completely disagree* to 5 = *completely agree* ($\alpha = 0.87$).

Proenvironmental behavior was measured using the General Ecological Behavior scale (short version, Italian adaptation)

(GEB; Kaiser 1998; Kaiser et al. 2007; Scopelliti et al. 2022). The 30-item scale provides a generalized assessment of proenvironmental behavior that covers various behaviors, using items like “I am a member of an environmental organization” (ecological), “After 1 day of use, my sweaters or trousers go into the laundry” (everyday), “If possible, I buy products in refillable packages” (recycling), or “I usually ride a bicycle, take public transportation or walk to go to the university/at work” (mobility). Ratings were made on a 5-point Likert-type scale, ranging from 1 = *completely disagree* to 5 = *completely agree* ($\alpha = 0.80$).

3 | Results

3.1 | Analyses and Interpretations

To provide the first overview, data were analyzed using SPSS statistical software (v. 29 of Windows). Mean, standard deviation, minimum and maximum, skewness, and kurtosis for all variables were calculated. Then, a Pearson’s correlation analysis was performed to assess the associations between the variables under study. Table 1 shows the correlation matrix. Moral identity was strongly associated with high levels of personal norms, feelings of connection to nature, proenvironmental behavior and lower levels of moral disengagement.

3.2 | Path Analyses

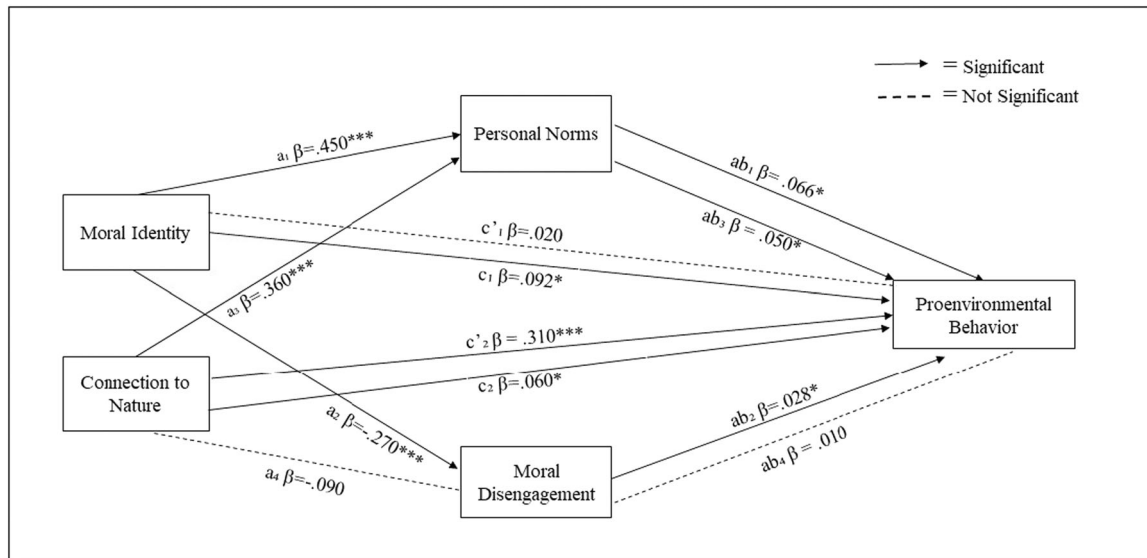
Path analysis was conducted with EQS 6.4 for testing the Hypothesized Structural Path Model and Alternative Structural Path Models, and was used for testing the hypotheses about direct associations. Path analysis conducted with EQS 6.4 coupled with PROCESS Bootstrapped mediation regression analysis (Hayes 2022) conducted with IBM SPSS version 29 was used for testing the hypotheses about indirect associations. Cutoff values for Omnibus Fit Indexes were used for determining model fit, for good model fit (e.g., Schumacker and Lomax 2004). χ^2 should be nonsignificant, the Non-Normed Fit Index (NNFI) should have a value of 0.95 or higher, the Comparative Fit Index (CFI) should have a value of 0.95 or higher, and the Root-Mean-Square-Error-of-Approximation should have a value of 0.05 or lower. Researchers (e.g., Diamantopoulos and Siguaw 2000) have also determined cutoff values for acceptable model fit with acceptance of significance for χ^2 , NNFI a value of 0.90 or higher, CFI a value of 0.90 or higher, and RMSEA a value of 0.10 or lower. For interpretation of the alternative non-nested model tests, Omnibus Fit Indexes were interpreted coupled with interpretation of the Akaike Information Criterion (AIC) because a lower AIC suggests a better fitting model (Bentler 2006). With EQS 6.4, a Harman 1-factor measurement model test was conducted as a check for likely common method bias (e.g., Podsakoff et al. 2003).

Of the models we tested, the first model (Model A) was the simplest one, with minimal assumptions about its structure, the second model (Model B) incorporated specific theoretical assumptions, while the third model (Model C) involved even stronger theoretical assumptions, as well as the fourth model

TABLE 1 | Descriptive statistics and correlations.

	<i>M</i>	<i>SD</i>	<i>SK</i>	<i>KU</i>	1	2	3	4
1. Moral Identity	4.20	0.63	-0.88	1.15	—			
2. Personal Norms	4.24	0.71	-0.94	0.98	0.59	—		
3. Moral Disengagement	2.06	0.66	1.00	1.03	-0.31	-0.24	—	
4. Connection to Nature	3.83	0.83	-0.45	-0.22	0.39	0.54	-0.20	—
5. Proenvironmental Behavior	3.31	0.50	-0.10	0.40	0.26	0.35	-0.20	0.42

Note: All correlations are significant at $p < 0.01$.

**FIGURE 1** | Parallel mediation model with two predictors: moral identity and connection to nature. $***p < 0.001$; $*p < 0.05$.

(Model D). Data showed most support for the Hypothesized Structural Path Model of the third model (Model C); this was the only structural model that had good model fit (see Figure 1). For conciseness, we focus exclusively on this model, that posits moral identity and connection to nature as parallel predictors for proenvironmental behavior, mediated by personal norms and moral disengagement. Results for the other three models are reported in Supporting Materials S1.

First of all, the Omnibus Fit Indexes for the measurement model relevant for the Harman 1-factor test suggested, by means of non-model fit ($\chi^2 = 12982$, $df = 3569$, $p < 0.001$, NNFI = 0.34, CFI = 0.36, RMSEA = 0.09), that the majority of the covariance among the measures was not accounted for by only one general factor, arguing against bias due to common method variance. Hereafter, path analysis showed that the overall structural path model (Model C) has good model fit ($\chi^2 = 0.62$, $df = 1$, $p = ns = 0.43$, NNFI = 1.01, CFI = 1.00, RMSEA < 0.05, AIC = -1.39). Non-nested alternative models were tested as alternatives to the Hypothesized Structural Model (Model C).

3.3 | Direct and Indirect Association Tests

Regarding interrelations, it was predicted that connection to nature and moral identity would associate directly with proenvironmental behavior, personal norms, and moral

disengagement. The path analysis showed that connection to nature ($\beta = 0.31$, $p < 0.001$) but not moral identity ($\beta = 0.02$, $p = ns$), related directly to proenvironmental behavior. Furthermore, the path analysis revealed that moral identity ($\beta = 0.45$, $p < 0.001$) and connection to nature ($\beta = 0.36$, $p < 0.001$) related directly and significantly to personal norms. It was also found that moral identity ($\beta = -0.27$, $p < 0.001$) related directly and negatively to moral disengagement, while connection to nature was found not related to moral disengagement ($\beta = -0.09$, $p = ns$).

Furthermore, the model predicted that connection to nature and moral identity would relate indirectly to proenvironmental behavior via personal norms and moral disengagement, which therefore constitute two different parallel mediators of the model. The path analysis suggested that moral identity ($\beta = 0.09$, $p < 0.05$) and connection to nature ($\beta = 0.06$, $p < 0.05$) indeed may associate indirectly with proenvironmental behavior. Yet, PROCESS bootstrapped regression analysis was conducted for further insight, and this showed that moral identity indeed has a significant indirect association with proenvironmental behavior via, respectively, personal norms ($\beta = 0.06$, $p < 0.05$) and via moral disengagement ($\beta = 0.028$, $p < 0.05$), while connection to nature was only found significantly indirectly related to proenvironmental behavior via personal norms ($\beta = 0.05$, $p < 0.05$) and having a nonsignificant indirect association via moral disengagement ($\beta = 0.0097$, $p = ns$).

4 | Discussion

The present research aimed to extend current knowledge on proenvironmental behavior by exploring different possible explanatory models, considering proenvironmental behavior from a moral and affective perspective. All tested models accounted for the potential relationships among key variables involved in activating this behavior. Across all models, we consistently posited moral identity as an antecedent activator, exploring its different possible relationships with personal norms, moral disengagement, and connection to nature (see Models A, B, C, and D in Supporting Materials S1). The best fitting model turned out to be a model in which connection to nature and moral identity are two, partially independent, predictors of proenvironmental behavior, as illustrated in Figure 1. In developing this model, we argued that moral identity and connection to nature directly and indirectly predict proenvironmental behavior through the parallel mediation effect of personal norms and moral disengagement. Our findings support this model. Thus, the present research revealed the complex interplay between moral identity, connection to nature, and their combined influence on proenvironmental behavior.

First of all, our findings show that moral identity predicts proenvironmental behavior mediated by personal norms (Harland et al. 2007; Schwartz 1977). In other words, moral identity, as a stable personality trait, activates personal norms, similarly to personality traits activators (Harland et al. 2007) as postulated in NAT.

At the same time, our results show that moral identity affects proenvironmental behavior through reducing the effect of moral disengagement. In other words, individuals with a strong moral identity are less likely to use a mechanism defense like moral disengagement, which in itself decreases engagement in proenvironmental behavior. This result is in line with previous studies which showed that moral disengagement mediates both the link between moral identity and unethical decision-making (Detert et al. 2008), and between moral identity and ethical consumption beliefs (Chowdhury and Fernando 2014).

Additionally, our findings show that proenvironmental behavior is predicted by connection to nature. Feeling part of the natural environment makes people more likely to act in a sustainable way, as also found in previous studies (Collado et al. 2013, 2019; Ibáñez-Rueda et al. 2020; Marchetti et al. 2024; Scopelliti et al. 2018; Whitburn et al. 2020). Furthermore, we found an indirect effect of connection to nature on proenvironmental behavior, mediated by personal norms. This result is also in line with previous research (Richter and Hunecke 2022; Wu and Yang 2018), showing that feelings of connection to nature promote the activation of their personal norms, which in turn predicts proenvironmental behavior, but do not decrease moral disengagement. Hence, moral disengagement does not mediate the relationship between connection to nature and proenvironmental behavior. In other words, the defense mechanisms which hinder proenvironmental behavior are not attenuated by connection to nature.

This study makes novel contributions to existing literature. First, we proposed and examined a theoretical model to

explain proenvironmental behavior via a moral and an affective perspective. Additionally, our work extends earlier studies by considering a broad spectrum of proenvironmental behavior, encompassing domains such as sustainable mobility, recycling, environmental organization membership, and energy conservation (Kaiser et al. 2007; Steg and Vlek 2009). Furthermore, our findings are supported by a recent meta-analysis that recognized identity as a key antecedent of individuals' engagement in proenvironmental actions (Udall et al. 2021). However, our study extended the meta-analysis conducted by Udall and colleagues (2021), since the authors showed significant correlations between various types of identity and proenvironmental behavior, but they did not consider *moral identity* (see Udall et al. 2020, 2021). This highlights the role of identity in activating personal norms that guide behavior, and even more so, the fundamental importance of this specific type of identity, in this context. This would represent a novel lens through which to examine the multifaceted nature of proenvironmental behavior, extending current knowledge in the field.

Our findings show that moral identity may be instrumental in fostering individuals' engagement in sustainable actions. Indeed, as suggested before (Hertz and Krettenauer 2016) moral identity predicts moral behavior by providing individuals with the motivation to enhance the competencies required to act virtuously (Besser 2017; Stichter 2018). This motivation stems from the ultimate aim of wanting to be a moral person where commitments (e.g., obligations, rules, etc.) and personal concerns (e.g., values, beliefs, interests, affects, etc.) are integrated in a way that the fulfillment of the one implies the fulfillment of the other (Krettenauer 2024).

Furthermore, our results show that moral identity acts on proenvironmental behavior through the parallel mediation effects of personal norms and moral disengagement, in opposite directions. In other words, personal norms and moral disengagement operate simultaneously and independently in transmitting the effect of moral identity on eliciting proenvironmental behavior. In this vein, moral identity activates individuals' personal norms, which in turn, shape proenvironmental action. This result is supported by NAT (Schwartz 1977; Harland et al. 2007).

Similarly, the present study also shows the role of moral disengagement in the relationship between moral identity and proenvironmental behavior. Indeed, our findings show that moral disengagement negatively mediates the relationship between moral identity and proenvironmental behavior. This result is in agreement with previous research, which explored moral disengagement in relation to ecological outcomes, and found that moral disengagement negatively mediated the relationship between individuals' engagement in sustainable consumption and self-exoneration (Sharma and Lal 2020), as well as the relationship between individuals' climate change perception and involvement in proenvironmental behavior (Leviston and Walker 2021). It is also supported by NAT, and sheds some light on the way defense processes operate, something that is not explicitly stated in the original theory (Harland et al. 2007).

An important finding is that the best fitting model diverged from theoretically more simple models by showing that

proenvironmental behavior is predicted not only via moral identity, but also via feelings of connection to nature. Our results show that connection to nature predicts proenvironmental behavior, directly and indirectly via the mediating effect of personal norms, but not via the effect of moral disengagement. In agreement with previous studies (Collado et al. 2013; Ibáñez-Rueda et al. 2020; Marchetti et al. 2024; Scopelliti et al. 2018; Whitburn et al. 2020), this sense of interconnectedness with the natural environment directly influences people's proenvironmental behavior (Schultz 2001; Perkins 2010). Whereas such a direct link is widely recognized in the literature (e.g., Collado et al. 2019; Collado and Staats 2024; Rezvani et al. 2017; Schultz and Kaiser 2012), our findings reveal that the relationship is partially strengthened through the mediating influence of personal norms. In other words, connection to nature activates personal norms, which in turn predict proenvironmental behavior. One explanation of this process might be that connection to nature may act as personality trait activator of people's behavior, such as described by NAT (Schwartz 1977; Harland et al. 2007). Individuals who feel a strong connection to nature are more likely to perceive themselves as an integral part of the natural world (Perkins 2010; Wilson 2019; Wu and Zhu 2021) cultivating a moral obligation to protect nature (Leopold 1986), which in turn affects the activation of their personal norms toward proenvironmental behavior.

This perspective is further supported by our results that demonstrate that moral disengagement does not have a significant mediating effect on the relationship between connection to nature and proenvironmental behavior. As a result, moral identity drives the reduction in the implementation of defense mechanisms individuals may employ in response to the moral obligation to engage in proenvironmental behavior and activates the personal norms. Connection to nature also operates through personal norms but has an important additional direct effect. Explaining this particular effect is challenging; it would require further research to test our expectation that this comes from hedonic qualities, the personal benefits experienced from being in nature. Other research suggests this explanation (Collado et al. 2013; Hartig et al. 2007), referring to restorative qualities of nature, and awe and admiration of the beauty of nature. Another promising perspective, but not opposed to the hedonic explanation, could be based on SDT (Ryan and Deci 2000), which proposes a series of types of motivation, ranging from purely extrinsic to completely intrinsic, in which in particular the two most intrinsic types of motivation might explain the direct effect: people for whom proenvironmental behavior is based on the "synthesis with self," and "enjoyment and inherent satisfaction" (see Ryan and Deci 2000, 72; Figure 1).

5 | Limitations

Several limitations to our study should be considered. First, we used a cross-sectional design (i.e., the data were collected all at the same time), and relations could be established at the theoretical and statistical level only; to identify causal relationships, focused experimental studies will be needed. We hope to have provided a theoretical framework to inspire such research.

In addition, the present study was an exploratory study; alternative models describing different relationships between the core variables may certainly exist, and specific (alternative) hypotheses could be developed and tested. Exact causal pathways are not well defined in NAT (Schwartz 1977), and much remains to be explored. As confirmed in our results, especially the position of moral disengagement would deserve thorough scrutiny.

A third limitation of the study lies in the age-specific nature of the sample, which was restricted to a younger population segment. It constrains the extent to which the findings can be generalized to the broader population. Future research is needed to determine whether the patterns observed in this study are consistent across different age groups.

Finally, the choice of instruments to test the main constructs (i.e., moral identity and proenvironmental behavior) could be a limiting factor. To assess proenvironmental behavior we used the General Ecological Behavior scale (GEB; Kaiser et al. 2007; Scopelliti et al. 2022), which is a broad and general scale encompassing both daily practices (such as recycling, conserving energy, or mobility), and broader engagement like supporting environmental organizations. Whereas individuals may feel a moral obligation to engage in daily proenvironmental actions like recycling or sustainable mobility, the same link might not extend to the broader dimension. People might not perceive the same level of moral imperative to financially support environmental causes or actively participate in environmental organizations. Consequently, moral identity might not be as influential in predicting these broader proenvironmental behavior, potentially impacting the overall interpretation of the results. Thus, the type of proenvironmental behavior might be a moderator of the relations we have described here. Additionally, while to assess moral identity we used the Moral Identity scale (Zhu et al. 2011), alternative measures, such as the one developed by Black and Reynolds (2016), might offer a more comprehensive and nuanced operationalization of this construct. In all, different results could be obtained in future research using different instruments to assess the construct.

6 | Conclusion

We showed that both moral identity and feelings of connection to nature are significant predictors of proenvironmental behavior. Whereas one's connection to nature exerted a direct influence on proenvironmental behavior, moral identity, lacking a direct effect, operated indirectly by fostering personal norms and mitigating moral disengagement. In turn, connection to nature also demonstrated an indirect effect on proenvironmental behavior, acting on personal norms, but not on moral disengagement. Therefore, our findings highlight the multifaceted nature of proenvironmental engagement, suggesting that it is facilitated by both hedonic experiences in nature and a sense of moral obligation to act sustainably, which are integrated into one's self-concept and reinforce proenvironmental commitment at an identity level.

These results offer potentially useful insights for developing environmental interventions that are directed to young generations. Strategies encouraging direct experiences in nature may leverage the affective pathway, while appeals to individuals' moral standards may activate the indirect pathway, through moral identity. We encourage further researchers to extend our contribution to explore the interplay of these pathways and their respective influences on proenvironmental behavior.

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