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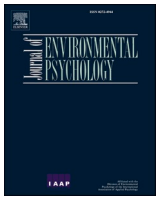

Pro-environmental attitudes and behavior: The role of religion and spirituality in secularized Europe beyond relevant individual differences☆

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ABSTRACT

The role of religion and spirituality in pro-environmental commitment in secular societies like the European ones is understudied, and it is unclear whether it is unique, beyond relevant individual differences. In Study 1 (342 adults in Belgium), we measured pro-environmental identity and behavior, collective identities, awe, generativity, authenticity, self-enhancement (power/achievement), openness-intellect, political orientation, religiosity, fundamentalism, and spirituality. Uniquely and additively, awe, left-wing orientation, and low religiosity predicted pro-environmental identity; and generativity, openness-intellect, low self-enhancement, and low religiosity—more importantly than for identity—predicted pro-environmental behavior. Fundamentalism predicted low pro-environmental behavior partly through low awe and high self-enhancement; (non-religious) spirituality predicted the opposite partly through high awe, generativity, and openness-intellect. In Study 2, analyses of EVS 2017 data ($N = 53.410$, 33 countries) showed that atheists are more pro-environmentalist than religionists, but, across religious-cultural zones, spiritual people outperform religionists and nonbelievers in pro-environmental attitudes, an effect existing beyond those of generativity (care for others, performance orientation), global identity, and political orientation. The two studies converge on that in, mostly secularized, European societies, beyond the role of relevant psychological characteristics, religiosity, not only fundamentalism, seems to undermine pro-environmental engagement, whereas spirituality does the opposite as far as it disconnects from traditional religion.

1. Introduction

Across social sciences and the humanities, there has been significant debate on whether religions in general and Christian traditions in particular have historically promoted and/or promote today concern for the environment or have rather undermined such concern (e.g., Johnston, 2013; Michaels et al., 2020; White, 1967). For instance, considering the world as being created by God may encourage religionists to care about nature and the environment, whereas believing that God expects humans to exploit natural resources to grow and expand may facilitate indifference for and de-consideration of nature and the environment (Eom & Ng, 2023; Leary et al., 2016).

The psychological investigation of the role of religion on pro-environmental dispositions has been sporadic but ongoing in the last four decades and has intensified since the mid-2010s (Gifford & Nilsson, 2014; Ng & Eom, 2024; Preston & Baimel, 2021; Saroglou, 2019). This research has provided results with inconsistencies but also some consistency on certain trends. Overall, the role of *common religiosity* (belief, practice, self-identification as religious, affiliation) on pro-environmental attitudes and behavior was found to be positive, negative, or null. No clear cues explain this discrepancy—other than that it depends on the specific religious ideology promoted in each context, mainly, the *stewardship* versus *dominion* of the creation/world religious worldview. This explanation can though be considered as too proximal to the outcome. Furthermore, a clear contrast has been documented between *fundamentalist* religious forms, playing a detrimental role on pro-environmentalism, and *open-minded*, symbolic forms such as spirituality or religion-as-quest that do the opposite. While important, this distinction also needs a better psychological understanding, beyond simply considering the underlying respective conservative versus liberal attitudes, an explanation that may be seen as too proximal to the predictor. Finally, the existing today research heavily comes from studies in

☆ Data and Protocol of Study 1 are available at (anonymized link) https://osf.io/x8wv2/?view_only=853ca387d41944328db48968bc8e61b3. Data and questionnaire of Study 2 (European Values Survey Wave 5) are publicly available at https://search.gesis.org/research_data/ZA7500.

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the US, international data global analyses, and comparative studies between the US and Asian religious/cultural contexts, leaving thus open the question of what happens in well secular countries like most countries of the European continent. By "secular" we mean societies where not only there exists separation between state and religions, but where individuals' investment on religious beliefs, practice, norms, and institutions has importantly decreased to the point that nonreligion and atheism have become, at least equally, normative and socially accepted.

This work aims to address the above issues. Through two studies, the first in a typical secularized Western European country and the second in 33 European countries showing religious/cultural variability, we aim to advance our psychological understanding of the role common religiosity, fundamentalism, and spirituality play, possibly uniquely, on pro-environmental engagement, along with relevant psychological dispositions related to cognition, emotion, values, and self-concept/identity. The specific questions investigated and the corresponding rationale for the expectations are detailed below.

1.1. Religion vs. irreligion and pro-environmentalism in secular societies

Following a PsycINFO search (environment* or sustainab*, in the title, and relig* or spiritual*, in title or abstract) for peer-reviewed publications since 2018, we performed, for the purposes of the present work, as for August 2025, an overview of more than 30 quantitative studies having measured the link between individual religion/spirituality and pro-environmentalism. This overview allowed us to detect an interesting trend behind the apparent inconsistency regarding the role of common religiosity on pro-environmentalism, which, as mentioned above, may be positive, negative or null across the studies. Four analyses of the large World Values Survey data from dozens of countries across continents documented a positive role of religiosity, and this across the major religions (Felix et al., 2018; Hekmatpour, 2022; Mostafa, 2016; Wojcik, 2023; but see Gabler & Eilert, 2024, when the outcome is environmental *activism*). However, studies in single countries, in the US and in non-Western countries, and studies comparing the US context (mostly Christian participants) with non-Western, Asian and/or Eastern religious contexts (of Buddhist, Hindu, and Muslim tradition) most often indicated a positive role of religion/religiosity in the non-Western contexts but a negative one in the US (e.g., Johnson et al., 2023; Minton et al., 2016, 2022; see more studies in Supplementary Material Table S1).

This contrast can be interpreted as indicating some specificities of the US context such as politically and religiously highly polarized attitudes (Pew Research Center, 2022). Alternatively, it may suggest more broad (1) cross-religious differences, with Eastern religions having more nature-friendly theologies than Christianity, (2) cross-cultural differences between collectivistic countries (where religion fits better with care for the community) and individualistic ones, and/or (3) societal differences between traditional/religious societies (where moral concerns tend to be more present among the religious) and modern/secular societies.

To broaden the perspective and allow ourselves to ask additional and new research questions, we focused here on another broad cultural context, i.e., the rather secularized European countries. Though sharing with the U.S. a Christian heritage, Europe constitutes a partly distinct cultural context. First, many European countries are more secularized than the U.S. if we consider indicators such as the rate of those religiously affiliated, belief in life after death, and frequency of prayer (Pew Research Centre, 2025). Second, across European countries there exists notable variability on the individualism-collectivism continuum (World Population Review, 2025).

The context of European countries may thus be well appropriate to investigate the role of religion and spirituality in clearly secularized societies. Surprisingly, this question is largely understudied—we identified only three studies since 2010 (Gutsche, 2019; Kaplan & Iyer, 2021; Muñoz-García, 2014, respectively in Germany, Greece, and Spain), providing in addition opposite results regarding the role of common religiosity.

Therefore, the first aim of the present work was to investigate the role of religion and spirituality in pro-environmental attitudes and behavior in the specific context of secularized Europe. This is of clear theoretical and social interest. Does in such context religiosity constitute an amplifier or a reducer of pro-environmental concerns? In principle, one should expect religiosity to amplify societal pro-environmental concerns that are normative in the discourse of religious authorities (United Nations Environment Programme, n.d.); or at least not to reduce them given that in such contexts religionists tend to follow (liberal) societal developments especially when the latter do not oppose religious morality (Saroglou, 2019). However, research shows that, beyond such broad mean-level shifts in morality in general, the differences between religionists and nonbelievers in secular societies become greater, compared to traditional religious, collectivistic, countries (Wilkins-Laflamme, 2016). This is because the contrast between believers' and nonbelievers' values and worldviews increases and nonbelievers become socially engaged in societies where they no longer feel belonging to a minority.

Another objective of focusing in the present work on secularized cultural contexts was to better evaluate spirituality's role. In such contexts, the independence of modern spirituality from traditional religion has increased. In traditional religious cultural contexts, spirituality mostly denotes the—still institutionalized—devotional aspect of (institutionalized) religion. In secular contexts it denotes, independently from and possibly in opposition with religion, belief in some kind of transcendental entity or principle (not a personal God), feelings of oneness with others and the world, and other-oriented, not self-centered materialistic, values (Saroglou, Clobert, et al., 2020; Wixwat & Saucier, 2021).

In sum, we expected in secular European societies religiosity not to contribute to pro-environmental dispositions, with nonbelievers being possibly more pro-environmentally engaged than religious believers. Spirituality should contribute to such dispositions, especially when distancing itself from traditional religion.

1.2. Attitudes versus behavior; diversity of behaviors

Pro-environmental attitudes and behavior are known to be moderately interrelated but also to be characterized by non-negligible discrepancy (Marcinkowski & Reid, 2019). Pro-environmental attitudes may be high in societies where they are normative, but behavior may be more costly and less easy to implement, especially as it implies changes in the way of doing things in everyday life. In parallel, religious people tend to perceive themselves as more prosocial and moral than others (Karim & Saroglou, 2025; Sedikides & Gebauer, 2021), but discrepancies on prosociality and other moral domains between attitudes/values and behavior are common among religious people (Abrams et al., 2021).

This question of coherence or discrepancy between pro-environmental attitudes and behavior as a function of religion and spirituality, to our knowledge, has been understudied. In a previous study focusing on behavioral intentions, beliefs in climate predicted pro-environmental behavioral intentions less strongly among more religious people than less religious people (Eom, Saad, & Kim, 2021). Considering the above observations, we expected the negative links, of fundamentalism, and possibly religiosity, to be stronger for pro-environmental behavior than attitudes. No such discrepancy should be observed for spirituality which is rather intrinsically motivated (Moon et al., 2020) and seems to enhance others' intrinsically motivated pro-environmental behavior (Afsar et at., 2016).

An auxiliary objective was to identify whether religious forms relate similarly or not to different types of pro-environmental behavior. Previous research mostly focused on religion's role in pro-environmental *attitudes*; few studies did so on behavioral *intentions*; and few others

included few- or multi-item measures of pro-environmental *behavior* but only computed a global score. Diverse pro-environmental behaviors, beyond their interrelation, vary in aspects such as motives, cost, and private or public character (Gkargkavouzi et al., 2019; Mateer et al., 2022).

1.3. Religious forms and pro-environmentalism: psychological explanatory factors

How can we psychologically explain the effects, across studies, of common religiosity (often negative effects in the West), fundamentalism (negative), and spirituality (positive) on pro-environmental attitudes and behavior? Furthermore, are these effects unique, beyond other relevant psychological dispositions, and do some of the latter mediate religion's effects? These two questions, understudied in past research, also constituted objectives of the present work.

As evoked above, the religious worldviews of stewardship (humans were placed in earth by God to care for his creation) versus dominion (they were placed in earth by God to use resources for growth and development) explain, cross-sectionally and experimentally, the respective positive versus negative pro-environmental outcomes of religion (Eom, Tok, et al., 2021; Ng & Eom, 2024; Pasaribu et al., 2022; Shin & Preston, 2021). Nevertheless, these worldviews are too proximal to the outcomes. Similarly, low pro-environmentalism as a function of fundamentalism is explained by right-wing authoritarianism (Preston & Shin, 2022). Nevertheless, again, this explanation is too proximal to the predictor—fundamentalists can simply be defined as religious authoritarians.

In the present work we focused on a series of psychological characteristics that could reasonably be considered as individual differences sustaining both pro-environmental dispositions and forms of religiousness—common religiosity, fundamentalism, and spirituality. For the concision of the Introduction, we briefly present them here integrated under higher order dimensions. High versus low pro-environmental attitudes and behavior as well as, respectively, spirituality versus fundamentalist, traditional religious expressions, should be characterized by: (1) other-oriented, not self-centered dispositions (care for others, low self-enhancement—power and ambitious achievement); (2) generativity, not staying a mere world's observer (social generativity for the community, performance orientation); (3) universalistic, global (world, European) rather than local (national, regional) collective identity; (4) connection with the inner self and the world as our home (sense of authenticity, emotional admiration of nature and the world, i.e., awe); and (5) high cognition, to understand the complex scientific facts regarding the environmental crisis (Big Five intellect).

There is initial evidence on the role compassion, care, and altruism (Das et al., 2025; Preston & Shin, 2022) as well as awe (Kaplan et al., 2024) and authenticity (Castaigne, 2022) may play in explaining the association of spirituality with pro-environmental outcomes. Furthermore, research suggests that both pro-environmental dispositions and religiosity-spirituality should positively related to generativity (Matsuba et al., 2012; Wink & Dillon, 2003) and negatively to self-enhancement values (Schwadel & Hardy, 2022; Schultz et al., 2005), whereas they may diverge, depending on the form of religiousness, regarding global and local identities (Aydin et al., 2022; Saroglou & Cohen, 2013) and Big Five intellectual openness (Ashton & Lee, 2021; Puech et al., 2020). To our knowledge, the present work is the first to investigate psychological explanations of the association of religion and spirituality with pro-environmentalism, by integrating into the same study a series of relevant individual differences.

We expected the above psychological dimensions to sustain pro-environmentalism and, at least some of them, to partly explain the effects of religious forms on pro-environmentalism. Nevertheless, we expected religion and spirituality to still exert a unique role in predicting pro-environmental attitudes and behavior since they involve series of relevant worldviews on humans and their relations to nature and the world, and on the future of the world, and these worldviews are regularly activated through texts, rituals, and communities.

1.4. Overview of the studies and cross-cultural issues

To investigate the above questions, we conducted Study 1 in a typical secularized Western European country (Belgium; European Commission, 2019) and we analyzed, in Study 2, large data from 33 European countries. In both studies we measured religiosity and spirituality (and fundamentalism in Study 1), pro-environmental attitudes (and behavior in Study 1), and other individual differences. The latter included: in both studies, prosociality (social generativity in Study 1, care for others in Study 2), global identity (and local identity in Study 1), and political orientation (as a covariate to be controlled for); and additionally, in Study 1, awe, authenticity, values of self-enhancement, and intellectual openness, and in Study 2, performance orientation.

The studies' cultural context allowed us to investigate a final question, i.e., possible similarities and cross-cultural/religious differences. In Study 1, religionists were composed mostly of Christians and Muslims. In Study 2, the 33 countries were of Protestant, Catholic, Christian Orthodox, and Muslim heritage. Based on previous research (Felix et al., 2018; Wojcik, 2023), we expected (1) similarities across religious cultures in the way spirituality versus fundamentalism/traditional religion relates to pro-environmentalism and (2) between-religious cultures differences in the mean-level of pro-environmental constructs and in the strength of their associations with religious measures.

2. Study 1

2.1. Method

2.1.1. Participants

Participants were recruited through social media and work and study networks of the authors and subsequent snowball technique. The study was available online and it was advertised in very general terms, not to activate perceptions of pro-environmental attitudes. Following a prior power analysis with G* Power (with $\alpha = .05$; $1\text{-}\beta = .80$), the necessary sample size to detect lower to medium effects in regression models with 13 predictors was at least $N = 267$. A total of 342 participants completed at least 80 % of the survey and were retained for the analyses. They were adults (18–78 years-old, mean age 38.17, $SD = 12.9$), in majority women (82 %), and almost all (93.3 %) lived in Belgium, the remaining ones coming from other countries. The sample was composed of students (17.8 %), employees/workers (62.6 %), and unemployed or retired (8.5 %), the remaining 10.8 % reporting "other". Participants self-identified as Christian (24.1 %; 17.3 % Catholics), Muslim (33 %), Jew (1.8 %), atheist (22.8 %), and agnostic (10.2 %). This distribution is not representative of the nation's population but corresponded to the study's aim to include at least two major religious groups.

2.1.2. Survey and measures

Data was collected from July 2024 to May 2025. The study has received approval from the Ethics Committee of the authors' Research Institute (May 17, 2024, Projet2024-43). Participants provided their informed consent online before starting the survey. The data and the study's protocol are available at https://osf.io/x8wv2/?view_only=853ca387d41944328db48968bc8e61b3. Except if specified otherwise, 7-point Likert scales were used across measures.

2.1.2.1. Pro-environmental behaviors. Participants were asked to rate the frequency with which they adopt 12 pro-environmental behaviors which were taken from the 21 items of the *Recurring Pro-Environmental Behavior Scale* (Brick et al., 2017). The items were selected to maximize diversity of behavior types, individual variability, and cultural fitness. For each behavior, 5-point Likert scales are proposed, varying

from *Never* to *Always*, but we specified frequencies, to avoid too subjective appreciations (see recommendation by Lange & Dewitte, 2019), as follows: *Never* (0 times of pro-environmental behavior out of 10 times of the behavior's occurrence), *Rarely* (2–3/10 times), *Sometimes* (4–6/10 times), *Often* (7–9/10 times), and *Always* (10/10). We computed as a global measure of pro-environmental behavior the aggregate score of the 12 behaviors (α = .72, all items contributed to reliability).

We also conducted an exploratory (principal component) factor analysis with varimax rotation on the 12 items which suggested the existence of four factors with total variance explained being 55 % (see Table 1). All items had their highest loading in one factor and, except for two items, no second loadings to the other three factors were >.35. Based on the conceptual proximity of the different behaviors by factor, we labeled them as: (1) *Waste reduction* (waste sorting, recycling food, use of reusable bags); (2) *Unsustainable comfort reduction* (alternative to car transportation, buying clothes from pro-environmental firms, reducing meat consumption, use of no plastic recipients); (3) *Resource conservation* (water conservation, energy/battery conservation, economic lighting); and (4) *Costly behaviors*, i.e., using alternative transportation means (costly in time) to avoid flights and privileging local/organic products (typically more expensive). In addition to the global pro-environmental behavior score (α = .72), we also retained for further analyses the first three factors (their reliability was not inappropriate for three- or four-item constructs reflecting diverse behaviors; αs = .62, .51, and .57), but not the fourth one (near to zero reliability). The three factors tapped distinct types of behaviors that were only moderated inter-related, *rs* = .27 to .38, all *ps* < .001.

2.1.2.2. Pro-environmental identity. We measured self-identification as someone who is environmentally responsible and caring for the environment through the four items of the Pro-Environmental Self-Identity Scale (Whitmarsh a O'Neill, 2010) (6-point scales). Two items denote concern for self-perception, and the two others concern for perception by others. Sample items are: "I think of myself as someone who is very concerned with environmental issues", and "I would not want my family or friends to think of me as someone who is concerned about environmental issues" (reverse). We computed an aggregate score of the four items (α = .72), as well as two distinct scores, one for self-perception and another for perception by others, (αs = .84 and .82). The two were only moderately interrelated, *r* = .32, *p* < .001.

2.1.2.3. Collective identities and authenticity. We measured *global/universalistic* and *local collective identities* through three items of the questionnaire of the World Values Survey Wave 6 (2012) where participants mention the degree of their self-identification with the world, own country, and own region. The two later items were well inter-related, *r* = .57, and negatively related to the world identity (−.09, −.18). We thus computed an aggregate score of local identity, by averaging the scores in the national and regional identities (α = .69). *Authenticity* was measured through the eight items of the Authentic living and the Self-alienation facets of the Authenticity Scale (Wood et al., 2008) (α = 77). Sample items are: "I think it is better to be yourself, than to be popular" and "I feel out of touch with the 'real me'" (reverse). We did not include the items of the third facet, i.e., Accepting external influence, since this construct is conceptually far from the other two and less relevant for our work.

2.1.2.4. Awe, generativity, and values of self-enhancement. We measured participants' propensity to experience the emotion of *awe* in their life frequently and largely, across situations, through the six-item Awe subscale of the Dispositional Positive Emotions Scale (Shiota et al., 2006). Sample items are: "I see beauty all around me" and "I feel wonder almost every day" (α = 82). We also administered the six-item Social Generativity Scale (Morselli & Passini, 2015) that measures *generativity* as in Erikson's theory, i.e., the concern to create or nurture things that will outlast oneself, but with an emphasis on the social dimension of generativity as social responsibility and care for future generations. Sample items are: "I have a personal responsibility to improve the area in which I live" and "I give up part of my daily comforts to foster the development of next generations" (α = .82). Finally, *power* and *achievement* in Schwartz's model of values compose the pole of values denoting *self-enhancement*. We measured these two values through six, three and three, items (6-point Likert scales) from the Portrait Value Questionnaire-Revised (Schwartz & Cieciuch, 2021). Sample items are: "It is important to this person to have the power that money can bring" (power) and "It is important for this person to be ambitious" (achievement). Reliability of the six items was high (α = .84) and since the two values were highly interrelated (*r* = .81), we aggregated the score of the six items to compose a global measure of valuing self-enhancement.

2.1.2.5. Openness-intellect. To measure a person's tendency to engage with and process abstract, rich, and complex information, we administered four of the ten items of Intellect, one of the two subdomains of the Openness/Intellect factor in the *Big Five Aspects Scales* (DeYoung et al., 2007 (5-point Likert scales). Sample items are: "I can handle a lot of information" and "I have difficulty understanding abstract ideas" (reverse). Intellect, rather than the other subdomain of the fifth factor (experiential openness), relates to general intelligence and nonverbal intelligence (DeYoung et al., 2013). Reliability was satisfactory (α = .61).

2.1.2.6. Religiousness. We measured *common religiosity* through two widely used (e.g., in the World Values Survey) items, where participants rate (1) the importance of God in their own life and (2) and the importance of religion in their life (α = .97). The two questions reflect intrinsic religiosity (Saroglou & Mathijsen, 2007). We also measured *spirituality* through a similar widely used item asking participants to rate

Table 1
Factor analysis of pro-environmental behaviors (Study 1).

	Factor 1	Factor 11	Factor III	Factor IV
Behaviors	Waste reduction	Unsust. comfort reduction	Resource conservation	Costly behaviors
Food recycling	**.75**	.02	.08	.05
Waste sorting	**.73**	.04	.19	.02
Reusable bags	**.65**	.10	.11	−.14
Low/no meat	−.09	**.65**	.18	−.05
Alternative to car transport	.11	**.64**	−.17	−.12
Responsible clothing	.12	**.62**	.24	.32
No plastic recipients	**.41**	**.48**	.14	.13
Water saving	.20	−.07	**.81**	−.03
Energy saving (appliances)	−.01	**.36**	**.63**	−.02
Eco light bulbs	.32	−.09	**.62**	.10
Avoid airplane	.26	.19	.12	**−.71**
Local organic food	.30	.33	.18	**.67**

Note. *N* = 342. Loadings >.35 are in bold.

the importance of spirituality in their life. These indexes typically provide results similar to those obtained through multi-item measures, especially in secularized countries with high rates of non-believers (Saroglou et al., 2020). Though inter-related (r in the present data = .75), these measures often predict partly distinct outcomes (e.g., Saroglou, Clobert, et al., 2020; Saroglou & Muñoz-García, 2008).

Religious fundamentalism was measured through the following items: "Whenever science and religion conflict, religion is always right", "The only acceptable religion is my religion", "All religions should be taught in our public schools", "People who belong to different religions are probably just as moral as those who belong to mine" (reverse) (World Values Survey, 2012); "Scriptures may contain general truths, but they should not be considered completely, literally true from beginning to end" (reverse); and "There are religious teachings that were given to us directly by God; no truth is deeper than these teachings" (Religious Fundamentalism Scale-Revised; Altemeyer & Hunsberger, 2004). The reliability increased to .89 if the third and fourth items (possibly ambiguous: in a very secularized country, religious absolutists may perceive atheists, but not other religionists, as immoral, and may want religions in general to be taught in public schools) were not included. We thus computed a composite score of the other four items.

2.1.2.7. Political orientation and socio-demographics. We measured political orientation through the World Values Survey question "In political matters, people talk of 'the left' and 'the right.' How would you place your views on this scale, generally speaking?" (answers range from 1-*left* to 10-*right*). In addition to age and gender, participants provided information on education level (we coded the answers in a 3-point Likert scale: 1-secondary education, 2-high school, 3-University) and income, in a 4-point Likert scale varying from 1 (<1000 €) to 4 (>3500 €). We also measured math competence, apocalyptic beliefs, and anti-scientism, but they were unrelated to pro-environmental constructs, though related to religious forms, and thus we do not report here results, not to extend the manuscript's length (but see Supplemental Material Appendix).

2.2. Results

In all pro-environmental constructs, the mean was above the median, i.e., >3.5 for pro-environmental identity and >3 for pro-environmental behavior (see Table 2 for descriptive statistics and intercorrelations). Pro-environmental identity, global and for self, were importantly related to global pro-environmental behavior (rs = .59, .62), whereas pro-environmental identity for others was only moderately related to identity for self and global pro-environmental behavior (rs = .32 and .36). Descriptive statistics of the other variables of the study are detailed in Table 3. Exploration of the data indicated few outliers for few variables. The analyses below do not include these outliers, but results were similar if the outliers were included.

Table 2
Descriptive statistics of pro-environmental constructs and intercorrelations (Study 1).

	M (SD)	2	3	4	5	6	7
1 Pro-environmental identity	4.25 (0.83)	.75	.87	.59	**.39**	.51	**.36**
2 For self	4.47 (0.84)		**.32**	.62	.44	.48	.43
3 For others	4.03 (1.18)			**.36**	**.21**	**.36**	**.18**
4 Pro-environmental behaviors	3.46 (0.55)				.70	.75	.74
5 Waste reduction	4.02 (0.80)					**.27**	**.38**
6 No unsustainable comfort	3.12 (0.76)						**.33**
7 Resource conservation	3.44 (0.90)						–

Note. N = 342. All correlation coefficients are significant at p < .001. Coefficients <.40 are in bold.

2.2.1. Correlates and predictors of pro-environmental identity and behavior

Correlations between pro-environmental identity and behaviors and the other variables are presented in Table 3. All seven or at least five out of the seven pro-environmental constructs were positively related to awe, generativity, authenticity, and intellect, and negatively related to self-enhancement (power/achievement), religiosity, fundamentalism, and right-wing political orientation. Both world citizen identity and local identity were positively related to pro-environmental identity, but also to pro-environmental behaviors (total) and waste reduction, in particular.

Spirituality, which in a sample including many nonbelievers was strongly related to religiosity (.75), was, unlike religiosity, unrelated to pro-environmental identity, but like religiosity, though in a weaker way, negatively related to pro-environmental behavior (total) and resource conservation. Nevertheless, when controlling for religiosity in partial correlations, spirituality turned out to be positively related to pro-environmental identity (total, and for self) and unsustainable consumption reduction. Note also that the negative links of religiosity and fundamentalism were higher for pro-environmental behavior than pro-environmental identity (total), zs = 1.47, 1.49, ps = .07, and pro-environmental identity for self, zs = 2.82, 2.20, ps = .002 and .006, whereas no such discrepancy was observed for spirituality (in partial correlations).

Several of the above significant correlates of the pro-environmental constructs were interrelated with each other, though weakly or moderately (Supplementary Material Table S2). World citizen identity, awe, generativity, authenticity, and intellect were intercorrelated, rs varying from .19 to .30. Most of those constructs were negatively related to self-enhancement and right-wing political orientation, rs varying from −.12 to −.19, the latter two being interrelated with each other (.23). Finally, the two collective identities were weakly positively interrelated.

We subsequently computed two multiple hierarchical regression analyses, one for pro-environmental identity (total) and the other for pro-environmental behavior (total). Each time, we included as predictors world citizen, local identity, awe, generativity, authenticity, self-enhancement, intellect, and religiosity (Step 1), and in addition political orientation, age, gender, education level, and income (Step 2). To avoid multicollinearity's risks, we did not include spirituality and fundamentalism given the high interrelations of these variables with religiosity.

As detailed in Table 4, both pro-environmental identity and behavior were predicted (last step), uniquely and additively, by low religiosity, higher intellect, and older age. Pro-environmental identity, but not behavior, was in addition predicted by awe, left-wing political orientation, and non-high income. Pro-environmental behavior, but not identity, was in addition predicted by other-oriented, not self-centered, dispositions, i.e., high generativity and low self-enhancement (power/achievement). Beyond these effects, there was no longer unique role of collective identities, authenticity, gender, and education.

2.2.2. Understanding the role of religion and spirituality

The regressions revealed a unique role of religiosity in predicting pro-environmental identity and behavior, beyond the effect of other-oriented dispositions (awe, generativity), values denoting self-enhancement (power/achievement), intellectual openness, and political orientation. Nevertheless, some part of the non-unique role of religiousness, in particular the one of specific religious forms, may be explained by certain individual differences associated to these forms.

2.2.2.1. Mediations of fundamentalism's and spirituality's effects. Religiosity, fundamentalism, and spirituality were often related with the other individual differences (see Supplementary Material Table S3). For spirituality, we also computed partial correlations, controlling for religiosity. All forms of religiousness were positively related to generativity and negatively related to the local identity. No associations were found

Table 3
Descriptive statistics and correlations of the hypothesized correlates with pro-environmental constructs (Study 1).

Correlates	*M (SD)*	Identity			Behavior			
		Total	for self	for others	Total	Waste reduction	Comfort reduction	Resource conserv.
World citizen	5.09 (1.60)	.17***	.14*	.15**	.13*	.14**	.07	.10
Local identity	4.81 (1.62)	.13*	.10	.11*	.15**	.22***	.04	.07
Awe	5.01 (1.03)	.30***	.30***	.21***	.29***	.18***	.25***	.19***
Generativity	5.00 (0.95)	.16**	.28***	.03	.22***	.10	.21***	.16**
Authenticity	5.58 (0.90)	.17**	.12*	.15**	.17***	.13*	.11*	.18***
Power/achievement	2.87 (0.99)	−.15**	−.16**	−.10	−.30***	−.25***	−.19***	−.20***
Openness: Intellect	3.72 (0.66)	.27***	.24***	.20***	.28***	.20***	.20***	.26***
Religiosity	3.99 (2.53)	−.20***	−.14**	−.18***	−.27***	−.20***	−.16**	−.17***
Spirituality	4.91 (2.20)	−.07	−.02	−.09	−.14**	−.10	−.04	−.12*
contr. f. religiosity		.12*	.13*	.07	.10	.08	.12*	.01
R. fundamentalism	3.10 (1.88)	−.24***	−.21***	−.19***	−.31***	−.21***	−.18***	−.23***
Polit. orient. (right)	4.20 (1.81)	−.31***	−.26***	−.25***	−.21***	−.14*	−.32***	.01

Note. $N = 342$.
***$p < .001$. **$p < .01$. *$p < .05$.

Table 4
Multiple hierarchical regressions of pro-environmental identity and behavior on the significant correlates (Study 1).

	Pro-environmental identity			Pro-environmental behavior		
	Step 1	Step 2	95 % CI	Step 1	Step 2	95 % CI
World citizen	.06	.06	*[−.03, .08]*	−.01	−.00	*[−.04, .03]*
Local identity	.07	.07	*[−.02, .09]*	.02	.01	*[−.03, .04]*
Awe	.21***	.17**	[.04, .22]	.11	.10	*[−.01, .11]*
Generativity	.09	.05	*[−.06, .14]*	.18**	.15*	[.02, .15]
Authenticity	.03	.04	*[−.06, .14]*	.04	.03	*[−.05, .08]*
Power/Achievement	−.11*	−.02	*[−.11, .08]*	−.22***	−.15*	[−.14, −.02]
Openness: Intellect	.11	.13*	[.02, .31]	.16*	.18**	[.05, .24]
Religiosity	−.19***	−.18**	[−.09, −.02]	−.29***	−.28***	[−.08, −.04]
Polit. orient. (right)		−.22***	[−.15, −.05]		−.06	*[−.05, .01]*
Age		.15*	[.00, .02]		.17**	[.00, .01]
Gender (women)		.05	*[−.12, .32]*		.08	*[−.03, .26]*
Education		.05	*[−.06, .17]*		.04	*[−.05, .10]*
Income		−.13*	[−.19, −.01]		−.11	*[−.11, .00]*

Note. $R^2 = .20$ and .27, for pro-environmental identity, and .29 and .32, for pro-environmental behavior, respectively in Steps 1 and 2. In italics: CI including zero.
***$p < .001$. **$p < .01$. *$p < .05$.

with authenticity and political orientation. However, spirituality (partial correlations) was positively related to world citizen identity, intellect, and awe (*rs* = .16, .14, 34), whereas fundamentalism was associated with low awe and highly valuing self-enhancement (−.12, .13), with religiosity doing the same with self-enhancement (.13).

A clear contrast between spirituality and fundamentalism emerged from these findings. Subsequently, we considered those variables that were significantly related to both pro-environmental behavior and fundamentalism or spirituality. We computed two multiple (parallel) mediation analyses using the SPSS PROCESS macro (Hayes, 2013), one with fundamentalism and the other with spirituality as predictor of pro-environmental behavior. For fundamentalism, we included, as mediators, local identity, awe, intellect, and self-enhancement. For spirituality, we included, as mediators, world citizen identity, awe, intellect, and generativity, and we also included religiosity as covariate, to control for its confounding role on spirituality's effect. The indirect effects of fundamentalism or spirituality on pro-environmental behavior via the respective mediators were estimated using a bootstrapping approach ($N = 5000$).

Fig. 1-top and 1-bottom report the standardized coefficients for all arrows. As regards the first figure, awe, $b = -.02$, $SE = .01$, 95 % CI = [−.049, −.001], and power/achievement, $b = -.03$, $SE = .02$, 95 % *CI* = [−.069, −.006], significantly mediated fundamentalism's effect on low pro-environmental behavior. The indirect effects of intellect and local identity were not significant. The total indirect effect was significant, $b = -.08$, $SE = .02$, 95 % CI = [−.131, −.037].

As regards spirituality (Fig. 1-bottom), with religiosity being a covariate, high awe, $b = .07$, $SE = .03$, 95 % CI = [.010, .127], generativity, $b = .08$, $SE = .02$, 95 % CI = [.036, .136], and intellect, $b = .03$, $SE = .02$, 95 % CI [.003, .069], each significantly mediated spirituality's effect on pro-environmental behavior. The indirect effect of world citizen identity was not significant. The total indirect total effect was significant, $b = .18$, $SE = .04$, 95 % CI = [.107, .268].

2.2.2.2. Comparisons between the religious/convictional groups. Participants were mostly composed of three convictional groups, i.e., Christians ($N = 78$), Muslims ($N = 113$), and nonreligious, i.e., agnostics and atheists ($N = 113$). We first compared the three groups on pro-environmental identity and behavior (see descriptive statistics in Table 5; see also Fig. 2). One-way Anova analysis conformed between-group differences on pro-environmental identity and behavior, *Fs*(2, 303) = 8.88 and 16.25, *ps* < .001, η^2s = .55 and .97. Repeating the same analyses, but controlling for age, gender, education, and income did not change these results, *Fs*(2, 276) = 7.47, and 19.56, *ps* < .001. Post-hoc comparisons (Bonferoni tests) showed that the significant differences were the ones between Muslim and nonbeliever participants, with mean differences varying from −.32, $p = .004$, to −.57, $p < .001$, *ds* = .77 and .52. Christian participants were located midway between Muslims and nonbelievers; they scored higher than Muslims on pro-environmental behavior (total), .25, $p = .003$, and resource conservation, .31, $p = .053$, *ds* = .54 and .91.

Therefore, part of the variance behind the negative association between religiosity or fundamentalism and pro-environmental constructs may be due to between-group differences on both pro-environmental dispositions and religiousness. Indeed, Muslim participants were the highest on religiosity, spirituality, and fundamentalism (*Ms* = 6.71,

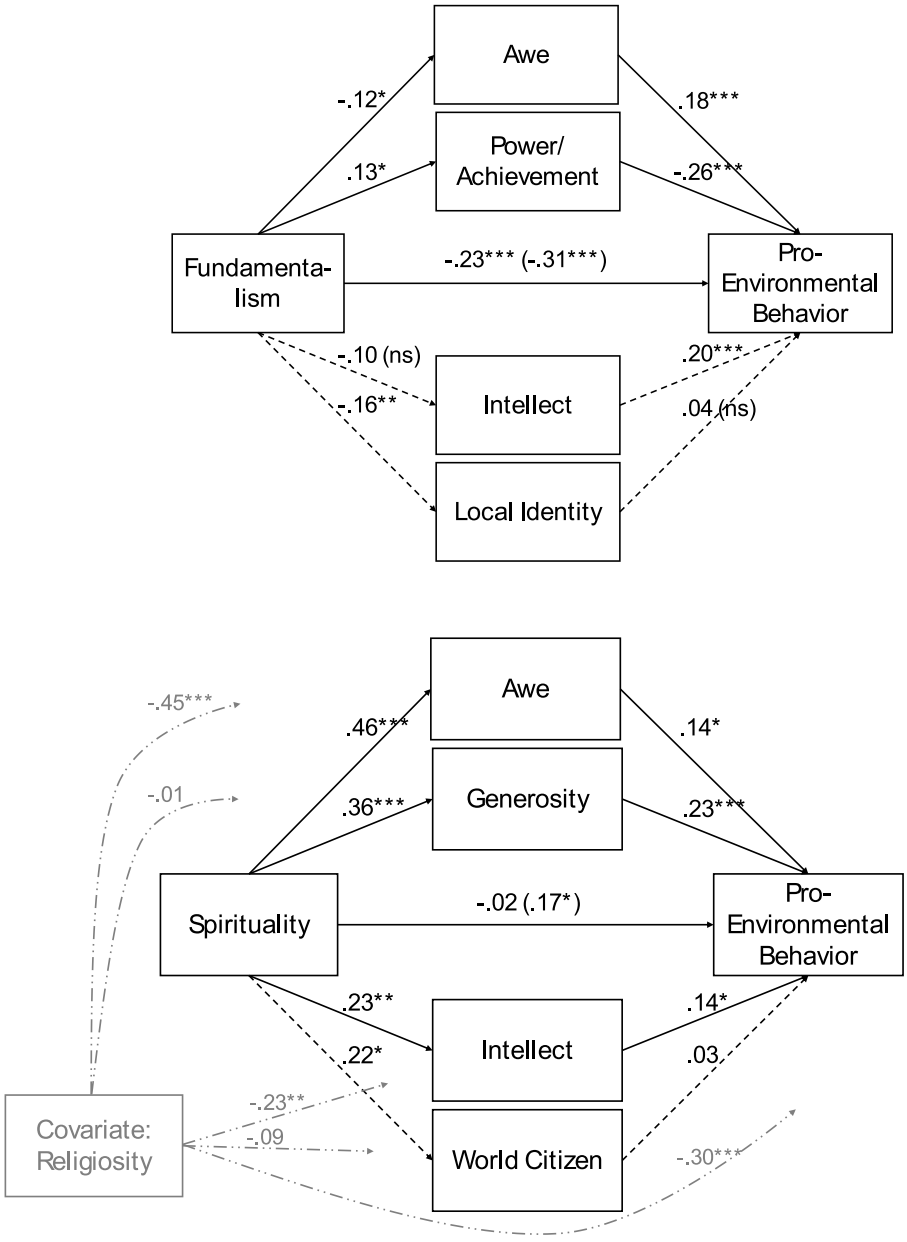

Fig. 1. Mediations of fundamentalism's (top) and spirituality's (bottom) effect on pro-environmental behavior (Study 1)
Note. All coefficients were standardized, and coefficients for total effects are in parentheses. Dot lines (in black) represent non-significant mediations.***$p < .001$. **$p < .01$. *$p < .05$.

6.63, 4,60, *SDs* = 0.73, 0.90, 1.16), followed by Christians (*Ms* = 4.13, 4.84, 2,50, *SDs* = 1.84, 1.80, 1.02), with the nonbelievers being the lowest (*Ms* = 1.27, 2.97, 1,83, *SDs* = 0.62, 1.94, 0.60); all *Fs* and post-hoc comparisons were significant at $p < .001$.

Subsequently, we computed correlations of pro-environmental identity and behavior with religiosity, fundamentalism, and spirituality, distinctly for Christians and Muslims. Similar correlations only among nonbelievers would not be meaningful, but we computed the same correlations in the larger sample composed by both Christians and nonbelievers, the later presumably having been socialized in a Christian cultural context (this also increases the *N* that is low for Christians alone). As detailed in Table 5, among Christians, fundamentalism was negatively related to both pro-environmental identity and behavior; and religiosity was negatively related to pro-environmental behavior (in a weaker way), significantly in the larger sample of Christians and nonbelievers. Among Muslims, spirituality was positively related to pro-environmental identity and behavior.

2.3. Discussion

Study 1 showed that, in a very secularized Western European society, common religiosity, i.e., not necessarily fundamentalist religion, predicts low pro-environmental identity and behavior. It does so in a unique way, beyond the role of other relevant for pro-environmentalism individual differences, i.e., collective identities, intellectual openness, dispositional awe, authenticity, and other- vs. self-oriented dispositions (social generativity vs. self-enhancement through power and achievement), and with sociodemographic variables (age, gender, education, income, and political orientation) being controlled for. Moreover, religiosity's negative role on pro-environmentalism was not an artefact of between-convictional group differences (Muslim participants, the most religious, were also the least pro-environmentally engaged, with nonbelievers being the most engaged—Christians were located midway): the negative religiosity-pro-environmental behavior association was also observed among the non-Muslims, i.e., Christians and nonbelievers

Table 5
Descriptives statistics and correlations of pro-environmental identity and behavior with forms of religiousness, by convictional group (Study 1).

	M (SD)	Religiosity	Fundamentalism	Spirituality
		r		
Christians ($N = 82$)				
Pro-environ. identity	4.19 (0.92)	.04	−.26**	.10
Pro-environ. behavior	3.47 (0.53)	−.14	−.28**	.02
Muslims ($N = 113$)				
Pro-environ. identity	3.98 (0.81)	.03	.11	.16†
Pro-environ. behavior	3.22 (0.54)	.06	.05	.19*
Nonbelievers ($N = 113$)				
Pro-environ. identity	4.44 (0.73)	–	–	.07
Pro-environ. behavior	4.61 (0.73)	–	–	.01
Christians and Nonbelievers ($N = 195$)				
Pro-environ. identity		−.08	−.24***	.01
Pro-environ. behavior		−.16*	−.26***	−.05

[a] *** $p < .001$. ** $p < .01$. * $p < .05$. † $p < .10$.

taken together. Furthermore, the role of religiosity and other individual differences seemed mostly similar across the three types of pro-environmental behaviors, i.e., waste reduction, unsustainable comfort reduction, and resource conservation.

In addition, this study showed that the negative role of religiosity was stronger regarding pro-environmental behavior compared to self-perception—and need for other-perception—as being someone who is pro-environmentally concerned. This indicates a possible role of social and religious desirability in religious people's self-perceptions, especially in a society where pro-environmental concerns are socially normative and valued in religious leaders' explicit discourse. The attitude-behavior discrepancy found here (see also Eom, Saad, & Kim, 2021) suggests a need for prudence when considering findings from studies showing positive associations between religiosity and pro-environmentalism assessed exclusively through self-reported attitudinal measures.

Finally, Study 1, replicating and extending previous research (Preston & Shin, 2022), confirmed the opposite role of fundamentalism and spirituality in predicting, respectively, low versus high pro-environmental dispositions, here behavior. We found that, to detect the role of spirituality in a secular country implying high proportion of nonbelievers in the study's sample, researchers may need to partialize out the overlapping religiosity. In addition, Study 1 showed that fundamentalism is an obstacle to pro-environmental behavior partly because of low interest in admiring the world (low awe) and highly valuing power and self-enhancing individual achievement. Spirituality, on the contrary, disconnected from traditional religiosity, sustains pro-environmental behavior through cognitive, emotional, and social openness: intellectual openness, disposition to experience awe, and social generativity. Of interest to note that, given that in the study country the religion vs. organized secularism divide transcends all political parties, from the right to the left, religious forms were unrelated to political orientation, preventing us to consider (see Preston & Shin, 2022) right-wing orientation as explaining fundamentalism's effect.

3. Study 2

Study 2 aimed to extend in the broader context of 33 Western European countries the major trends of Study 1 on the role of religion and spirituality in pro-environmental attitudes, the uniqueness of this role beyond the one of relevant psychological variables, and the mediational role of some of the latter. This large context also allowed us to investigate cross-cultural generalizability of the major trends across European countries of diverse religious heritage.

3.1. Method

3.1.1. Participants and religious-cultural zones

We used the data of the European Values Survey, fifth wave of 2017 (EVS, 2020), covering countries from all regions, i.e., Northern, Western, Eastern, Central, and Southern Europe. Following Inglehart and Welzel's (2023) World Civilizational Map, we considered four broad religious-cultural civilizational zones. These included: (1) nine countries of Protestant heritage (Denmark, Finland, Iceland, Norway, Sweden—of uniquely Protestant heritage, Great Britain, of Anglican heritage, and Germany, Switzerland, and the Netherlands of common Protestant and Catholic heritage); (2) 12 countries of Catholic heritage (Austria, Croatia, Czech Republic, France, Hungary, Italy, Lithuania, Poland, Portugal, Slovakia, Slovenia, and Spain), (3) nine countries of Christian Orthodox heritage (Armenia, Belarus, Bulgaria, Georgia, Montenegro, North Macedonia, Romania, Russia, and Serbia), and (4) three countries

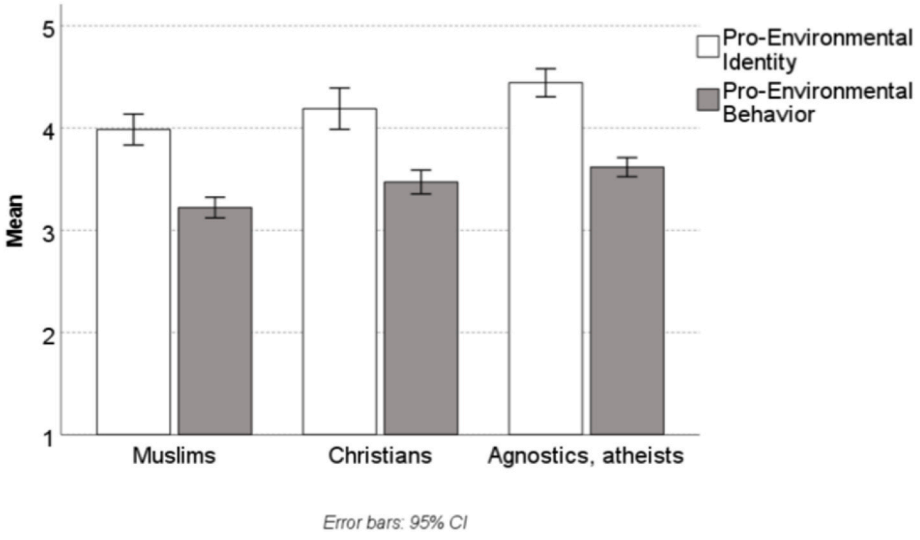

Fig. 2. Means of pro-environmental identity and behavior by convictional group (Study 1)
Note. The range of values for pro-environmental identity and behavior is, respectively, 1–6 and 1–5.

of Muslim heritage (Albania, Azerbaijan, and Bosnia and Herzegovina). In total, the data included 55.187 participants from 33 countries. The data are balanced in terms of participants' age (mean age = 49.66, *SD* = 17.72) and gender (55 % women). Ethical approvals were obtained for the collection of European EVS data and participants provided their informed consent prior to completing the survey. The data and questionnaire are publicly available at https://search.gesis.org/research_data/ZA7500.

3.1.2. Measures

3.1.2.1. Spirituality, religion, and nonbelief. The EVS includes continuous measures of religiosity but not of spirituality. Therefore, we used a classic EVS question where participants are requested to choose one of four options in answering the question "Which of these statements is closest to your beliefs?: (1) There is a personal God, (2) There is some kind of spirit or life force, (3) I don't really know what to think, or (4) I don't really think there is any kind of spirit, God, or life force". Almost all participants can thus be considered in the analyses, classified into four convictional groups, i.e., respectively, being (1) *religionist*, (2) *spiritual* (but not religious), (3) *agnostic*, or (4) *atheist*. In that way also, spirituality's effect can be investigated without the need for partializing religiosity. We considered for the analyses these four convictional groups, with respective *Ns* = 21.253, 17.850, 7.141, and 7.166 (total *N* = 53.410). The percentages of religious, spiritual, agnostic, and atheist participants, distinctly by religious-cultural zone, are shown in Fig. 3.

3.1.2.2. Pro-environmental attitudes. We aggregated the respective scores, after reversing the scores where appropriate, on five relevant questions of the EVS questionnaire (5-point Likert scales): "I would give part of my income if I were certain that the money would be used to prevent environmental pollution"; "It is just too difficult for someone like me to do much about the environment"; "There are more important things to do in life than protect the environment"; "There is no point in doing what I can for the environment unless others do the same", and "Many of the claims about environmental threats are exaggerated" (α = .68).

3.1.2.3. Hypothesized correlates/mediators and control variables. Considering the available questions in the EVS questionnaire, we selected three variables relevant for regression and mediation analyses in line with the ones as in Study 1. These included care for others (a prosocial dimension of generativity), performance orientation (a work-oriented aspect of generativity), and global (non-local) identity.

We measured *care for others* through three EVS questions: "To what extent do you feel concerned about the living conditions of the following groups living in your country? (1) old people, (2) unemployed people, and (3) sick and disabled people" (5-point Likert scales; α = .82). We did not include the fourth group (immigrants) mentioned in this EVS question since this could be a confound with high vs. low universalistic orientation. We measured *performance orientation* through three EWS questions: "Here are some aspects of a job that people say are important. Please look at them and tell me which ones you personally think are important in a job? (1) An opportunity to use initiative, (2) A job in which you feel you can achieve something, and (3) A responsible job" (α = .62, yes/no answers). We finally aggregated the two identities as world citizen and as European ("People have different views about themselves and how they relate to the world. Would you tell me how close do you feel to … (1) Europe, (2) world")? to dispose of an indicator of *global identity* (4-point Likert scales; α = .81). Finally, ss control variables, like in Study 1, we included, as measured in the EVS, political orientation (10-point scale form 1-left to 10-right), age, gender, education level, and income.

3.2. Results

Means and standard deviations of all measures, by religious-cultural zone, are detailed in Supplementary Material Table S4. Mean pro-environmental attitudes differed between religious-cultural zones, F = 911.99, η^2 = .046 (controlling for age, gender, education, income, political orientation, and religiosity). They were the highest in countries of Protestant heritage compared to the other zones (Bonferroni tests; mean differences from .27 to .46), followed by those with Catholic heritage still showing higher pro-environmental attitudes compared to countries of Orthodox and Muslim heritage (mean differences = .18 and .19, all *ps* < .001) (see also Fig. 4). This hierarchy strictly paralleled the one in the degree of secularity, with countries of Protestant heritage having the fewer percentage of religionists and the greater percentage of non-believers (agnostics and atheists), followed by countries of Catholic heritage, and with countries of Christian Orthodox and, even more, countries of Muslim heritage being composed by a majority of religionists, with nonbelievers being respectively less than 17 % and 11 % (see Fig. 3).

One-way Anova analysis by each religious-cultural zone revealed in all zones a significant effect of the convictional group on pro-environmental attitudes (see descriptive statistics, *Fs*, and $\eta^2 s$ in Table 6; see also Fig. 4). Post-hoc (Bonferroni) comparisons showed that, in all religious-cultural zones, spiritual people reported higher pro-environmental attitudes compared to the three other groups, all p < .001 (in Muslim countries, the contrast was significant between the spiritual and the religious). In addition, in countries of Protestant and Catholic heritage, atheists reported stronger pro-environmental

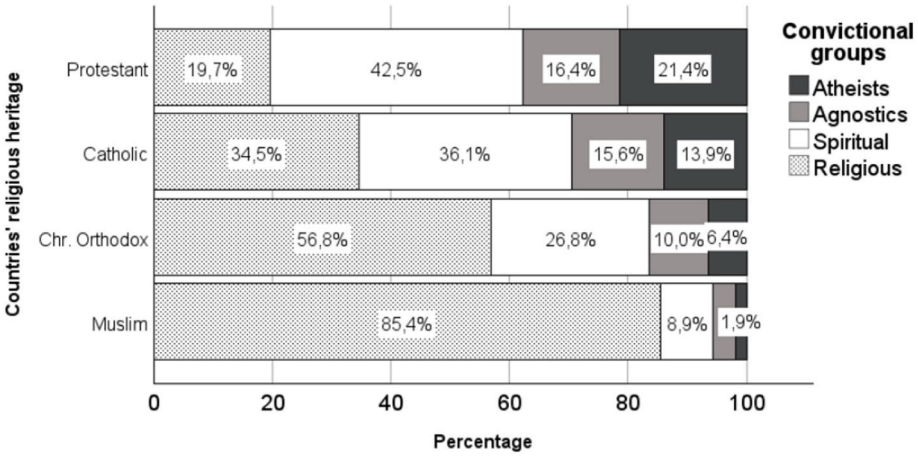

Fig. 3. Percentages of convictional groups, distinctly by European religious-cultural zone (Study 2).

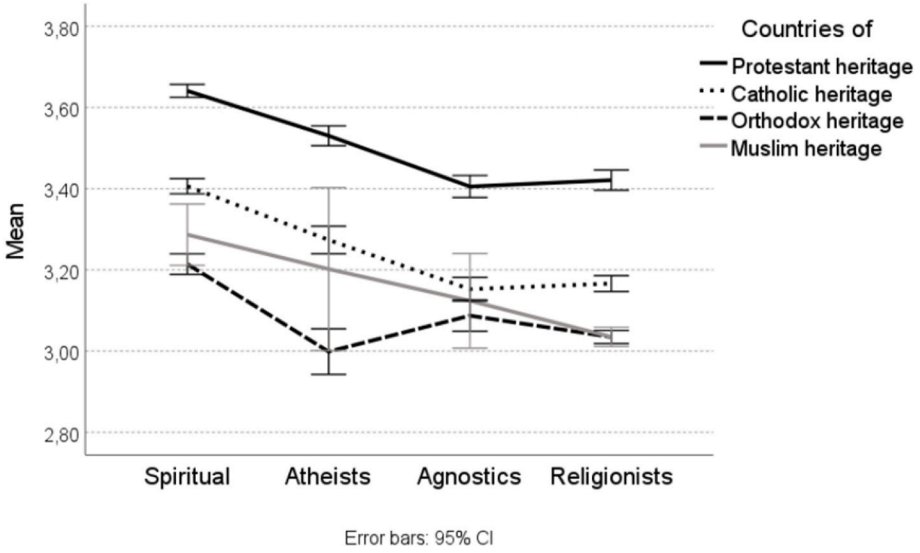

Fig. 4. Pro-environmental attitudes, by convictional group and by European religious-cultural zone (Study 2)
Note. The scale of axis y (from 1 to 5) is reduced to facilitate the visibility of mean differences.

Table 6
Descriptive statistics of pro-environmental attitudes, by convictional group and European religious-cultural zone (Study 2).

Countries of	Religious	Spiritual	Agnostics	Atheists	Comparisons	
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*F*	η^2
Protestant heritage	3.42 (0.74)	3.64 (0.70)	3.40 (0.75)	3.53 (0.76)	110.81***	.023
Catholic heritage	3.17 (0.77)	3.41 (0.77)	3.15 (0.77)	3.27 (0.85)	119.13***	.024
Orthodox heritage	3.03 (0.70)	3.21 (0.76)	3.09 (0.71)	3.00 (0.83)	52.23***	.016
Muslim heritage	3.03 (0.77)	3.29 (0.80)	3.12 (0.79)	3.20 (0.97)	15.09***	.015

Note. Ns for religionists, spiritual, agnostics, and atheists, are respectively: 3.450, 7.493, 2.882, and 3.772 (nine countries of Protestant heritage), 5.995, 6.307, 2.710, and 2.423 (12 countries of Catholic heritage), 7.428, 3.482, 1302, and 839 (nine countries of Orthodox heritage), and 4.127, 437, 177, and 93 (three countries of Muslim heritage).
***$p < .001$.

attitudes compared to religionists and agnostics, all *ps* < .001, and in the Orthodox countries atheists did similarly compared to agnostics, $p = .036$.

Pro-environmental attitudes were positively related to care (*rs* = .14, .14, .03, .14), global identity (.20, .16, .11, .04), and performance orientation (.17, .11, .12, .20), respectively in countries of Protestant, Catholic, Orthodox, and Muslim heritage, all *ps* < .001. Furthermore, spiritual people, compared to the other three groups together, were higher in care, *Fs* = 40.99, 25.16, performance orientation, *Fs* = 88.84, 35.53, and global identity, *Fs* = 22.65, 7.63, in countries of Protestant and Catholic heritage, all but the last $p < .001$. In Orthodox societies, this held for performance orientation and global identity, 49.86, 80.81, but not for care; and, in Muslim countries, spiritual people outperformed in global identity, 11.13; all *ps* < .001.

Subsequently we computed, distinctly by cultural zone, a hierarchical multiple regression analysis of pro-environmental attitudes on being spiritual, care, performance orientation, and global identity (Step 1), with the four sociodemographic variables and political orientation being added in Step 2. As seen in Table 7, in all four religious-cultural zones, all four predictors, including spirituality, had a unique and additive predictive role and this persisted after adding the control variables.

Finally, we computed a multiple simultaneous mediational analysis, distinctly for each religious-cultural zone, with care, performance orientation, and global identity as mediators of the spirituality-pro-environmental attitudes positive link, and with the five control variables as covariates (see Fig. 5). In countries of Protestant and Catholic heritage, the total indirect effect was significant, respective *bs* = .014, .014, *SEs* = .002, .002, 95 % CI = [.011, .018] and [.009, .018], as well as the indirect effects of care, *bs* = .004, .007, *SEs* = .001, .001, 95 % CI = [.002, .006] and [.005, .010], performance orientation, *bs* = .007, .004, *SEs* = .001, .001, 95 % CI = [.005, .009] and [.002, .005], and global identity in Protestant, but not Catholic, countries, *bs* = .003, .003, *SEs* = .001, .001, 95 % CI = [.001, .006], [−.000, .005]. In the countries of Orthodox and Muslim heritage, the total indirect effect was not significant.

3.3. Discussion

Study 2 provided cross-cultural generalizability of the main findings of Study 1 in the European continent. Across all cultural European zones, of various Christian and Muslim heritages, spiritual people reported the highest pro-environmental attitudes compared to religionists and non-believers; and spirituality's role was unique, additional to the role of care for others, performance orientation, and global identity. At least for societies of Western Christian heritage, which were also the most marked by pro-environmental concerns, with Protestant societies being the highest, the effect of spirituality was partly, though weakly, explained by spiritual people's higher prosociality, proactiveness in work, and universalistic identity—the two latter also explained spirituality's effect in Orthodox countries.

In line with and nuancing Study 1, atheists hold higher pro-environmental attitudes than religionists in countries of Protestant and Catholic heritage, which are also the ones highly marked by secularity and where religionists were a minority, compared to countries of Christian Orthodox and Muslim heritage, more religious on average

Table 7
Multiple hierarchical regressions of pro-environmental attitudes on the significant correlates, distinctly by European religious-cultural zone (Study 2).

	Step 1	Step 2	95 % CI	Step 1	Step 2	95 % CI
	Countries of Protestant heritage			Countries of Catholic heritage		
Spiritual	.10***	.08***	[.05, .07]	.11***	.10***	[.06, .09]
Care	.11***	.11***	[.09, .11]	.11***	.13***	[.12, .15]
Performance orient.	.13***	.11***	[.21, .27]	.08***	.06***	[.10, .18]
Universal. identity	.17***	.14***	[.13, .16]	.15***	.14***	[.13, .17]
Polit. orient. (right)		−.22***	[−.08, −.07]		−.08***	[−.03, −.02]
Age		−.10***	[−.01, −.00]		−.11***	[−.01, −.00]
Gender (women)		.10***	[.13, .17]		.02	[.01, .07]
Education		.01	*[−.00, .01]*		.05***	[.01, .03]
Income		.13***	[.10, .13]		.10***	[.08, .11]
	Countries of Orthodox heritage			Countries of Muslim heritage		
Spiritual	.11***	.10***	[.06, .10]	.09***	.09***	[.08, .17]
Care	.02*	.04***	[.01, .05]	.12***	.11***	[.07, .13]
Performance orient.	.08***	.07***	[.09, .18]	.18***	.18***	[.32, .47]
Universal. identity	.10***	.09***	[.06, .10]	.04*	.04*	[.01, .06]
Polit. orient. (right)		.01	*[−.01, .01]*		−.01	*[−.01, .01]*
Age		−.04**	[−.01, −.00]		.06***	[.00, .00]
Gender (women)		.06***	[.05, .12]		.07***	[.05, .16]
Education		.08***	[.07, .11]		.00	*[−.04, .05]*
Income		.09***	[.06, .10]		.03	*[−.01 .06]*

Note. R^2 = .28, .41 (countries of Protestant heritage), .26, .32 (countries of Catholic heritage), .18, .24 (countries of Christian Orthodox heritage), and .24, .26 (countries of Muslim heritage), respectively for Steps 1 and 2. The 95 % CI for the effect of being spiritual (Step 2) were [.049, .071], [.065, .094], [.065, .102], and [.079, .166], respectively for the four cultural zones. In italics: CI including zero.
***$p < .001$. **$p < .01$. *$p < .05$.

(European Commission, 2019) and where religionists were a majority. Nevertheless, agnostics did not follow atheists; they were similar to religionists. This finding suggests that, at least in secular societies, the religion-irreligion contrast on pro-environmentalism is not only due to religionists not favoring pro-environmental engagement, but also to conscious atheists who, unlike agnostics, are moved by their own values promoting concern and care for the environment.

Finally, to further document the position of secular Europe, of Christian heritage, within the spectrum of the many countries worldwide, we exploratorily computed, for each of the 92 countries of the joint EVS/WVS 2017–2022 (EVS/WVS, 2024) data, the correlations between individual religiosity (item: "importance of religion in life"; 5-point Likert) and pro-environmentalism (item of prioritizing 1-"protecting the environment" vs. 2-"economic growth and creating jobs") and also classified the 92 countries into religious-cultural zones, following Inglehart and Welzel (2023). A contrast emerged: in most European countries of Protestant and Catholic heritage, as well as in the Anglo-Saxon countries, the (weak) correlations were negative, whereas in most Asian and African countries, the (weak) correlations were positive. (The US showed the strongest negative correlation—it was even a statistical outlier = −.22, what may result from a strong polarization between nonbelievers and religionists on pro-environmental attitudes). Finally, the association between the above by-country correlations and country's percentage of religionists (EVS/WVS item "I am a religious person"), though weak, was positive and significant, Spearman's rho = .244, p = .019, 95 % CIs = [.035, .432], suggesting that the less a country is religious—or the more is secular, the religiosity-proenvironmentalism link decreases, indeed shifts from positive to negative.

4. General discussion

Discussions of Studies 1 and 2 provided a synthesis of the respective findings and underlined the specificity of these findings with respect to previous research. General Discussion aims to contribute with broader considerations and introduction of further questions.

Overall, this work showed that, in secularized cultural contexts of mostly Christian heritage like the European ones, nonbelievers, in particular atheists, outperform religionists on pro-environmental attitudes and behavior, but (non-traditionally religious) spiritual people seemed to be the most engaged in pro-environmentalism, even more than atheists. These trends are generalizable across European societies of different Christian heritages (Protestant, Catholic, Christian Orthodox) and seem to also apply to European Muslim contexts—societies and people, which are very likely under multiple influences, i.e., Islam, Christianity, and secularism.

The positive role of spirituality on pro-environmental commitment seems to be, at least partly, due to spirituality's *openness to others, nature, and the world* and/or related *proactiveness*, and this at various levels: *emotional*, i.e., admiration of the world and nature through awe; *cognitive*, i.e., intellectual engagement with complex elements; *social*, through care for others, social responsibility, and performance orientation; and *identitarian*, i.e., perceiving oneself as belonging to a broad human community transcending one's nation. These psychological trends exert

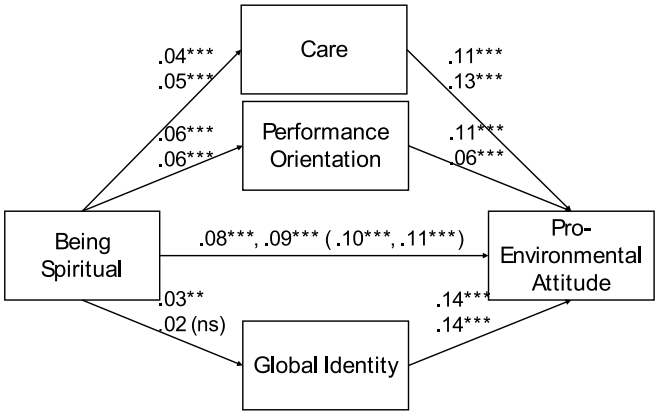

Fig. 5. Mediations of the effect of being Spiritual on pro-environmental attitudes, distinctly by European-cultural zone (Study 2)
Note. For countries of Protestant heritage (first number in each arrow) and Catholic heritage (second number): all coefficients are standardized, and coefficients for total effects are in parentheses. Age, gender, education, and income were included as covariates.

their own role and are not artefacts of people's education level and political gap between left-wing liberals and right-wing conservatives. At the contrary, people holding absolutist and literalist religious ideas, and perhaps simply endorsing a traditional, inertia-motivated religious orientation, are reluctant to be pro-environmentally engaged, partly because they tend to be self-centered (see the role found here of the self-enhancing values of power and individual success) and less happily and confidently admiring the world as a whole (see the role found here of low propensity to experience awe).

The findings of the present work also advance our cross-cultural understanding of the role religion, spirituality, and atheism may play on pro-environmental attitudes and behavior. First, the findings underlined the importance of considering the secular versus traditional/religious character of societies. As other research shows, the secular character of societies importantly moderates, and in some cases reverses, religiosity's psychological and social outcomes (Gebauer & Sedikides, 2021). It may thus be that, in traditional religious societies, religiosity and religious spirituality have a moral advantage compared to irreligion (Saroglou, 2019) and fit with collectivistic values sustaining care for the environment (Kaplan & Iyer, 2021). In secularized countries, non-religious sources of meaning and social engagement such as atheism and non-religious spirituality may, outperform on pro-environmentalism traditional religion's tendency, known to generally favor the status quo (Jost et al., 2014; Saroglou, 2023).

Second, important similarities were observed between Christian (Catholic) and Muslim participants in a secularized European country (Study 1) and between European countries of Protestant, Catholic, Christian Orthodox, and Muslim heritages (Study 2). The contrast between traditional religiosity/fundamentalism and spirituality in predicting respectively low versus high pro-environmental concern, and the role of social generativity and feeling of oneness with the world in partly explaining spirituality's effect, were present across various religious contexts. Finally, beyond these similarities, mean differences between religious cultures persist: Christian Catholics were more pro-environmentally behaving than their Muslim compatriots (Study 1) and Protestant cultures are more pro-environmentalism-friendly than Catholic ones, with Christian Orthodox and Muslim cultures being even lower (Study 2). These mean differences were not an artefact of socio-demographic differences, suggesting real differences between religious cultures. Future research could investigate whether, behind differences between "religious cultures", we should consider differences in theologies, contemporary religious discourses, environmental knowledge and awareness, or broad socialization experiences.

What motivates atheists to be more pro-environmentally engaged than traditional religionists? The question is meaningful since Study 2 showed that in Western and Central Europe, i.e., countries of Protestant and Catholic heritage, agnostics were like religionists rather than atheists on pro-environmental attitudes. One possibility is that, in these countries, as for other societal and moral issues (e.g., women-men equality, minorities' rights, State-Church separation, divorce, abortion, euthanasia), organized atheism has been proactive in promoting and implementing broad societal changes. These have been motivated by values of individual autonomy, emancipation from religious authority, and citizen responsibility. At least today, these values transcend, in these European societies, political polarization between the left and the right, unlike what happens in the US. A second possibility could be atheists' high valorization of science and trust of scientific information on environment. Nevertheless, additional analyses in Study 1 (see Supplemental Material Appendix) suggest that pro-environmentalism among atheists may also be motivated by the belief that science is not the source of a superior or absolute truth about reality—what possibly favors the value of citizen responsibility.

The present work has certain limitations. First, pro-environmental attitudes were measured only through few items (Studies 1 and 2). Pro-environmental behavior (Study 1) was measured through multiple items and with indication of specific behavior frequencies (Lange & Dewitte, 2019), but was self-reported, what is a meaningful but not an optimal indicator of real pro-environmental behavior (Kormos & Gifford, 2014). Given societal pressure to appear as pro-environmentally responsible in European societies and the religion-self-enhancement established association (Sedikides & Gebauer, 2021), this question needs further clarification in future research. Second, religiosity and spirituality were measured through single- or few-item indexes. This is justifiable (see Method section in Study 1), but additional information may be provided if future studies use broader measures. Moreover, men were underrepresented in Study 1. Though Study 1's findings were convergent with the ones of Study 2 disposing of gender balance, additional psychological variables may contribute to explain fundamentalism's and spirituality's effects on pro-environmentalism if more men are included. Furthermore, the mediators in Study 2 explained only a thin part of the variance leaving thus open the question for future research whether broader measures may provide more substantial effect sizes and/or whether other mediators may turn out to show more important effects.

Finally, secular vs. traditional religious countries are most often ones marked by (Western) Christianity vs. other religions (see also both Studies 1 and 2), and the most secular countries are marked by mainstream Protestantism (see also Study 2). This suggests some possible overlap between society's secularity and specific religious heritage. Nevertheless, the fact that atheists were higher in pro-environmentalism compared to agnostics (and not only to religionists), as well as the fact that the spiritual but non-religious were also higher than religionists (Study 2), indicate a specific influence of secular heritage in European societies.

5. Conclusion

Understanding the role of people's existential worldviews such as religion, spirituality, and nonbelief is of importance for knowing what motivates or undermines pro-environmental concern and behavior across societies. Focusing on secular societies allows for a specific, if not different, understanding of the above questions, compared to traditional cultural contexts. Going beyond a somehow dualistic perception of "good religion" promoting pro-environmentalism through "stewardship" and "bad" religion undermining pro-environmentalism through "dominion", this work showed that, at least in secular Europe, non-religious spiritual people first, and then conscious atheists, compared to traditional(ist) religionists are more concerned by and more caring for the environment. Cognitive, emotional, social, and identitarian openness to others and the world seems to accompany and partly explain the above dispositions.

CRediT authorship contribution statement

Vassilis Saroglou: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Kenza El Marsni:** Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Ilhem Benaicha:** Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

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Disclocure of conflicts of interest

The authors declare no conflict of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jenvp.2025.102799.

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