Transcendence and Sublime Experience in Nature: Awe and Inspiring Energy

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The wilderness is one of the most widely recognized sources of transcendent emotion. Various recent studies have demonstrated nature’s power to induce intense emotions. The study at hand will generate conceptual and operational definitions of sublime emotion toward nature. Taking into consideration the recent research on feelings of awe, an instrument is devised to measure sublime emotion toward nature. The proposed scale’s reliability and validity is tested in a sample of 280 participants from the general population of Madrid. Results show that sublime emotion was defined by two conceptual components: awe, and inspiring energy, both obtained using the computer program FACTOR. After reliability and validity analysis, the Sublime Emotion toward Nature (SEN) scale included 18 items, distributed into awe (6 items, \( \alpha = 0.881 \)) and inspiring energy (12 items, \( \alpha = 0.933 \)). Awe was defined by feelings of fear, threat, vulnerability, fragility, and respect for nature, which is perceived as vast, powerful, and mysterious. Inspiring energy was defined by feelings of vitality, joy, energy, oneness, freedom, eternity, and harmony with the universe. The SEN is an adequate instrument to measure transcendent emotions provoked by direct wilderness exposure or memory thereof.

Keywords: sublime, awe, inspiring energy, transcendent emotions, nature, operational definition

INTRODUCTION

In research on humans’ relationship to the natural world, spirituality is key to understanding people’s emotions and the meaning of nature to them (Fredrickson and Anderson, 1999). Stokols (1990) maintains that it is a central element of environmental experience. Spirituality can be defined as “an individual’s inner experience and/or belief system, that gives meaning to existence, and subsequently allows one to transcend beyond the present context,” in Kamitsis and Francis’s (2013, p. 137) words. In recent years, spirituality research has peaked in association with research on transcendent experiences (Levin and Steele, 2005; Yaden et al., 2017) in relation to wellbeing (Yaden et al., 2017), health (Levin and Steele, 2005), and other aspects. It has, further, opened up a specific line of research on feelings of awe, which researchers have undertaken experimentally (Piff et al., 2015) as well as phenomenologically (Bonner and Friedman, 2011), building on Keltner and Haidt (2003) pioneering contribution.

Various studies have examined what elicits this sort of transcendent emotion, as well as its effects. They all emphasize that nature is a principal source for people to “experience a sense of spirituality”
William James (1902/1986, 1890/1950) refers to spiritual identity as the important historical contributions from Psychological Science.

As a sense of oneness with all things, and he connects it to a mystic experience – a sort of spiritual, religious experience that is typically ineffable, true, transitory, passive, and brought about by a perceived higher power. Nature evokes these feelings because “it seems to have a peculiar power of awakening such mystical moods” (James, 1902/1986, p. 385). James adds that mystical experiences provoked by nature are cited in works of art, including and especially Walt Whitman’s poetry (James, 1902/1986), which conveys a sense of interconnectedness and oneness between the entire universe and the personal, private sphere.

Maslow (1964), too, studied human emotions related to self-transcendence and self-realization, in terms of his famous concept of peak experience. Emotional response during a peak experience is described as a constellation of intense feelings, associated with terms like “wonder, surprise, awe, amazement, reverence, humility and surrender before the experience as before something great” (Maslow, 1999, p.89). Self-perception transcends the self, and what emerges is a sense of oneness with the broader universe. Similarly, it is associated with positive emotions like self-realization, and impulses toward honesty and goodness.

A third point of conceptual support for investigating transcendent emotions is flow experience. Csikszentmihalyi (2014) defines this as a person entering a state of absorption, full attention, and abstraction in a personally fulfilling activity that brings him or her closer to a positive state – for instance, a state of utter joy, a sense of balance and self-sufficiency in life, etc. Seligman and Csikszentmihaly (2000) link flow experience to spirituality as a Positive Psychology tool to “move individuals toward better citizenship” (p. 5).

Mystical experience, peak experience, and flow are all psychological processes related to transcendent emotions (Yaden et al., 2017). Several studies offer empirical support that nature prompts transcendent emotional reactions. Talbot and Kaplan (1986) argue that wonder and awe are among people’s emotional reactions to direct contact with wilderness, along with a feeling of oneness with nature (see also Hartig and Evans, 1993).

Williams and Harvey (2001) conducted a study to discover types of transcendent emotions produced in the forest, in the state of Victoria in southeast Australia. Among others measures, they adapted the Hood (1975) mysticism scale to measure “the transcendent nature of the experience” (p. 251) and defined transcendent emotions in the forest as intense positive mood, unity, absorption, and timelessness. Through cluster analysis, they determined that transcendent emotion is defined by feeling small and insignificant while also experiencing deep flow. Feeling small is marked by a high level of fascination and novelty, low belonging, and feelings associated with awe, wonder, and humility toward the natural world. Meanwhile deep flow is defined by feelings of belonging and relaxation in the forest.

Seamon (1984) analyzes Wordsworth poems (1770–1850) from a phenomenological perspective, concluding that spiritual emotions denote a profound sense of belonging with nature and refer to positive, pleasant feelings like joy, exaltation and the sublime feeling in particular. He mentions a heightened emotion feeling, which he describes as a sense of inner peace that suspends the individual in a deep, inner spiritual state; hard
inspire horror and fear (storms and natural disasters, among
it is only provoked by positive, not negative, events that
awe is a more intimate expression than happiness, and that
exposure to art or music (20%). Those authors conclude that
et al. (2007) administered a survey of open-ended questions
relation to wellbeing and connectedness with nature. Shiota
relate to positive emotions, and recommend studying it in
(Y aden et al., 2016).

Awe has been defined as a positive – as well as complex –
emotion, and several recent studies have examined its effects.
It has a demonstrated impact on perception of one’s body (Van
Elk et al., 2016), and of time (Rudd et al., 2012). Additionally,
Piff et al. (2015) research has identified two effects of awe: diminishment of the individual self; and increased prosocial
behavior. Other studies have shown that awe has effects on
the genesis of spiritual intentions (Van Cappellen et al., 2013).
Hinds and Sparks (2008, 2011) investigations associate it with
Eudaimonia, a type of psychological wellbeing associated with
feelings of inner peace, happiness, vitality, and satisfaction
with life. Awe, considered a sort of affective state, loaded
onto the Eudaimonia factor along with other affective states –
emotional connection, contemplation, serenity, vitality, sense
of freedom, empathy, and freshness. Awe was related to being
(or remembering being) in the jungle, mountains, and large
valleys; and to a lesser extent being in the forest, river, ocean,
or at the beach.

Altogether, these studies highlight some of the most important
psychological benefits of awe. Yet as Bonner and Friedman (2011)
point out, “awe lacks a consensual and precise meaning” (p. 222).
It might be part of a broader concept of spiritual, transcendent
emotions (Ashley, 2007), the sublime experience toward nature,
as the present study proposes.

For better clarification, as Table 1 clearly conveys, sublime
emotion as described by Burke (1757/2005) and Bodei
(2008/2011) has a similar meaning to Maslow (1964) peak
experience, and sense of awe as defined by Kant (1764/2008),
Keltner and Haidt (2003), Haidt (2003), Shiota et al. (2007),
and Cousins et al. (2009). The definitions agree that awe, a
property proposed as part of the conception of sublime emotion,
is accompanied by an experience that overwhelms the self
and human understanding, triggering a devotional reaction.
Maslow (1964) goes further, arguing that these experiences and
emotions relate to other psychological variables, like intrinsic,
universal values that everyone and every culture have for
wilderness experience.

The aforementioned studies share an interest in transcendent
and spiritual emotions, highlighting the importance of one
in particular within the empirical literature: awe. However,
many authors have suggested (Bonner and Friedman, 2011,
among others) there is a need to precisely define the
content of this complex emotion. Moreover, we need to
institute measures of awe that can be compared. For example,
Joye and Bolderdijk (2015) maintain that:

We have probed for awe and awe related emotions by using
only one item. This underscores the need to develop a
validated scale –or any other measurement instrument– that
is capable of accurately capturing the occurrence of this
complex emotional state, and of associated emotions and states
(Joye and Bolderdijk, 2015, p. 7).

This study endeavors to propose an instrument to measure
transcendent emotions, including precisely the content referred
to until now as part of awe.
This study aims to help establish transcendent and spiritual contents related to nature, and proposes the sublime as a unifying feeling that encompasses awe and positive and pleasurable emotions within a single construct.

To date, there is no empirical assessment of wilderness experience that includes emotional responses of awe, positive and pleasurable emotions, and epiphany within the same construct. Based on the Bethelmy (2012) conceptual definition, the sublime emotion toward nature is defined as a transcendent, spiritual emotion involving epiphany and a mix of heightened fear (awe) and pleasurable emotions, like wellbeing and others, provoked by a stimulus of impressive and frightful qualities in the experience with nature. The objective, therefore, is to create an operational definition of sublime emotion toward nature and design a reliable and valid instrument to measure it.

Instrument creation followed Kerlinger and Lee (2000) and Abad et al. (2011) recommendations, which maintain that instruments, in addition to being reliable, should have good indicators of discriminant and predictive validity. We expect that this operational measure of sublime emotion toward nature will yield good reliability indexes, one indication of internal consistency. Furthermore, the contents (items) of the sublime emotion scale should differ from other measures of similar emotional content, like love and care for nature (Perkins, 2010), connectedness with nature (Mayer and Frantz, 2004), and transcendent emotion (Williams and Harvey, 2001) – though it has certain elements in common with those variables – if we are to conclude that the scale has content and construct validity (Kerlinger and Lee, 2000; Abad et al., 2011).

Love and care for nature (Perkins, 2010), connectedness with nature (Mayer and Frantz, 2004) and environmental intention (Amérgio et al. 2012) are selected because these measures content items about the emotions to nature and affinity and connectedness to nature related to environmental intention and behavior. For example, love and care for nature (2010) was significantly related with connected with nature and environmental behavior (see Perkins, 2010).

Another characteristic of a good operative definition is the explanatory power as an indicator of predictive validity (Kerlinger and Lee, 2000; Abad et al., 2011). Previous results indicate that emotions toward nature have a predictive power over environmental behaviors (Grob, 1995) and even a mediating role (Corraliza and Bethelmy, 2011). Therefore, the relation of the new measurement of sublime emotion toward nature with other variables of the environmental intention and behavior is explored as an indicator of predictive validity.

### MATERIALS AND METHODS

#### Participants and Procedure

The sample was comprised of 280 members of the general population of Madrid, of whom 55.2% were women and 44.8% men. 225 lived in an urban area (80.4%) and 55 in a rural area (19.6%). Their average age was 41.1 (SD = 14.9), and their minimum and maximum ages were 17 and 77 years old, respectively.

Self-report surveys were administered by interviewers' in-person so they could provide direct support. Non-probabilistic convenience sampling was applied. The survey took an average of 15 min to administer.

#### Instruments

##### Sublime Emotion Toward Nature (SEN) Scale

Initially, an instrument with 62 items was created based on the conceptual emotional categories in the meaning of nature cited in Bethelmy (2012) qualitative study, which included items referring to feelings of wellbeing, transcendent emotions, and sense of connectedness with nature. Following an earlier study in a sample of 76 participants in the city of Madrid (see Bethelmy, 2012),

### TABLE 1 | Summary of Basic Content Referenced about Sublime and Transcendent Emotion.

| Term | Definition | Author (s) |
|------|------------|------------|
| Sublime emotion | Emotion characterized by astonishment, awe, fear, respect and admiration. Feeling a mix of terror and pleasure that becomes a “delightful horror” if no real danger is perceived. Stimuli that trigger it include natural and non-natural places with particular features and properties, qualities of human frailty, the infinite, eternity, and certain works of art. This is distinct from “beauty.” | Burke (1757/2005) |
| Sublime emotion toward nature | Experiencing fear and pleasure in a wilderness perceived as powerful. In a mix of awe, humility, self-transcendence, joy, sadness, enthusiasm, and connection with the whole universe. This is produced by “horrid” landscapess as well as superhuman dimensions like eternity, infinity, and the ineffable. | Bodei (2008/2011) |
| Self-transcendence | Peak experience. A larger-than-life experience of self-realization characterized by a mix of spiritual emotions like enlightenment, awe, reverence, humility, happiness, wonder, and connection to the universe, among others. | Maslow (1964) |
| Feeling of awe | An emotional experience characterized by fear, vulnerability, humility, disorientation, inspiration, and renewal; and in contrast, sensing a higher power, beauty, and justice, among other things. A mix of emotional states – epiphany, joy, mortal fear, vitality, humility, vulnerability, respect, and sensing a connection with all of nature – elicited by nature’s mystery, power, savagery, and unpredictability. | Ketner and Haidt (2003); Shiota et al. (2007); Cousins et al. (2009) |
after an analyses of scale from 1 (strongly disagree) to 7 (strongly agree). A yield of 1.0 and items-total correlations more than .72 (Nunnally, 1978), the scale was reduced to 26 items, which comprise the instrument administered in the present study. Participants' answers were recorded on a 5-point Likert-type scale from 1 (strongly disagree) to 5 (strongly agree). A new reduction of SEN items was done in the present research resulting in 18 items, eliminating those that contribute least to the internal consistency and validity, according to methodological and psychometric recommendations (Nunnally, 1978; Lorenzo-Seva and Ferrando, 2006; Abad et al., 2011).

**Love and Care for Nature (LCN) Scale.**
A Spanish version of Perkins (2010) original was created; its 15 items comprise a single factor that explains 71.18% of variance. The original scale in English has a reliability of α = 0.97. Its items were translated into Spanish by three translators and specialists in this field. The scale measures affective and emotional aspects like feelings of connectedness with nature, interest, fear, and care toward nature (Perkins, 2010). Responses are given on a 7-point Likert-type scale from 1 (strongly disagree) to 7 (strongly agree).

**Environmental Attitudes**
The scale devised by Amérigo et al. (2012) was utilized. It is comprised of four factors (20 items in total) that together explain 52.3% of total variance: anthropocentrism (5 items, α = 0.705), environmental apathy (5 items, α = 0.902), emotional affinity toward nature (5 items, α = 0.845), and connectedness with nature (5 items, α = 0.850). The Spanish version of the last dimension was previously used by Corraliza and Bethelmy (2011, α = 0.830). The instrument’s 5-point Likert-type response scale ranges from 1 (strongly disagree) to 5 (strongly agree).

**Environmental Intentions**
We used the Spanish version of Stern et al. (1999) scale, translated for the purposes of this study. Its two items measure people’s willingness to sacrifice to protect the environment. It has a 5-point Likert-type response scale ranging from 1 (strongly disagree) to 5 (strongly agree).

**Environmental Behaviors**
We used a translation of scales designed by Stern et al. (1995) and Stern et al. (1999), also utilized by Perkins (2010). A Spanish version was designed for use in the present study. The questionnaire’s five items measure the incidence of environmentalist action taking on a 4-point Likert-type response scale from 1 (never) to 4 (always).

**Statistical Analysis**
For the sublime emotion toward nature measure, we conducted exploratory factor analysis (EFA); eliminating items that contribute least to internal consistency and validity, considering the value of each factor’s item-total correlations, corrected item-total correlations, factor loadings (Nunnally, 1978; Abad et al., 2011), and conceptual dimension according to the definition criteria (Bethelmy, 2012). The FACTOR program (Lorenzo-Seva and Ferrando, 2006) was employed during EFA of sublime emotion toward nature; it is one of the most highly recommended for factor analysis of psychosocial variables. The FACTOR program considers the polychoric correlation matrix, the ordinal measurement scale of the items and values of asymmetry and kurtosis that are not in the recommended levels. In addition, the FACTOR program calculates goodness-of-fit indicators and coefficients of the residuals of the resulting factor distribution (Lorenzo-Seva and Ferrando, 2006).

We calculated Cronbach’s reliability coefficient to gauge internal consistency, tested correlations to determine if there was evidence of convergent and criterion (concurrent) validity in relation to other variables.

To examine the relationships between variables, we calculated Pearson’s correlation coefficients and potential multicollinearity effects between variables in SPSS, version 19.0. The method of multiple and simple linear regression were applied to determine the effect of sublime emotion toward nature on environmental behaviors.

**RESULTS**

**Psychometric Indicators on the Sublime Emotion Toward Nature (SEN) Scale**
All the variables we measured showed skewness between 0.009 and −0.6 (minimum and maximum), and kurtosis between −0.009 and −0.65 (minimum and maximum). Results in terms of Bartlett’s statistic (4297.7; df = 276 and p < 0.0001) and Kaiser-Meyer-Olkin (KMO = 0.95) convey that the sample meets requirements for EFA to proceed. Regarding the others variables of the study, the Spanish version of love and care for nature obtained an adequate reliability index (α = 0.923) and just one factor. Furthermore, results of exploratory factor analysis determined that the scale’s awe item should be excluded (factor loading < 0.25), so it was eliminated from the Spanish version. It does not share content with the scale’s other items, suggesting it belongs to a different variable related to fear and respect toward nature. The environmental intention reliability is adequate, and its internal consistency α = 0.72. The environmental behaviors scale is sufficiently reliable, with an internal consistency of α = 0.81. According to principal components analysis, the one-factor solution accounts for 57.6% of explained variance (eigenvalue = 2.8), and the scale’s five constituent items have factor loadings over 0.60 (ranging from 0.79 to 0.62).

Results of EFA of the SEN scale found two factors. In the first EFA, CFI was found to be under 0.85, and two items had very high residuals (item 13: me siento insignificante ante la majestuosidad de la naturaleza [I feel insignificant next to nature’s majesty]; and item 20: me siento insignificante ante lo imponente de la naturaleza [I feel insignificant compared to nature’s awesome power]), suggesting their content may have been very similar (standardized residual of 3.68). After eliminating item 20, CFI rose to 0.89, but a high residual remained between item 17 (Me siento con una vitalidad única cuando estoy en la naturaleza [In the wilderness, I feel a singular
vitality]) and item 19 (Me siento con mucha energía cuando estoy en la naturaleza [I feel very energized when I’m in nature]) (standardized residual of 3.23). By eliminating item 19, we found that the scale's goodness of fit indexes were suitable: CFI = 0.90, Chi-squared = 624.6, degrees of freedom = 229, p > 0.001, RMR = 0.0467, GFI = 0.99, AGFI = 0.99.

Using the method of oblimin rotation, items 3, 6, 10, 12, 13, 14, 16, 18, and 23 loaded onto Factor 1, accounting for 44.80% of

### TABLE 2 | Clustering for Exploratory Factor Analysis with Oblimin Rotation, of the Sublime Emotion toward Nature (SEN) Scale.

| SEN items                                                                 | I (α = 0.89) | II (α = 0.94) |
|---------------------------------------------------------------------------|--------------|---------------|
| 23. Siento miedo de mi vulnerabilidad cuando estoy en la naturaleza       | 0.964        |               |
| [In the wilderness, I fear my own vulnerability]                          |              |               |
| 18. Siento temor ante el misterio que encierra la naturaleza              | 0.914        |               |
| [I am fearful of the mystery that nature holds]                           |              |               |
| 12. Siento temor ante lo impredecible de la naturaleza                     | 0.890        |               |
| [I feel awe of nature’s unpredictability]                                |              |               |
| 16. Estar en la naturaleza me hace sentir la fragilidad de la vida        | 0.714        |               |
| [Being in nature makes me aware of life’s fragility]                     |              |               |
| 10. Siento temor reverencial cuando estoy en la naturaleza                | 0.663        |               |
| [In the wilderness, I feel awe and reverence]                            |              |               |
| 13. Me siento insignificante ante la majestuosidad de la naturaleza       | 0.496        |               |
| [I feel insignificant next to nature’s majesty]                          |              |               |
| 6. Estar en la naturaleza me hace sentir la vulnerabilidad del mundo      | 0.491        |               |
| [Being in the wilderness makes me realize how vulnerable the world is]   |              |               |
| 3. Cuando estoy en la naturaleza siento que los humanos somos tan vulnerables como los otros seres vivos que compartimos la Tierra | 0.428        |               |
| [When I am in the wilderness, I sense that humans are as fragile as any other living being on Earth] |              |               |
| 14. Cuando estoy en la naturaleza siento la presencia de una fuerza superior y sobrenatural | 0.426        |               |
| [In the wilderness, I feel the presence of a higher, supernatural power]  |              |               |
| 5. Estar en la naturaleza es una de las cosas que me hacen sentir felicidad auténtica | 0.870        |               |
| [Being in the wilderness is one of the things that make me feel truly happy] |              |               |
| 9. Tengo un profundo sentimiento de conexión con la naturaleza            | 0.841        |               |
| [I feel deeply connected to nature]                                      |              |               |
| 7. Tengo un profundo sentimiento de pertenencia con la naturaleza         | 0.768        |               |
| [In nature I feel a deep sense of belonging]                             |              |               |
| 24. Estar en la naturaleza me inspira en la vida                          | 0.764        |               |
| [Being in nature brings inspiration to my life]                          |              |               |
| 15. Siento profunda armonía con el universo cuando estoy en la naturaleza | 0.745        |               |
| [In the wilderness, I sense a profound harmony with the universe]        |              |               |
| 2. Me siento más vivo que nunca cuando estoy en la naturaleza             | 0.744        |               |
| [I feel more alive than ever in nature]                                  |              |               |
| 17. Me siento con una vitalidad única cuando estoy en la naturaleza       | 0.734        |               |
| [In the wilderness, I feel a singular vitality]                           |              |               |
| 21. La grandiosidad de la naturaleza me hace sentir libre                 | 0.720        |               |
| [The magnificence of nature makes me feel free]                          |              |               |
| 8. No tengo palabras para decir todo lo que siento cuando estoy en la naturaleza o veo documentales acerca de ella o me doy cuenta de su presencia | 0.699        |               |
| [Words cannot describe everything I feel when I am in the wilderness, I watch a nature documentary, or I become aware of nature’s presence] |              |               |
| 26. Estar en la naturaleza me hace sentir conectado profundamente con todos los seres vivos | 0.694        |               |
| [Being in nature makes me feel deeply connected to all living beings]    |              |               |
| 4. Siento el enorme poder de la naturaleza                               | 0.597        |               |
| [I sense nature’s enormous power]                                        |              |               |
| 1. A menudo siento que lo que tengo ante mí cuando estoy en la naturaleza, me deja sin palabras | 0.581        |               |
| [Often what is before me in the wilderness leaves me speechless]         |              |               |
| 11. Siento que soy parte del universo cuando estoy en la naturaleza       | 0.569        |               |
| [In the wilderness, I feel like part of the universe]                    |              |               |
| 25. Cuando estoy en la naturaleza siento la armonía de la vida y la muerte | 0.466        |               |
| [In the wilderness, I feel that life and death are in harmony]           |              |               |
| 22. Tengo una sensación de eternidad cuando estoy en la naturaleza o pienso sobre ella | 0.456        |               |
| [I feel a sense of eternity when I am in the wilderness, or think about it] |              |               |

I: Awe; II: Inspiring energy. Weighted factor > 0.40.
variance (eigenvalue = 10.8). Meanwhile, items 1, 2, 4, 5, 7, 8, 9, 11, 15, 17, 21, 22, 24, 25, and 26 loaded on Factor 2, explaining 12.2% of variance (eigenvalue = 2.93). Factor loadings of items onto their respective factors ranged from 0.45 to 0.89. Factor loadings of items onto each factor appear in Table 2.

By means of a more thorough analysis, we eliminated the items that contribute least to internal consistency, to each factor's item-total correlations and corrected item-total correlations, to factor loadings, and to belonging with the dimension's theory and content. Also, item selection criteria included mean under 4, and SD under 1.

This led us to eliminate items 3 and 14 from Factor 1 for both lower item-total correlation and lower factor loading. Item 6 was eliminated for lower factor loading, loading on both factors, and because its item-total correlation was low compared to other items (item-total r = 0.61; α = 0.881) (See Table 3).

Likewise, items 1, 2, and 4 were eliminated from Factor II. Item 8 which showed higher item-total correlation and internal consistency, repeats content from item 1. Item 4's content is ambiguous and more closely aligned with Factor 1 (contents of awe). Item 2 was eliminated because its content is repeated in item 17, its corrected item-total correlation (r = 0.67) is lower than item 17's (r = 0.71), its average score is over 4, and its standard deviation is under 1 (see Table 3). Items 22 and 25 loaded only in Factor II, both with an important contribution to the meaning of this Factor.

The refined SEN scale has a total of 18 items distributed across two factors. Items 10, 12, 13, 16, 18, and 23 loaded onto Factor 1, and its internal consistency is α = 0.881. Meanwhile Factor II includes items 5, 7, 8, 9, 11, 15, 17, 21, 22, 24, 25, and 26, with an internal consistency of α = 0.933. Below we define each factor's contents as a function of the items belonging to it.

Factor I is defined by awe, that is, contents of vulnerability, fear of the unpredictable, of mystery, and life's fragility and insignificance. Its meaning relates to fear of the natural world, which is perceived as unpredictable, powerful, and majestic. Feelings of humility are also present, along with voluntary submission to and respect for nature, onto which subjugating qualities are projected, along with a higher power and mystery.

Factor II has been defined as inspiring energy, characterized by joy, freedom, inspiration, deep connection with living beings and with nature, harmony with the universe, vitality, eternity, a sense of belonging with nature, harmony between life and death, speechlessness about feelings of astonishment, epiphany, intense emotional arousal about things that are transcendent or exalted. Similarly, it involves a state of vigor and inspiring energy toward life. These aspects altogether – harmony and connection on the one hand; energy, freedom, and inspiring vitality on the other – can be interpreted as a state of emotional euphoria related to wellbeing, happiness, and fascination toward the transcendence of nature and higher powers in the universe.

In view of the above, sublime emotion's operational definition is 2-fold: it awakens feelings of liberation, inspiration, and being overcome by a sense of harmony and connection with the universe, living beings, and nature; and simultaneous feelings of awe and respect for nature, including living beings, the universe, and the existential phenomena of life and death (refer to Table 2 for the definitive, complete SEN scale).

Last, we analyzed two factors, awe and inspiring energy. The criterion that each factor has at least four to seven items was met (Abad et al., 2011). Pearson's bivariate correlation between the two factors is r = 0.52 (p < 0.01), suggesting a moderate, significant relationship between the two.

This final version of SEN (18 items) is used for calculating the analyses of descriptive, comparative and correlational data between variables. Analysis of awe and inspiring energy results follow.

### Analyses of Descriptive, Comparative, and Correlational Data Between Variables

Respondents' awe scores were moderate (M = 2.86, SD = 1), whereas inspiring energy scores tended to be moderate-high

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**Table 3** Criteria to Eliminate Items from Factor I of the SEN: Descriptive Statistics, Reliability, and Homogeneity.

| Item | M     | SD   | r²   | α   | Factor loading |
|------|-------|------|------|-----|----------------|
| s3   | 3.7   | 1.2  | 0.56 | 0.884 | 0.43           |
| s6   | 3.4   | 1.2  | 0.61 | 0.881 | 0.44           |
| s10  | 2.6   | 1.2  | 0.63 | 0.879 | 0.66           |
| s12  | 2.9   | 1.3  | 0.69 | 0.874 | 0.89           |
| s13  | 3.6   | 1.2  | 0.61 | 0.881 | 0.50           |
| s14  | 2.9   | 1.4  | 0.53 | 0.888 | 0.43           |
| s16  | 3.1   | 1.2  | 0.75 | 0.869 | 0.71           |
| s18  | 2.6   | 1.3  | 0.70 | 0.873 | 0.91           |
| s23  | 2.4   | 1.3  | 0.74 | 0.870 | 0.96           |

Factor loading > 0.40, s = sublime. | Item-total correlation. Factor loading if item is eliminated.

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**Table 4** Criteria to Eliminate Items from Factor II of the SEN: Descriptive Statistics, Reliability, and Homogeneity.

| Item | M     | SD   | r²   | α   | Factor loading |
|------|-------|------|------|-----|----------------|
| s2   | 4.1   | 0.9  | 0.67 | 0.938 | 0.74           |
| s5   | 3.9   | 1.0  | 0.70 | 0.937 | 0.87           |
| s7   | 3.6   | 1.2  | 0.71 | 0.936 | 0.77           |
| s8   | 3.6   | 1.2  | 0.72 | 0.936 | 0.69           |
| s9   | 3.6   | 1.2  | 0.80 | 0.934 | 0.84           |
| s15  | 3.5   | 1.2  | 0.78 | 0.935 | 0.75           |
| s17  | 3.8   | 1.1  | 0.71 | 0.937 | 0.73           |
| s21  | 3.9   | 1.9  | 0.70 | 0.937 | 0.72           |
| s24  | 3.7   | 1.2  | 0.75 | 0.935 | 0.76           |
| s26  | 3.5   | 1.2  | 0.76 | 0.935 | 0.69           |
| s1   | 3.9   | 1.1  | 0.62 | 0.939 | 0.58           |
| s4   | 3.9   | 1.0  | 0.64 | 0.938 | 0.59           |
| s11  | 3.5   | 1.2  | 0.67 | 0.938 | 0.57           |
| s22  | 3.1   | 1.3  | 0.61 | 0.940 | 0.46           |
| s25  | 3.1   | 1.3  | 0.62 | 0.939 | 0.47           |

Factor loading > 0.40, s = sublime. | Item-total correlation. Factor loading if item is eliminated.
(M = 3.55, SD = 0.89) considering the scale range is 1–5. For minimum and maximum total scores values on each variable, see Table 5. The data tended toward normal distribution, given that the absolute value of skewness was less than 2, and kurtosis under 4 (Abad et al., 2011).

Scores on love and care for nature were high in this sample (M = 5.3, SD = 1.24), considering the scale range is 1–7. Meanwhile, anthropocentrism (M = 2.28, SD = 0.92, scale range 1–5) fell in the moderate-low range. Likewise, environmental apathy scores were very low in this sample, nearly hitting the minimum possible score (M = 1.77, SD = 0.82, scale range 1–5). Emotional affinity toward nature and connectedness with nature (M = 3.9, SD = 0.87, M = 3.65, SD = 0.9, respectively) got moderate-high scores (scale range 1–5). Environmental intention also registered high scores (M = 3.69, SD = 0.89, scale range 1–5) and environmental behaviors score fell in moderate range (M = 2.48, SD = 0.75, scale range 1–4).

**Convergent Validity**

First of all, we examined correlational data to determine if there was evidence of convergent validity between the SEN scale’s two factors and similar variables, like love and care for nature, connectedness with nature, and emotional affinity toward nature (See Table 6).

Awe showed significant correlations, r = 0.23 (p < 0.001) and r = 0.34 (p < 0.001), with connectedness with nature and love and care for nature, respectively. That was sufficient evidence for its convergent and discriminant validity since the contents, while correlated, belong to different constructs. The correlation between awe and emotional affinity toward nature was not significant (r = 0.11, p > 0.05).

On that note, inspiring energy had a high correlation with love and care for nature (r = 0.85, p < 0.001), and moderate, significant correlations with connectedness with nature (r = 0.57, p < 0.001) and emotional affinity toward nature (r = 0.56, p < 0.001). That is ample evidence of convergent and discriminant validity; we expected these contents, which refer to feelings during wilderness contact, would be interrelated and complementary even though they are measured as distinct constructs. Please bear in mind that in the Spanish adaptation of the Love and Care for Nature scale created for the purposes of this study, the item tapping awe and admiration toward nature did not yield acceptable values and was eliminated. As a result, that measure concentrates on content like interconnectedness, wellbeing, and care for nature (see Perkins, 2010).

A novel finding was awe’s significant, positive correlation with anthropocentrism (r = 0.16, p < 0.05) and environmental apathy (r = 0.14, p < 0.05), though the coefficients were low.

Awe displayed a moderate-low yet significant correlation with environmental behaviors (r = 0.17, p < 0.001), presenting significant albeit low-level evidence of criterion validity. Correlations between inspiring energy and environmental intentions (r = 0.23, p < 0.001) as well as environmental behaviors (r = 0.36, p < 0.001) were moderate and significant, thus providing sufficient evidence of criterion validity.

**Predictive Power of Sublime Emotion Toward Nature**

Coefficients of determination (partial multiple regression) were calculated, and a scatter plot created to test criterion validity (Abad et al., 2011). Awe explained a significant, but small portion of variance in environmental behaviors (R² = 0.030, F = 8.5, p < 0.05), and yielded a partial regression coefficient of β = 0.173 (p < 0.05). Again, inspiring energy showed sufficient evidence of criterion validity with respect to environmental behaviors, explaining 12.7% of variance (R² = 0.13, F = 40.3, p < 0.001), and yielding a partial regression coefficient of β = 0.36 (p < 0.001). Considering these results, predicting environmental variables should be undertaken with caution.

The ability of each factor of sublime emotion toward nature – awe and inspiring energy – to predict environmental behaviors yielded the following results (multiple regressions).

Awe and inspiring energy predict environmental behaviors both directly and significantly (β = 0.17, p < 0.01, β = 0.36, p < 0.001, respectively) (see Table 7). However, when the effect of inspiring energy intervenes, awe no longer appears to predict environmental behaviors (see Table 7).

**DISCUSSION**

The present research objectives were: to create a valid, reliable instrument with which to measure sublime emotion toward nature, one that captures the definition of the sublime as a mix of several emotions; and to differentiate sublime emotion
TABLE 6 | Correlations among the Study’s Variables (Bivariate Pearson Correlation).

| Variables                                    | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   |
|----------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. Awe                                       |     |     |     |     |     |     |     |     |
| 2. Inspiring energy                          |     | 0.47**|     |     |     |     |     |     |
| 3. Love and care for nature                  |     |     | 0.34**| 0.85**|     |     |     |     |
| 4. Anthropocentrism                          | 0.16*|     | 0.04| 0.01|     |     |     |     |
| 5. Environmental apathy                      | 0.14*| 0.18*|     | 0.27*|     | 0.37**|     |     |
| 6. Emotional affinity toward nature          | 0.11| 0.56**| 0.64**|     | 0.01| 0.30**|     |     |
| 7. Connectedness with nature                 | 0.23**| 0.57**| 0.63**|     | 0.05| 0.20**| 0.59**|     |
| 8. Environmental intention                  | 0.05| 0.23**| 0.34**| 0.12*| 0.32*| 0.35**| 0.39**|     |
| 9. Environmental behaviors                  | 0.17*| 0.36**| 0.48**| 0.09| 0.24**| 0.39**| 0.41**| 0.48**|

*p < 0.05. **p < 0.001.

TABLE 7 | Simple Linear Regression and Multiple Regression of Sublime Emotion Predicting Environmental Behaviors.

| Variables                                    | B   | SE  B | β   | R²  | F   |
|----------------------------------------------|-----|-------|-----|-----|-----|
| Simple linear regression                     |     |       |     |     |     |
| Inspiring energy                             | 0.12| 0.02  | 0.36**| 0.13| 40.3**|     |
| Awe                                          | 0.11| 0.04  | 0.17** | 0.03| 8.56**|     |
| Multiple regression                          |     |       |     |     |     |
| Inspiring energy                            | 0.12| 0.02  | 0.35**| 0.12| 20.1**|     |
| Awe                                          | 0.00| 0.04  | 0.00|     |     |

a Effect of inspiring energy in multiple regression. b Effect of awe controlled for in multiple regression. Durbin-Watson = 1.97. **p < 0.001.

toward nature from other variables – such as love and care for nature, environmental attitudes, and environmental behaviors. This study produced a valid, reliable way to operationally define sublime emotion toward nature.

On the Operational Definition of Sublime Emotion Toward Nature

Sublime emotion toward nature is a composite of feelings of awe and inspiring energy, which describe different affective experiences. Awe is defined as a mix of fear and respect toward nature, which is experienced as so much larger than oneself. Meanwhile, inspiring energy is defined as the feeling that awakens a sense of vitality, happiness, freedom, and unity between the self and the natural world (and by extension the individual's surroundings). Both are related to the two basic components of transcendent emotion, which according to Yaden et al. (2017), are: (a) annihilational (reduction of self-boundaries and self-salience) and (b) relational, “sense of connectedness, even to the point of oneness . . . with other people and aspects of one’s environment or surrounding context” (p. 145).

Sublime emotion toward nature is also discernably different from awe alone, depending on the trigger stimulus and the resulting experience. The present research results show that a sense of awe is part of sublime emotion; but sublime emotion includes additional content.

Inherent to awe are feelings of vulnerability, insignificance, and fear of nature’s qualities, such as magnificence, power, mystery, unpredictability, and the fragility of life. For example, item 18 (Siento temor ante el misterio que encierra la naturaleza [I am fearful of the mystery that nature holds]), captures these contents. This appears, too, in Keltner and Haidt (2003) definition, which other researchers in this field have followed. Inspiring energy, meanwhile, includes contents of happiness, unity, and belonging with nature, the universe, and other living beings; a sense of inspiration, freedom, vitality, eternity, ineffability, and harmony between the polar opposites of life and death. Item 8 on the SEN scale (No tengo palabras para decir todo lo que siento cuando estoy en la naturaleza o veo documentos acerca de ella o me doy cuenta de su presencia [Words cannot describe everything I feel when I am in the wilderness, I watch a nature documentary, or I become aware of nature’s presence]) captures the ineffability described by James (1902/1986) and Williams and Harvey (2001), which is one of the unique qualities of spiritual reactions to nature. Furthermore, “ineffability” is related to vitality and renewed energy to make a positive change (Williams and Harvey, 2001).

The awe factor we observed is consistent with the categories Ashley (2007) reported in his qualitative study. The inspiring energy factor, meanwhile, is empirically supported by earlier findings about the categories of spiritual inspiration in nature, connectedness, and a sense of belonging with nature (Fredrickson and Anderson, 1999; Schroeder, 2007; Vining et al., 2008).

Meanwhile, factors which this study found to define sublime emotion toward nature would overlap in meaning with self-transcendent feelings in nature. Inspiring energy encompasses happiness and transcendental joy, which are also part of the definition of awe. By the same token, Robbins (2006) found that the sense of pure happiness – joy – relates to having experienced fear and respect before that sheer happiness. With that in mind, we recommend further examining the conceptual link between the two elements of sublime emotion, whether or not they effectively constitute two emotional elements with distinct psychological features and functions.

In light of the above, the present study lays out empirical evidence of a reciprocal relationship between ambivalent feelings with spiritual qualities, both triggered by wilderness encounters. Sublime emotion toward nature, thusly defined as a mix of awe and inspiring energy, is conceptually supported by Cousins et al. (2009) and Seamon (1984) psychological definitions of sublime...
emoción en la naturaleza. Este doble emoción está conectado a otras emociones espirituales y transcendentes, como la emoción de ser y la emoción de autoafiliación hacia la naturaleza, y la conexión con la naturaleza. Para instancias, la energía inspiradora y el amor y cuidado por la naturaleza podrían tener algún contenido en común pero se refieren a diferentes emociones durante experiencias de naturaleza. En todas las probabilidades, el contenido de Perkins (2010) es más estrechamente alineado con emociones activadas por la inspiración, porque comparten contenido de identificación y conexión con la naturaleza, y buenas emociones. Estas dos variables podrían lógicamente, por tanto, estar altamente correlacionadas, sugiriendo una posibilidad de colinealidad entre ellas, aunque podría ser debido a la similaridad de contenidos en la identificación, unión con la naturaleza y sensación de elementos positivos. Sin embargo, aunque comparten ciertas emociones de inscripción, la energía inspiradora y el amor y cuidado por la naturaleza no son el mismo variable, porque responden a funciones diferentes de la experiencia de naturaleza. El contenido de la inspiración y el amor y cuidado por la naturaleza (medida operativa) es específico para la relación y la función del ambiente, pero no esas de la inspiración, las cuales no hacen directa mención del cuidado ecológico.

Amor y cuidado por la naturaleza también son diferentes de la inspiración. El único elemento relacionado en el Love and Care for Nature scale (item 11, a menudo me surgen sentimientos de temor y admiración cuando estoy en la naturaleza [a veces siento el amor y la admiración hacia la naturaleza]) no ostenta en su factor único y debería ser eliminado de los resultados de este estudio. Sentir amor y admiración hacia la naturaleza es una experiencia compartida con otros, pero con diferentes emociones que provocan diferentes emociones en las personas, como su recuerdo o su apreciación de un “beauty,” “attractive,” y “pleasurable” experiencia de naturaleza (Armstrong y Detwiler-Bedell, 2008), y el deseo de expresar el amor y el cuidado por la naturaleza (Perkins, 2010).

**Sublime Emotion Toward Nature in Relation to Other Variables**

En relación con otros valores, el amor y el cuidado por la naturaleza ecológico, en nuestra investigación, encontramos que son selectivos que ambas emociones de inspiración explican positivamente y significativamente el comportamiento ecológico. Estos resultados muestran que la emoción sublime se relaciona con la naturaleza: la emoción de ser y la emoción de autoafiliación hacia la naturaleza, también en nuestro estudio, la emoción de admiración y el amor por la naturaleza. Ambas emociones pueden ser consideradas como un signo de emoción sublime hacia la naturaleza. Así, las emociones de admiración y el amor por la naturaleza se pueden considerar como emociones transvasalizantes, pero no todas las experiencias transvasalizantes son emociones transvasalizantes.

Podemos concluir que la emoción sublime hacia la naturaleza es un tipo de transcendenza, pero no todas las experiencias transvasalizantes son emociones transvasalizantes. El amor y la admiración hacia la naturaleza es un tipo de transcendenza, pero no son emociones transvasalizantes. En este sentido, el amor y la admiración hacia la naturaleza son emociones transvasalizantes, pero no necesariamente dirigidas hacia la naturaleza, y no necesariamente dirigidas al deseo de proteger la naturaleza.

**Future Developments**

Podemos concluir que la emoción sublime hacia la naturaleza es un tipo de transcendenza, pero no todas las experiencias transvasalizantes son emociones transvasalizantes. El amor y la admiración hacia la naturaleza es un tipo de transcendenza, pero no son emociones transvasalizantes. En este sentido, el amor y la admiración hacia la naturaleza son emociones transvasalizantes, pero no necesariamente dirigidas hacia la naturaleza, y no necesariamente dirigidas al deseo de proteger la naturaleza.

Awe y inspiración energética sugieren la posibilidad de la dualidad de la emoción sublime hacia la naturaleza: inspiración energética provocando actividades externamente orientadas, y el amor, por lo que, en este sentido, las emociones son diferentes, pero a un punto en el tiempo, están presentes, y pueden complementar entre sí y simultáneamente.
We recommend further research on the differential as well as joint effects of the factors of sublime emotion toward nature, and the wilderness settings that evoke the sublime. It is also important to keep unpacking the relationship between sublime emotion toward nature and environmentalism, and other positive psychological aspects like wellbeing and psychological restoration during wilderness experiences.

Finally, it is necessary more studies with a larger sample for improving the statistical power of the sublime emotion toward nature measure. In this sense, it is important to know an analysis of variance of sublime emotion toward nature between groups of age and others socio psychological variables, including cultural differences, according to the transcendence emotions literature.

**ETHICS STATEMENT**

An ethics approval was not required at the time the study was conducted as per applicable institutional and national guidelines. However, this work is carried out within the framework of the studies planned in the project “Sublime experience and environment: psychological analysis of transcendental emotions in relation to nature” (PSI-2013-44939-P), approved for the evaluating committee from the Secretariat Of State Of Research, Development And Innovation of the Government of Spain, with the maximum qualification “A.” The research team undertook to guarantee the anonymity of the answers. All subjects gave informed consent about the procedure, duration and the objectives of the study. Each participant only answered an anonymous questionnaire, and they were free to decline to participate from the research at any time. The information was treated with confidential and only use for research purpose.

**AUTHOR CONTRIBUTIONS**

LB and JC contributed to all sections in the development of the research and the manuscript. LB conceived the first idea and designed the first instrument to measure the sublime emotion of nature. LB and JC contributed to the final version of the instrument.

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**REFERENCES**

Abad, F., Olea, J., Ponsoda, V., and García, C. (2011). *Medición En Ciencias Sociales Y De La Salud*. Madrid: Síntesis.

Amérito, M., Aragonés, L., and García, J. (2012). Exploring the dimensions of environmental concern. *Integr. Prop. Psicol.* 3, 353–365.

Armstrong, T., and Detweiler-Bedell, B. (2008). Beauty as an emotion: the exhilarating prospect of mastering a challenging world. *Rev. Gener. Psychol.* 12, 305–329. doi: 10.1037/a0012558

Ashley, P. (2007). Toward an understanding and definition of wilderness spirituality. *Aus. Geograph.* 38, 53–69. doi: 10.1080/00049180601175865

Bethelmy, L. (2012). *Experiencia De Lo Sublime En La Vinculación Emocional Con La Naturaleza: Una Explicación De La Orientación Proambiental*. doctoral dissertation, Universidad Autónoma de Madrid, Madrid.

Bodei, R. (2008/2011). *Paisajes Sublimes. El Hombre Ante La Naturaleza Salvaje*. Madrid: Siruela.

Bonner, E. T., and Friedman, H. L. (2011). A conceptual clarification of the experience of awe. *Humanist Psychol.* 39, 222–235. doi: 10.1080/00952901.2011.593372

Burke, E. (1757/2005). *De Lo Sublime Y De Lo Bello*. Madrid: Alianza Editorial.

Corraliza, J. A., and Bethelmy, L. (2011). Vinculación a la naturaleza y orientación por la sostenibilidad [Connectedness with nature and sustainability orientation]. *Rev. De Psicol. Soc.* 26, 325–336. doi: 10.1174/021347411797361338

Cousins, J., Evans, J., and Sadler, J. (2009). ’Tve paid to observe lions, not map roads!’ – an emotional journey with conservation volunteers in south africa. *Geoforum* 40, 1069–1080. doi: 10.1016/j.geoforum.2009.09.001

Caikzentmihalyi, M. (2014). *Flow and the Foundations of Positive Psychology*. New York, NY: Springer. doi: 10.1007/978-94-017-9088-8

Frederickson, L., and Anderson, D. (1999). A qualitative exploration of the wilderness experience as a source of spiritual inspiration. *J. Environ. Psychol.* 19, 21–39. doi: 10.1006/jevp.1998.0110

Groh, A. (1995). A structural model of environmental attitudes and behaviour. *J. Environ. Psychol.* 15, 209–220. doi: 10.1016/0272-4944(95)90004-7

Haidt, J. (2003). “Elevation and the positive psychology of morality,” in *Flourishing: Positive Psychology and the Life Well-Lived*, eds C. L. M. Keyes and J. Haidt (Washington, DC: American Psychological Association), 275–289. doi: 10.1037/10594-012

Hartig, T., and Evans, G. (1993). “Psychological foundations of natural experiences,” in *Behavior and Environment: Psychological and Geographical Approaches*, eds T. Gärling and R. G. Golledge (Amsterdam: Elsevier B.V), 427–257.

Hinds, J., and Sparks, P. (2008). Engaging with the natural environment: the role of affective connection and identity. *J. Environ. Psychol.* 28, 109–120. doi: 10.1016/j.jenp.2007.11.001

Hinds, J., and Sparks, P. (2011). The affective quality of human-natural environment relationships. *Evol. Psychol.* 9, 451–469. doi: 10.1177/14740747109900314

Hood, R. W., Jr. (1975). The construction and preliminary validation of a measure of reported mystical experience. *J. Sci. Study Religion* 14, 29–41. doi: 10.2307/1384454

James, W. (1890/1950). *The Principles of Psychology*. New York, NY: Dover Publications, Inc.

James, W. (1902/1986). *Las Variedades De La Experiencia Religiosa*. Barcelona: Peninsula.

Johnson, B. (2002). On the spiritual benefits of wilderness. *Int. J. Wilder.* 8, 28–32. Joyce, Y., and Bolderdijk, J. W. (2015). An exploratory study into the effects of extraordinary nature on emotions, mood, and prosociality. *Front. Psychol.* 5:1577. doi: 10.3389/fpsyg.2014.01577

Joye, Y., and Dewitte, S. (2016). Up speeds you down. awe-evoking monumental buildings trigger behavioral and perceived freezing. *J. Environ. Psychol.* 47, 112–125. doi: 10.1167/16.15.3

Kamitsis, I., and Francis, A. (2013). Spirituality mediates the relationships between engagement with nature and psychological wellbeing. *J. Environ. Psychol.* 36, 136–143. doi: 10.1016/j.jenp.2013.07.013

Kant, J. (1764/2008). *Observaciones Acerca Del Sentimiento De Lo Bello Y De La Sublime*. Madrid: Alianza Editorial.

Kaplan, R., and Kaplan, S. (1989). *The Experience of Nature: A Psychological Perspective*. New York, NY: Cambridge University Press.

Kaplan, S. (1995). The restorative benefits of nature. *Towards an integrative framework. J. Environ. Psychol.* 15, 169–182. doi: 10.1016/0272-4944(95)90001-2

Kaplan, S., and Kaplan, R. (2009). Creating a larger role for environmental psychology: the reasonable person model as an integrative development.
Keltner, D., and Haidt, J. (2003). Approaching awe, a moral, spiritual, and aesthetic emotion. Cogn. Emot. 17, 297–314. doi: 10.1080/02699930302297

Keirling, F., and Lee, H. (2008). Foundations of Behavioral Research, 4th ed. Fort Worth, TX: Harcourt College Publishers.

Levin, J., and Steele, L. (2005). The transcendent experience: conceptual, theoretical and epidemiological perspectives. Explore 1, 89–101. doi: 10.1016/j.explore.2004.12.002

Lorenzo-Seva, U., and Ferrando, P. J. (2006). FACTOR: a computer program to fit the exploratory factor analysis model. Behav. Res. Methods Instrum. Comput. 38, 88–91. doi:10.3758/BF03192753

Maslow, A. (1964). Religions, Values, and Peak Experiences. Available at www.bahaistudies.net/asma/peak-experience.pdf

Maslow, A. H. (1999). “Cognition of being in the peak experiences,” in Toward a Psychology of Being, ed. A. H. Maslow (New York, NY: Wiley), 81–111.

Mayer, F. S., and Frantz, C. (2004). The connectedness to nature scale: linking individuals’ connection with nature to environmental concern and behavior. Environ. Behav. 41, 715–740. doi:10.1177/0013916508318748

Nunnally, J. C. (1978). Psychometric Theory. 2nd Edn. New York, NY: McGraw-Hill.

Perkins, H. E. (2010). Measuring love and care for nature. J. Environ. Psychol. 30, 455–463. doi:10.1016/j.envp.2010.05.004

Piff, P. K., Dietze, P., Feinberg, M., Stancato, D. M., and Keltner, D. (2015). Awe, the small self, and prosocial behavior. J. Pers. Soc. Psychol. 108, 883–889. doi:10.1037/pspi0000018

Robbins, B. (2006). "An empirical, phenomenological study: Being joyful," in Qualitative Research Methods for Psychologists. Introduction Through Empirical Studies, ed. C. Fisher (Burlington, NJ: Academic Press), 173–211. doi: 10.1016/0956-7976(95)00010-7

Rudd, M., Vohs, K. D., and Aaker, J. (2012). Awe expands people’s perception of time, alters decision making and enhances well-being. Psychol. Sci. 25, 170–178. doi:10.1177/0956797612438731

Russel, J., and Feldman, L. (1999). Core affect, prototypical emotional episodes, and other things called emotion: dissecting the elephant. J. Pers. Soc. Psychol. 76, 805–819. doi:10.1037/0022-3517.65.5.805

Salgado, S., and Oceja, L. (2011). Towards a characterization of a motive whose ultimate goal is to increase the welfare of the world: quixotism. Span. J. Psychol. 14, 145–155. doi:10.5209/rev_SJOP.2011.v14.n1.12

Schroeder, H. (2007). Place experience, gestalt, and the human-nature relationship. J. Environ. Psychol. 27, 293–309. doi:10.1016/j.envp.2007.07.001

Seamon, D. (1984). Emotional experience of the environment. Am. Behav. Sci. 27, 757–770. doi:10.1177/000276484027006007

Seligman, M., and Csikszentmihalyi, M. (2000). Positive psychology. Intr. Am. Psychol. 55, 5–14. doi:10.1037/0003-066X.55.1.5

Shiota, M., Keltner, D., and莫斯man, A. (2007). The nature of awe: Elicitors, appraisals, and effects on self-concept. Cogn. Emot. 21, 944–963. doi: 10.1080/02699930600923668

Stern, P., Dietz, T., Abel, T., Guagnano, G., and Kalof, L. (1999). A value-belief-norm theory of support for social movements: the case of environmentalism. Hum. Ecol. Rev. 6, 81–97.

Stern, P., Dietz, T., and Guagnano, G. (1995). The new ecological paradigm in social-psychological context. Environ. Behav. 27, 723–743. doi:10.1177/0013916595276001

Stokols, D. (1990). Instrumental and spiritual views of people-environment relations. Am. Psychol. 45, 641–646. doi:10.1037/0003-066X.45.5.641

Talbot, J. F., and Kaplan, S. (1986). Perspectives on wilderness: re-examining the value of extended wilderness experiences. J. Environ. Psychol. 6, 177–188. doi:10.1016/0278-4946(86)90021-4

Van Cappellen, P., Saroglou, V., Iweins, C., Piovesana, M., and Fredrickson, B. L. (2013). Self-transcendent positive emotions increase spirituality through basic world assumptions. Cogn. Emot. 27, 1378–1394. doi:10.1080/02699931.2013.787395

Van Elk, M., Karinen, A., Specker, E., Stamkou, E., and Baas, M. (2016). ‘Standing in awe’: the effects of awe on body perception and the relation with absorption. Collabra 2, 1–16. doi:10.1525/collabra.36

Vining, J., and Merrick, M. (2012). “Environmental epiphanies: Theoretical foundations and practical applications,” in The Oxford Handbook of Environmental and Conservation Psychology, ed. S. Clayton (Oxford: Oxford University Press), 485–508.

Vining, J., Merrick, M., and Price, E. (2008). The distinction between humans and nature: human perceptions of connectedness to nature and elements of the natural and unnatural. Res. Hum. Ecol. 13, 1–11.

Williams, K., and Harvey, D. (2001). Transcendent experience in forest environments. J. Environ. Psychol. 21, 249–260. doi: 10.1006/jenv.2001.0204

Yaden, D. B., Haidt, J., Hood, R. W. Jr., Vago, D. R., and Newberg, A. B. (2017). The varieties of self-transcendent experience. Rev. Gen. Psychol. 21, 143–160. doi:10.1037/gpr0000102

Yaden, D. B., Iwry, J., Slack, K. J., Eichstaedt, J. C., Zhao, Y., Vaillant, G. E., et al. (2016). The overview effect: Awe and self-transcendence experience in space flight. Theory Res. Pract. 3, 1–11. doi:10.1037/cns0000086

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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