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Trait Appreciation of Beauty: A Story of Love, Transcendence, and Inquiry

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Abstract

This review of the trait of appreciation of beauty (AoB) draws from the literature in personality psychology, philosophy, religion, neuroscience, neuro-aesthetics, evolutionary psychology, and the psychology of morality. We demonstrate that AoB can be mapped onto a definition of appreciation that includes perceptual, cognitive, emotional, trait, virtue, and valuing elements. A classic component of defining beauty, unity-in-diversity, is described based on the works of a variety of major philosophers. We next describe that there are at least four channels of appreciation of beauty: natural beauty, artistic beauty, moral beauty, and beautiful ideas. Examining the neuro-aesthetics research indicates that many networks of the brain are involved in mental acts of appreciating beauty, but the medial orbital front cortex (mOFC) is implicated across all four channels of beauty. We then explain howhe trait of AoB is a member of three different families of traits: traits of love, traits of transcendence, and traits of inquiry. Next we briefly explain why Kant may have been more correct than Hegel concerning beauty and the good soul. We then present evidence that women may appreciate beauty somewhat more than men. Data from many cultures and nations consistently indicate this. After that we claim AoB leads to individual and collective flourishing. We examine and summarize studies that indicate appreciation of natural beauty leads to a wide variety of positive outcomes; we focus on the importance of open-mindedness that accompanies engagement with artistic beauty; and we summarize studies regarding the moral emotion of elevation and appreciation of moral beauty. Suggested future directions for research are embedded in each subsection of the paper.

Keywords: appreciation of beauty, natural beauty, artistic beauty, moral beauty, beautiful ideas

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[Beauty is] "central to human life….I came to view that in writing about beauty as a philosopher, I was addressing the deepest kind of issue there is….beauty is the only one of the aesthetic qualities that is also a virtue, like truth and goodness. It is not simply among the values we live by, but one of the values that defines what a fully human life means" (Danto, 2003, p. 14-15).

Although research on appreciation of beauty (AoB) has been relatively neglected (Howell, Diessner, & Robinson, 2017) there is an emerging corpus of research examining this emotion focused personality trait (Armstrong & Detweiler-Bedell, 2008). Although most researchers have referred to it as "appreciation of beauty," some have used "engagement with beauty" to emphasize the emotional involvement with beauty stimuli[1]. The plan for this paper is to organize most, if not all, empirical work on AoB, within a frame of theory. To begin, we will put forth tentative theoretical definitions of *appreciation* and *beauty*. Then we will develop six hypotheses generated by an integration of theory and empirical findings: (a) extant research can be mapped onto a definition of appreciation which includes elements of perception, cognition,

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[1] We will use "appreciation of beauty" (AoB) throughout the manuscript, except when we are referring to data generated by the Engagement with Beauty Scale (EBS; Diessner, Parsons, Solom, Frost, & Davidson, 2008; or the revised version, EBS-R, Pohling, Diessner, Iyer, Stacy, Woodward, & Strobel, 2018), in which case we will use "engagement with beauty," and use these abbreviations representing the subscales of the EBS and EBS-R: EnB = engagement with natural beauty, EaB = engagement with artistic beauty, EmB = engagement with moral beauty, EiB = engagement with beautiful ideas, and EBST = total score.

emotion, traits/states, virtue, and values, within a frame of *responsiveness* (Güsewell & Ruch, 2012a), (b) there are multiple channels through which we access experiences of beauty, including nature, art, morality, and ideas, (c) AoB has an international passport to belong to three families of traits: love, transcendence, and inquiry; (d) Kant may have been right over Hegel in regard to the goodness of responding to natural beauty vs. artistic beauty; (e) Women may be more appreciative of beauty than men; and (f) AoB leads to human flourishing.

Defining Appreciation

Haidt and Keltner (2004) define appreciation as "the ability to find, recognize, and take pleasure in the existence of goodness in the physical and social worlds" (p. 537). They go on to write, "the trait of being emotionally *responsive* to all forms of excellence, including beauty, [i]s appreciation" (p. 538; italics added). Güsewell and Ruch (2012a), accepting Haidt and Keltner's (2004) theoretical definition, have empirically demonstrated, through structural equation modeling, that indeed, responsiveness is the bottom line in appreciation, and that responsiveness generates multiple channels (physical natural beauty, physical artistic beauty, social moral beauty) of engagement with various forms of beauty.

Adler and Fagley (2005) have referred to appreciation as, "acknowledging the value and meaning of something—an event, a person, a behavior, an object—and feeling a positive emotional connection to it. Experiences of appreciation enhance positive mood and feelings of connection to the appreciated stimulus and/or to the nature of existence (i.e., as in a feeling of awe or wonder)….Appreciation is believed to have both state and trait qualities" (pp. 80-81).

Integrating these definitional elements from Haidt and Keltner (2004), Güsewell and Ruch (2012a), and Adler and Fagley (2005) indicates that appreciation has at least these relevant aspects: (a) perceptual (finding), (b) cognitive (recognize, acknowledge, aesthetic judgment), (c)

emotional, (d) trait/state, (e) virtue, and (f) valuing. Later in this paper we will map relevant theory and empirical findings onto these six elements of the responsive act of appreciating beauty stimuli.

A Major Definitional Component of Beauty

No authors of psychologically oriented AoB papers have had the hubris to try to define beauty. Indeed, as Sartwell (2004) writes, "beauty" is "famous as a word that should not be, and perhaps cannot be defined" (p. 3). Nonetheless, we are going to offer a definition, or at least describe a potential component of a definition of beauty: the concept of unity-in-diversity. Unity-in-diversity means that a variety of elements are organized into a meaningful whole. That is, the contents are the diversity and the form is the whole.

This criterion of beauty, unity-in-diversity, is a first principle. It is necessarily abstract, but let us examine some concrete examples of it. By definition ecosystems manifest unity-in-diversity. A forest has a wide range of diversity: trees, bushes, flowers, dirt, insects, other animals, fungi, etc. When we see the beauty of a forest we are seeing many diverse elements unified into a whole (the forest = the whole). Now imagine this forest clear-cut. Its diversity has plummeted, and the form of unity it once had is destroyed; it is now an ugly space.

Beethoven's Moonlight Sonata consists of various sounds unified into melodies. Now imagine how most people react to atonal music (e.g., Schoenberg), with its avoidance of conjunctive melody and avoidance of harmonic melodies, and thus avoidance of the kind of unity-in-diversity to which people are familiar. Most people find this lack of unity disturbing and non-beautiful (although we hold out the possibility that some people may find atonal music beautiful).

Why have Jackson Pollock's paintings and Mark Rothko's paintings been a challenge for the average person to find beautiful (of course, some people do find them beautiful)? One reason is a lack of unity-in-diversity. Pollock's drip paintings are full of diversity, but lack structure, although in theory, they are unified by his unconscious (he just dripped paint from a ketchup bottle, with no conscious unified plan for structure). To the untutored eye, they lack unity. Some of Rothko's paintings are on the other extreme – they are nearly a single color, with almost no diversity, except a little shading. To the uninitiated, Rothko's paintings appear boring; the lack of elements in his paintings is found unattractive by many (cf. Boyd, 2009). There appears to be no diversity to unify.

Many philosophers of aesthetics have denied that scents or flavors can be considered beautiful. Why? Because fragrances and tastes (may) lack unity-in-diversity. For example, Sibley (2001) and Beardsley (1975) debar tastes and smells from the entire field of aesthetics; their main argument being that an object of aesthetic experience "must exhibit patterning, structuring, or ordering of some kind" and this is "not possible with tastes and smells" (Sibley 2001, p. 226). This claim by Beardsley and Sibley is controversial and not all philosophers agree with them, but the point we are making is that solving this aesthetic problem of scents and flavors circulates around the criteria of unity-in-diversity.

What is moral beauty? Generally, it is defined as the human virtues and virtues are basically moral traits (Diessner et al., 2013). Virtues and traits are recognized through unity-in-diversity. After we have seen a person gregarious at school, talkative at work to customers and staff alike, and excited to go to parties, we think they are an extrovert – the term extrovert is shorthand for the unity of a variety of extroverted behaviors. When we call someone trustworthy, that word unifies a variety of behaviors, across a variety of situations, in which the person did

what they said they would do. When a person is brave at work, bold at school, and stands up for social justice at church (or temple or mosque), we unify those diverse behaviors by calling the person courageous. Thus moral beauty, through the virtues, is recognized by unity-in-diversity (Diessner, 2016).

We give one last example that combines a beautiful idea with moral beauty. The beautiful idea is the *oneness of humanity*. The moral beauty concerns a highly intelligent species, homo sapiens, and unity-in-diversity. Planet earth currently has many nations and many "races" of peoples of various colors. Currently there is much nationalism and racism on planet earth which causes disunity and is quite ugly. There is little hope of economic social justice, or solving the earth's pollution and climate change problems, without the nations and "races" uniting in harmony to solve these problems on a planet-wide basis. Evolving into a sane patriotism (loving one's country, but loving all humanity more) and tolerance (or better, love) for those of other races, would cause the diverse cultures to unite and serve the entire biosphere's needs. We are not urging uniformity here, we imagine all the different races, cultures, and nations to be metaphorically the many colored flowers of a single beautiful garden. Maintaining the identities of diverse cultures, while helping them learn to cooperate for a successful biosphere, is unity-in-diversity, and it is very beautiful. It is the next step in human evolution.

Plato believed that all beautiful things were unified. Etcoff (2000) summarized Plato's view of beauty: "Plato said that beauty resided in proper measure and proper size, of parts that fit harmoniously into a seamless whole [unity-in-diversity]" (p. 15). The neo-Platonist Plotinus (1964) wrote: "And on what has thus been compacted to unity, Beauty enthrones itself, giving itself to the parts as to the sum: when it lights on some natural unity, a thing of like parts, then it gives itself to that whole" (p. 143). Augustine (1964) noted in his *De Ordine*: "With regard to the

eyes, that is usually called *beautiful*, in which the harmony of parts is wont to be called reasonable . . .” (p. 175). And in his *De Musica*, “Beautiful things please by proportion . . .” and in visual beauty the parts must be “in harmony, *conguit*, with our eyes” (p. 191; note that proportion and harmony are near synonyms for unity-in-diversity)[2].

Marsilio Ficino (1964), renaissance philosopher, wrote “Beauty is, in fact, a certain charm which is found chiefly and predominantly in the harmony of several elements. This charm is threefold: there is a certain charm in the soul, in the harmony of several virtues; charm is found in material objects, in the harmony of several colours and lines; and likewise charm in sound is the best harmony of several tones” (p. 207). The British philosopher Francis Hutcheson is perhaps the most explicit in identifying unity-in-diversity as the cause of beauty. Dickie (1997) points out that Hutcheson reduced the cause of beauty to one particular principle: “uniformity in variety” (p. 14). John Dewey (1958) also explicitly attributes beauty to unity-in-diversity: “beauty is the response to that which to reflection is the consummated movement of matter integrated through its inner relations into a single qualitative whole” (p. 130). He goes on to note, “There is an old formula for beauty in nature and art: Unity in variety . . . The formula has meaning only when its terms are understood to concern a relation of energies . . . For the unity in variety that characterizes a work of art is dynamic” (p. 161).

Santayana (1961) considered beauty along two major lines, that of form and expression. In regard to form he wrote, “Beauty of form, however, is what specifically appeals to an aesthetic nature” and that form is “the unity of a manifold” (p. 77). Although Benedetto Croce

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[2] APA style discourages quotations in favor of paraphrasing, but the words of philosophers are their “data,” and we chose to liberally quote them.

(1960) primarily considered aesthetics and beauty in terms of his expressionist theory, he also focussed on both form and unity-in-diversity in regard to art: “Another corollary of the conception of expression as activity is the indivisibility of the work of art. Activity is a fusion of the impression in an organic whole. A desire to express this has always prompted the affirmation that the work of art should have unity, or, what amounts to the same thing, unity in variety. Expression is a synthesis of the various or multiple, in the one” (p. 20). Susanne K. Langer (1952), like Croce, developed a theory of aesthetics and art based on expressive form. She wrote: “Beautiful works . . . contain elements. The emergent form, the whole, is alive and therefore beautiful . . . Beauty is expressive form” (p. 396). Although Langer never explicitly defined beauty as unity-in-diversity, she does argue that integration of elements (diversity) into a whole (unity) is required for a work of art to become alive and beautiful. For example, she uses such phrases as, “unity which is generally considered the *sine qua non* of all good art” and “The inviolable unity of the total form . . .” (1967, p. 208). Iris Murdoch (1992) emphasized the importance of unity in art, when she stated, “All sorts of things have ‘aesthetic aspects’, but what I have in mind is the traditional concept (now under attack) of the unified work of art” (p. 2).

In summary, a variety of philosophers, across two and half millennia, consider unity-in-diversity as an important criterion for an experience of beauty. This view was reinforced in the field of psychology in a chapter entitled “The Psychology of Aesthetics” by Hans Eysenck (1957) in the middle of the 20th century. Eysenck invoked the concept of “unity in variety” (p. 327), and then elaborated on it by arguing that the aesthetic measure (M) of an object is the product of its complexity (C; similar to diversity) and order (O; its unity or structure): “M = C x O” (p. 329).

There are other candidates for definitions of beauty, such as *perfection*. Sartwell (2004), referring to classical philosophical conceptions of beauty, notes that Heinrich Wölfflin emphasized the Renaissance's goal of beauty as perfection, as well as Thomas Aquinas emphasizing perfection one of the required principles of beauty. There are likely other universal principles of beauty, besides perfection and unity-in-diversity. Sartwell describes such possibilities to include longing and desire, as well as the Hebrew *yapha* as glow or bloom, the Sanskrit *sundara* as holiness, the Greek *to kalon* as idea or ideal, the Japanese *wabi-sabi* as humility or imperfection, and the Navaho *hozho* as health or harmony. However, unity-in-diversity seems to be the most common definitional component of beauty, across various philosophers, in the Western canon.

To critique this notion of beauty as unity-in-diversity is to notice that everything in the macro-world (and perhaps in the micro-world) has form and content, that is, all things are made up of diverse elements into a whole, a unity: a molecule, a bacteria, a flower, a chair, a planet, a star, a human being, a cat, etc. Does this then devolve into meaninglessness? Apparently pop culture believes it to be meaningful, as this quotation, "Everything has beauty, but not everyone sees it," is cited thousands (millions?) of times on the internet, and typically attributed to Confucius (although this quote cannot actually be found in Confucian works; personal communication with Xiaowei Fu, Visiting Scholar at Harvard from Sichuan International Studies University, Chongqing, China, June 18, 2009). And it is not just pop culture that believes everything has the possibility of being seen as beautiful, but also major philosophers of beauty. Nehamas (2007) has written, "Beauty is everywhere" (p. 95). And Sartwell (2004) too, "It is, I think, in principle possible to experience the beauty of anything" (p. xii).

Thus, two challenges for future research would be to examine whether there are people who can or do see beauty in everything, and whether a study can be designed to empirically establish whether experiences of unity-in-diversity are typically found to be beautiful. It appears to be sufficient, but is it necessary?

Situating Beauty in the Western Canon

The three classical *ends* of human being, as elucidated in Western philosophy since at least the time of Socrates, are truth, beauty and the good (Plato, trans. 1937; viz. *The Republic*, Book VI, 505b-508e). These three teleological foci continue to inform human consciousness, they encourage reflection on the purpose of life, and influence pedagogical design (cf. Gardner, 1999, 2011). Philosophers and poets have often written about the relationships among beauty, truth, and the good. Keats' famous line: "Beauty is truth, truth beauty" (1819/1967; cf. Reber, Schwarz, & Winkielman's, 2004, hypothesis that the same psychological processes underlie judgments of truth and beauty). The existential psychologist Rollo May (1985) even determined that beauty is more important than either truth or the good in Plato's philosophy: "When Plato considered the great trilogy of Beauty, Truth, and Goodness, he placed Beauty at the top because Beauty is harmony, and whether Truth or Goodness are harmonious is the test of their integrity" (p. 27). However, in the last century the meanings of the concepts *truth, beauty* and *the good* have been relativized and deconstructed in the post-modern world. Nonetheless, these concepts continue to engage human beings, one way or another (Gardner, 2011).

The importance of beauty in living the good life has been under-appreciated in the last century in the Western world, and perhaps in most of the world (Danto, 2003; Howell et al., 2017). In the world of art, wherein one might expect that beauty would be substantially represented, most artists during the 20th century purposely avoided beauty (Danto, 1994). When

reviewing the three classic goals of the good life – truth, beauty, and the moral good – one finds that science, in the pursuit of true knowledge, has dominated Western discourse in the last century, and has brought humanity many gifts (and a few horrors). Science, however, like the field of art, has divorced itself from beauty, and there is little discourse on the elegance of beautiful proofs, or the sheer beauty of biological and chemical structures. Yet, at the beginning of this 21st century, the call to bring beauty back into art (Danto, 2003) and back into science (McAllister, 1996; Fitzpatrick, 2001) is being made. Nonetheless, in psychology, the study of the trait of AoB, and the psychology of beauty in general, continues to be under-represented in psychology journals compared to the quantity of publications in the domains of truth (e.g., cognition and knowledge and information processing) or the good (e.g., morality and ethics).

Truth, Science, and Beauty

McAllister (1996) makes a cause for the critical importance of beauty in science. Ranging from the use of beauty in determining theory choice, to issues of simplicity and elegance, to explanations of beauty as an attribute of truth, to the influence of symmetry in math and physics and biology, he makes it clear that concepts and experiences of beauty are crucial to the success and progress of science. He cites Einstein's son Hans, also a physicist, as stating that Einstein's "highest praise for a good theory or good piece of work was not that it was correct nor that it was exact but that it was beautiful (p. 96)." Zeki has provided fMRI data to show that when mathematicians' brains see an equation that they consider beautiful, the same part of the brain is activated as when we perceive a painting, or a piece of music, as beautiful (Zeki, Romaya, Benincasa, & Atiyah, 2014). However, despite this important connection between science and beauty, between seeking empirical truth and beauty, there are no studies by psychologists who have examined this domain.

McAllister (1996) also quotes the physicist Dirac as saying that "Einstein seemed to feel that beauty in the mathematical foundation was more important, in a very fundamental way, than getting agreement with observation" (p. 96). However, choosing between beauty and empirical power, in theory choice, may be a false dichotomy. As noted above, many philosophers ranging across Plato, Plotinus, Augustine, Ficino, Hutcheson, Schopenhauer, Dewey, Santayana, Croce, and Langer (viz. Diessner, 2007), have associated the concept of "unity-in-diversity" with beauty. Unity-in-diversity means that a variety of elements have organized into a meaningful whole. And when it comes to theory choice, a simple theory statement, that unifies many diverse observations, is generally considered the empirically best theory. Could it be that scientists are guided by an intuitive sense of beauty to select a theory that also unifies the most empirical observations? No psychologist has published research addressing this issue.

The Good, Morality, and Beauty

Kohlberg's (1984) theory of stages of moral reasoning dominated the field of moral psychology for the last half of the 20th century. Yet a search in PsycINFO reveals no empirical studies relating AoB to his work (Kohlberg x beauty, and moral reasoning x beauty, receive no hits for empirical studies). However, there is a study (Diessner, Davis, & Toney, 2009) that found a significant small positive correlation between the Defining Issues Test (Rest, 1979), which is based on Kohlberg's stages of moral reasoning, and engagement with beauty. That same study also found a significant but medium-sized correlation between the trait of fairness and the trait of engagement with beauty.

Kohlberg (1981) posited that understanding universal principles comprised the highest stage of moral reasoning. He also believed, invoking Plato, Kant, and Rawls, that justice was the most important moral principle. Although Kohlberg uses arguments based on reason and logic to

vindicate his highest stages of moral reasoning, perhaps beauty plays a role. When Plato (1937) argues in *The Republic* for justice as the highest principle, he describes justice in terms of unity-in-diversity. Plato notes that the just soul is one who has unified the three diverse elements of the human psyche: logiston (logic/reason), epithymia (appetite), and thymia (emotions or spirit). He then uses the just soul as a metaphor for a city ruled by justice, in which the diverse classes of philosopher kings, the warriors, and the producers are all given their due in a unified city. Thus, we see again that a central definition of beauty, that of unity-in-diversity, may be a guide to the highest moral principles. However, there has been no empirical research by psychologists to examine this.

Haidt's (2001, 2007) social intuitionist model of moral judgment has taken exception to Kohlberg's moral reasoning approach, arguing that people seldom perform dispassionate moral reasoning. Rather, they use their gut emotional reactions (intuitions) to make moral decisions, and then, if challenged, use moral reasoning like a lawyer, to argue for their initial gut reaction. Although Haidt's moral foundation theory does not directly address trait beauty, his work on the moral emotion of elevation does (e.g., Haidt, 2003). Elevation causes people to desire to become better human beings and, under the influence of elevation, to perform prosocial acts (Pohling & Diessner, 2016; Thomson & Siegel, 2017). The eliciting condition for elevation to occur is the observation of morally beautiful actions; and the higher one's level of trait engagement with moral beauty is, the more likely one will experience elevation (e.g., Diessner, Iyer, Smith, & Haidt, 2013; for a detailed discussion on elevation and trait AoB, see section below).

In summary, based on the most venerable virtues/values of the West (truth, beauty, and the good), the relationship between trait AoB and seeking the truth through science, or between AoB and seeking a life of moral goodness, have received very little empirical attention from

psychologists. Due to the importance of truth, beauty, and the good, as ideals that greatly influence our thinking and acting, this is a serious omission.

Hypothesis One

Research and Theory concerning AoB can be Mapped onto a Description of Appreciation

As noted above, by integrating definitional elements from Haidt and Keltner (2004), Güsewell and Ruch (2012a), and Adler and Fagley (2005), appreciation can be described as having these relevant aspects: (a) perceptual (finding), (b) cognitive (recognize, acknowledge, aesthetic judgment), (c) emotional, (d) trait/state, (e) virtue, and (f) valuing.

Perceptual aspect of Appreciation

A classical issue that bridges the perceptual to the cognitive is the ancient meme, "beauty is in the eye of the beholder." Sartwell (2016) tackles "Objectivity and Subjectivity" in the first section of his entry on Beauty in *The Stanford Encyclopedia of Philosophy*. He describes how a beauty experience cannot be totally subjective (not in the beholder's eye only) and cannot be totally objective (entirely a property of the object), but rather beauty "emerges in situations in which subject and object are juxtaposed and connected" (n.p., section 1). Sartwell then goes on to summarize Nehamas' (2007) view, "Nehamas, like Hume and Kant, though in another register, considers beauty to have an irreducibly social dimension. Beauty is something we share, or something we want to share, and shared experiences of beauty are particularly intense forms of communication. Thus, the experience of beauty is not primarily within the skull of the experiencer, but connects observers and objects such as works of art and literature in communities of appreciation" (n.p., section 1). Sartwell (2004) also argues that beauty is the feature of a situation that contains both a beholder and an object of beauty, "We give beauty to

objects and they give beauty to us; beauty is something that we make in cooperation with the world" (p. 5).

Thus a beauty experience simultaneously begins in both an object's existence and in our perception of it. This then begs the question of what kinds of perceptions can lead to experiences of beauty. Although many have argued that only the higher senses, sight and hearing, can produce beauty experiences (cf. Schindler, et al., 2017), Sartwell (2004) argues that all senses are open to beauty. He says if you don't believe that, ask a chef, weaver, or a perfumer. This disagreement could be addressed in future exploratory research through qualitative inquiry about what people find beautiful, and through fMRI studies examining whether potentially beautiful scents (jasmine, rose, etc.) or tastes (saffron?) fire neurons in the medial orbital frontal cortex (mOFC, see below, and Ishizu & Zeki, 2011).

Cognitive aspect of Appreciation

Although we will posit below that the beauty experience is primarily an emotional experience, nonetheless cognition is an important aspect of appreciation, and of AoB. Indeed cognitive appraisal theorists consider cognition an essential aspect of emotion (cf. Roseman, 1984). Haidt and Keltner (2004) emphasized "recognize" (p. 537) in their definition of AoB. Although many judgements of beauty happen quickly at the gut (emotional-intuitive) level (cf. Haidt's Social Intuitionist Model, 2001), sometimes judgements of beauty follow a careful cognitive examination and deliberation concerning the qualities of a stimulus (cf. Kahneman, 2011; Kant, 1987/1790). There are also aesthetic emotions, such as "interest," "intellectual challenge," and "insight" that have a strong cognitive basis to them (Schindler, et al., 2017, p. 27).

Emotional aspect of Appreciation

Many psychologists have framed an AoB experience as primarily an emotional experience (Armstrong & Detweiler-Bedell, 2008) or as experiences of specifically aesthetic emotions (Schindler, et al., 2017). Merriam-Webster's first definition of it is, "a *feeling*…of admiration, approval, or gratitude" (2017, n.p.; italics added).

Appreciation as a Trait

Most of the published research concerning AoB has examined or employed it as a trait (Diessner et al., 2008). It has been framed as a facet of the trait of Openness (Costa & McCrae, 1992) and as a trait-like character strength (Haidt & Keltner, 2004; Martínez-Martí, Hernández-Lloreda, & Avia, 2016).

Appreciation of Beauty as a Virtue

Aristotle (Sachs, 2002) considered beauty as an ultimate virtue, the virtue to which all other virtues aim; that is, the end (*telos*) of virtues, such as courage and justice, is beauty. In Positive Psychology, appreciation of beauty and excellence is considered a character strength which is closely aligned with the virtue of transcendence (Haidt & Keltner, 2004).

Beauty as a Value

Danto (2003) has written, "Beauty is an option for art and not a necessary condition. But it is not an option for life. It is a necessary condition for life as we would want to live it. That is why beauty, unlike the other aesthetic qualities, the sublime included, is a value" (p. 160). To appreciate beauty is to value beauty. Indeed, Martínez-Martí et al. (2016) define "appreciation" as "recognition of the value of something" (p. 2623). Values and traits are theoretically and empirically distinct, yet related (Roccas, Sagiv, Schwartz, & Knafo, 2002). Traits tend to be defined as relatively stable patterns of thoughts, emotions, and behavior; whereas values are typically described as fairly stable goals that are viewed as important to a person and guide one's

judgments, perception, and behavior, and can be categorized into a value hierarchy for each individual (Parks-Leduc, Feldman, & Bardi, 2015); nonetheless, some researchers consider traits and values as nearly synonymous (Lee & Ashton, 2004). The two most influential approaches to examining human values are the Rokeach Value Survey (RVS; Rokeach, 1973) and the Schwartz Value Survey (SVS; Schwartz, 1992). Both of those surveys employ "a world of beauty" as an item.

Hypothesis Two

Multiple Channels of Beauty Experience Include: Nature, Art, Morality, and Ideas

Beauty has been the central aesthetic concept for philosophers in the West since the dawn of philosophy (e.g., Aquinas, ca. 1260/1947; Aristotle, ca. 340 BCE/2002 CE; Augustine, 400/1964; Dewey, 1934/1958; Ficino, ca. 1475/1964; Hegel, ca.1835/1993; Kant, 1790/1987; Plotinus, ca. 250/1964; Santayana, 1896/1961; Schopenhauer, 1819/1969). Haidt and Keltner (2004) have noted that, "every culture has standards of beauty" (p. 550), and Brown (1991, 2000) has shown that beauty and aesthetics are valued across a very wide variety of cultures.

Beauty in Art and Nature

Western philosophers have described both the beauty of art and the beauty in nature (Beardsley, 1975; Croce, 1902/1960; Hofstadter & Kuhns, 1964; Mothersill, 1984; Santayana, 1896/1961; Sheppard, 1987). For instance, Augustine emphasized visual beauty in his *De Ordine* (1964) and auditory beauty in his *De Musica* (1964). Ficino agreed with Plato that the object of all love is beauty, including love for beautiful nature or beautiful art; he wrote, "When we say Love, we mean by that term the desire for beauty, for this is the definition of Love among all philosophers" (1964, p. 207). Dewey also emphasized beauty in nature and art (1934/1958, p. 161).

Moral Beauty

Concepts of moral beauty have arisenin religion and spirituality throughout historyand are still common topics in the world's extant religions (Haidt & Keltner, 2004). Religion and spirituality may continue to exert some effect on what humans consider beautiful, both artistically (Dahl, 1984; Kandinsky, 1912/1947) and morally; note how churches, mosques, and temples are still being built with awe inspiring beautiful architecture. Beauty, especially in its denotation of *glory*, is commonly found in the sacred texts of the world's religions and spiritual traditions. *Merriam-Webster's Third New International Dictionary* (Gove, 1993) defines "glory: 4a(1): great beauty or splendor" (p. 967). Many of the world's sacred books emphasize the role of beauty/glory: From the *Psalms* of Judaism, "Give unto the LORD the glory due unto his name; worship the LORD in the beauty of holiness" (29:2, King James version). In the *Bhagavad-Gita* of Hinduism is written, "Fain would I see, as thou Thyself declar'st it, Sovereign Lord! The likeness of that glory [great beauty] of Thy Form wholly revealed. O Thou Divinest One!" (chap. 11, no p., E. Arnold edition). From the Muslim *Qur'án*, "And he said, 'Truly do I love the love of good, with a view to the glory [great beauty] of my Lord'" (38:32; Yusuf Ali edition). From the Christian *Bible*, "And the Word was made flesh, and dwelt among us, (and we beheld his glory [great beauty], the glory as of the only begotten of the Father,) full of grace and truth" (*John*, 1:14). In the Buddhist *Dhammapada*, "At all times, by day and by night, the Buddha shines in his glory [great beauty]" (chap. 26, no p., J. Richards edition). In the Bahá'í *Seven Valleys*, "In every face, he seeketh the beauty of the Friend" (p. 7, Bahá'í Publishing Trust edition).

The concept of moral beauty has been addressed in philosophy at least since the time of Aristotle. Sachs (2002) has argued that *to kalon*, which means 'the beautiful,' has mistakenly

been translated as ‘noble’ in most translations of Aristotle’s *Nichomachean Ethics*. Aristotle postulated that all human virtues are morally beautiful. Sachs notes that the beautiful, as described by Aristotle, is more than just an object for philosophic contemplation, it is the main source of moral action. A person of good character is one who habitually uses the moral virtues to guide their actions, knowing that the beautiful is the end or highest good of human behavior.

In psychology, moral beauty has had an explosion of research due to it being the eliciting stimulus of the relatively recently identified moral emotion of elevation (Haidt, 2003; Pohling & Diessner, 2016; Thomson & Siegel, 2017; see the section below on elevation and trait appreciation of moral beauty).

Beautiful Ideas

Besides the three more obvious domains of natural beauty, artistic beauty, and moral beauty, there is the possibility of ideational beauty: the realm of beautiful ideas. This refers to the experience of beauty in the face of philosophical ideas, political ideas, religious or spiritual ideas, scientific or mathematical ideas. Such ideas can be for instance a grand theory (philosophy, science), a revolutionary way to order the world and solve human problems (politics), or an approach to the ontology of the universe, the existence of humanity, and/or the nature and function of the human mind (religion and spirituality). Research on the personality trait of engaging with beautiful ideas is in its infancy (Pohling et al., 2018). Seminal work on the beautiful ideas of mathematicians has been done by Zeki, Romaya, Benincasa, and Atiyah (2014).

After the initial construction of the Engagement with Beauty Scale (Diessner et al., 2008) and its original three subscales of natural, artistic, and moral beauty, Jonathan Haidt pointed out that brain studies are needed to determine how the brain processes different beauty stimuli rather

than relying on philosophical guesses of which domains are distinct (Haidt personal communication, January 18, 2006). At this point in time, there are now a variety of studies that have done so.

Evolutionary Psychology and Neuroaesthetics

Neuroaesthetics and evolutionary psychology are in their infancy but are very important fields for understanding appreciation of beauty. As Chatterjee (2014) has emphasized, neuroaesthetics will tell us how we appreciate beauty, and evolutionary psychology will tell us why. Although there are variety of ways to study brain function, the most common is functional magnetic resonance imaging, fMRI. When neurons are active, blood flows to them, and fMRI detects the blood flow, thus allowing mapping of which neurons are firing in the brain when being exposed to stimuli (such as paintings, music, scenes from nature, or stories of moral goodness). As Chatterjee (2014) has written, and Barrett (2017a, 2017b) would agree, there are no neural networks (or brain modules) that are dedicated to aesthetics. Brains appear to have ensembles of various neural subsystems that combine in flexible ways to provide us with aesthetic experiences (Starr, 2013). Nonetheless, much of the research in neuroaesthetics has focused on hunting for the fingerprints in the brain of our perceptual, emotional, and cognitive responses to aesthetic stimuli, i.e., trying to identify the most common neural structures involved in aesthetic and beauty experiences. In the section below we will take a linear approach, and simply describe the regions in the brain that have been implicated when appreciating natural beauty, artistic beauty, moral beauty, and beautiful ideas.

The Brain on Beauty

Ishizu and Zeki (2011) have put forward a provocative brain-based theory of beauty (Semir Zeki coined the word “neuroaesthetics” in the 1990s). Their theory integrates a wide

variety of studies using brain-imaging techniques in regard to beauty, and especially rely on their own studies of how visual beauty (paintings) and musical beauty are processed in the brain. They propose "that all works that appear beautiful to a subject have a single brain-based characteristic, which is that they have as a correlate of experiencing them a change in strength of activity within the mOFC [medial orbital frontal cortex] and, more specifically, within field A1 in it" (p. 8). It seems that the mOFC is the one brain area that all forms of beauty experiences may activate, although different forms of beauty also influence and activate other areas of the brain, as will be described below; and even the same form of beauty may activate differing neural subsystems, depending on the context of the stimuli and the form of research design (cf. Barrett 2017a, 2017b). In a recent review of the neuroscience of aesthetic appreciation, evidence is presented for both domain generality for when the brain processes aesthetics, and also considerable domain specificity (Jacobsen & Beudt, 2017).

Natural beauty. We could not find empirical studies using brain-imaging techniques with scenes explicitly identified as natural beauty. However, one fMRI study came close, examining place attractiveness with photos of scenes of nature, such as swamps, mountain ranges, fields, beaches, and forests. That study found natural place attractiveness to be primarily processed in the ventromedial primary frontal cortex (vmPFC); the study also indicated that there is overlap in vmPFC for evaluating attractive faces. This indicates that vmPFC may be processing the beauty and aesthetics of such diverse stimuli as places and faces (Pegors, Kable, Chatterjee, & Epstein, 2015). To add to this diversity, moral beauty processing has also been found in the PFC (Englander, Haidt, & Morris, 2012; Piper, Saslow, & Saturn, 2015). On the other hand, there are differences, with higher response for facial beauty in the lateral orbital frontal cortex (latOFC) than for place attractiveness (Pegors et al., 2015).

There are also two fMRI studies comparing images of urban/built environments with the natural environment; both studies found the nature/rural scenes to evoke positive emotions and the urban scenes to evoke feelings of threat (Kim, Jeong, Baek et al., 2010; Kim, Jeong, Kim et al., 2010). But, as we don't know whether the subjects found the natural or urban scenes beautiful, neutral, or ugly, we cannot draw direct conclusions relative to AoB. However, one of these two studies did show that rural scenes activated the caudate nucleus (among other places in the brain; Kim, Jeong, Baek et al., 2010), and a study regarding the beauty of paintings also implicated that area of the brain (Vartanian & Goel, 2004). The other study (Kim, Jeong, Kim et al., 2010) indicated that natural scenes activated the occipital gyri and precuneus (among other places), and the occipital gyri have also been to found activate when viewing paintings that subjects considered beautiful (Vartanian & Goel, 2004); and the precuneus activates for moral beauty (Englander et al., 2012). In terms of discrimination, the urban scenes activated both the hippocampus and the amygdala (Kim, Jeong, Baek et al., 2010; Kim, Jeong, Kim et al., 2010), which is uncharacteristic of viewing any form of beauty, other than in one study in which viewing sculpture aroused the amygdala (Di Dio, Macaluso, & Rizzolatti, 2007).

Artistic beauty. Using fMRI, brains have been examined experiencing both representational and abstract paintings and the participants then rated the paintings in regard to their aesthetic attractiveness. It was found that activation in the right caudate nucleus decreased in response to decreasing preference, and that activation in the bilateral fusiform gyri, the bilateral occipital gyri, and left cingulate sulcus increased in response to increasing preference (Vartanian & Goel, 2004).

Another study using fMRI methods exposed subjects to images of classical and renaissance sculpture (Di Dio et al., 2007). It was found that observing these sculptures

produced activation of the right insula as well as of some lateral and medial cortical areas (lateral occipital gyrus, precuneus and prefrontal areas), which they considered an objective beauty response (note that the prefrontal cortex is close to the orbital frontal cortex that Ishizu and Zeki [2011] hypothesize is the main area for processing beauty). Activation of the amygdala was also found, which was considered an emotional subjective experience of sculptural beauty stimuli.

The neural correlates of judgments of beauty of geometrical shapes has been studied with fMRI (Jacobsen, Schubotz, Höfel, & Yves v. Cramo, 2006). Subjects were asked to determine if a shape was beautiful or not (evaluative aesthetic judgments) and whether the shape was symmetric or not (descriptive judgments). The symmetry judgments activated parietal and premotor areas related to spatial processing. The evaluative judgements activated the frontomedian cortex (near the OFC), bilateral prefrontal, posterior cingulate, left temporal pole, and the temporoparietal junction.

In another study participants classified a variety of paintings (portraits, landscapes, still lives, and abstract compositions) as beautiful, neutral, or ugly. Then, using fMRI, the participants viewed the same paintings while in the scanner. The results showed that the orbito-frontal cortex (OFC) had stronger activation for beautiful than ugly paintings and the reverse for the motor cortex; that is, the motor cortex was activated more strongly by the ugly paintings than the beautiful (Kawabata & Zeki, 2004). More recent work also points to the OFC being a major processing station for aesthetic judgment (Ishizu & Zeki, 2013).

Sad beautiful, and joyful beautiful, photographs are both processed by the mOFC. Employing pictures from such volumes as *The Family of Man*, *The Modern Century*, and *The Great LIFE Photographers*, subjects rated 800 pictures for their subjective experience of the aesthetics (from beautiful to ugly) and emotionality of the photos (very joyful to very sorrowful).

The researchers then selected 120 of the 800 photos, that well represented the four categories of ugly, neutral, joyful beauty and sorrowful beauty, and showed them to the participants while they were in the fMRI machine. They found that both sorrowful and joyful beauty lit up the mOFC, but that joyful beauty had a stronger response in the mOFC than did sorrowful beauty; outside the mOFC the joyful beauty stimuli were processed in areas linked to positive emotions and the sorrowful beauty in areas linked to negative experiences (Ishizu & Zeki, 2017).

Moral beauty. Consonant with Ishizu and Zeki's (2011) brain based theory of beauty, increased activation in the medial OFC for both beautiful faces and for morally beautiful actions (and decreased activation in the insular cortex for both) has been found (Tsukiura & Cabeza, 2011). The researchers concluded that this evidence supports the stereotype of "beauty-is-good" (p. 138). Similarly, another study found the OFC has been implicated in perceptions of both facial beauty and moral beauty, as well as activation in the inferior temporal gyrus and the medial superior frontal gyrus for both (Wang et al., 2014). The researchers in this latter study concluded, however, that "compared with facial beauty, moral beauty spanned a larger-scale cortical network, indicating more advanced and complex cerebral representations characterizing moral beauty" (p. 814). Likewise, other studies using fMRI have found that admiring morally beautiful actions is associated with activation in the OFC (Takahashi et al., 2008).

Besides the OFC, the other major locations of brain activity when noticing the moral beauty of others are the medial prefrontal cortex (mPFC; Englander et al., 2012; they also correlated moral beauty with the precuneus, and insula) and the posteromedial cortices (PMC; Immordino-Yang, McColl, Damasio, & Damasio, 2009).

Beautiful ideas. There appears to be only one brain imaging study related to engagement

with beautiful ideas. Fifteen mathematicians rated mathematical formulas as beautiful, ugly, or neutral before undergoing fMRI. Activation in the brain for the subjectively rated beautiful formulas was found in field A1 of the medial orbito-frontal cortex (mOFC; Zeki et al., 2014).

Beauty is both pacific and energizing. Employing measurements of heart rate (HR), respiratory sinus arrhythmia (RSA), and medial prefrontal cortex (mPFC) activity, by using functional near-infrared spectroscopy (fNIR), the emotion of elevation was studied during exposure to moral beauty (Piper et al., 2015). Besides finding mPFC activity during the state of elevation, it was also demonstrated that experiencing elevation involves an unusual activation of both the sympathetic and parasympathetic nervous systems (Piper et al., 2015). This might not surprise philosopher of aesthetics Elaine Scary (1999) who noted that "[b]eauty quickens. It adrenalizes" (p. 24); but also that "[b]eauty is pacific" (p. 107). This view is echoed by existential psychologist Rollo May, who defined beauty as involving both joy and peace, "[o]ther happenings give us joy and afterwards a peace, but in beauty these are the same experience. Beauty is serene and at the same time exhilarating" (p. 20). That beauty may be both arousing and calming, simultaneously, calls for further study: only one brain study has noted this (Piper et al., 2015), and no qualitative investigation of persons' noticing that it is both pacific and energizing have been published.

Cautionary note. Based on Barrett's (2017a, 2017b) theory of constructed emotion we feel cautious about the hunt for a particular fingerprint of any emotion in the brain, including the emotional experience of appreciating beauty. Her review of research indicates that variability is the norm and that it is not possible to reliably measure an emotion from facial expression, autonomic activity, or specific patterns of neural firing. Degeneracy rules the day in the brain, that is, dissimilar brain systems and processes can give rise to identical functions (and emotional

experiences). Based on the role of interoception (the brain reading signals from throughout the body) in Barrett's theory of emotion, an important future direction for research would be to identify the interoceptive features and influences of an appreciation of beauty experience (T. Ishuzu, personal communication, November 12, 2017).

How many Traits of Appreciation of Beauty? A Summary

In summary, although a variety of brain regions respond to experiences of beauty, the mOFC is the most consistently found to do so across domains of beauty: beautiful paintings, beautiful music, human facial beauty, moral beauty, and beautiful math ideas. It appears these results are somewhat analogous to the factor analytic studies performed on the Engagement with Beauty Scale (Diessner et al., 2008; Pohling et al., 2018). All subscales, representing somewhat different traits of engagement with beauty correlate fairly highly with the overall EBS total score, similar to the mOFC processing various different forms of beauty stimuli. Likewise each different form of beauty that has been studied with fMRI has a somewhat different activation pattern in the brain, lighting up some parts of the brain that are not in the mOFC, somewhat analogous to the subscales on the EBS tapping different traits of engagement with beauty (natural, artistic, moral, ideational). But how many traits of AoB are there? We do not know. We note that facial beauty and moral beauty are processed in similar parts of the brain, but what about sexual attraction beauty? Because sexual selection is so essential in evolution (Etcoff, 2000), it is probably a primary form of AoB. However, it is not included in the EBS-R nor in fMRI studies of beauty. Clearly further research needs to be done to determine how many and which traits make up the family of AoB traits. On the other hand, as there seem to be "multiple channels through which we connect with beauty and excellence" (Güsewell & Ruch, 2012a, p.

526; cf. Haidt & Keltner, 2004, p. 538), maybe it is neither important nor possible to empirically separate them all, as each individual has his or her own access to a world of beauty.

For further research on mapping the relationship between aesthetic personality traits and brain functions we recommend use of The Desire for Aesthetics Scale (Lundy, Schenkel, Akrie, & Walker, 2010). The items from this scale address a very wide range of aesthetic interests, including beauty, has proven reliable, and is recommended for use at the International Network for Neuroaesthetics website.

Evolutionary Psychology and AoB

As mentioned above, neuroaesthetics explains the how of appreciating beauty, and evolutionary psychology explains the why (Chatterjee, 2014). We have evolved to admire beauty for two main reasons, natural selection/adaptation and sexual selection. In regard to natural beauty, most evolutionary psychologists evoke natural selection: our ancestors found places that were supportive of life as beautiful. Thus places with a vista (for safety and for finding game and plant-based food), with water features and with greenery, helped our ancestors stay alive and reproduce; and we still find these features beautiful (Dutton, 2009; Chatterjee, 2014). That which we find beautiful in human bodies and human faces is partly based on sexual selection and partly on natural selection. Large eyes, lustrous hair, and an hour-glass figure are fitness indicators that men find beautiful in women; prominent brows, square chin, and a V-shaped body are fitness indicators that women find beautiful in men (Etcoff, 2000; Chatterjee, 2014). Women and men who have these qualities are perceived as likely to produce strong babies who will survive and later reproduce.

The evolution of our attraction to artistic beauty is more controversial. Although Dutton (2009) has argued we have an instinct to create and appreciate art, Chatterjee (2014) has shown,

at least in terms of the biological concept of an instinct, that we have no such an instinct. We do have instincts related to appreciating art, such as an instinct for pleasure, and much art brings us pleasure (Chatterjee, 2014). It is possible that some aspects of artistic beauty are adaptive. For instance, story-telling, which may be the root of such arts as novels, plays, movies, operas, and poetry, was almost certainly being enacted in the Pleistocene. Dutton (2009) notes at least three ways in which such story telling art may be adaptive: a) stories prepare us for life and its surprises, b) they are didactic and richly instructive, and c) they encourage interpersonal intelligence regulation of social behavior. It is also possible that the beauty of the arts are by-products of adaptations. Dutton (2009) and Chatterjee (2014) both invoke Pinker's (1997) example of cheesecake. We didn't evolve a liking for cheesecake, we evolved to like fat and sugar, and cheesecake is a modern by-product of the adaptation of being attracted to fat and sugar. Pinker (1997) calls music cheesecake for the ears; it's a by-product of our adaptive need for emotional processing and auditory analyses. There is also the possibility that performing an art (dancing, story-telling, playing a musical instrument, singing, etc.) is a fitness signal, and that sexual selection plays a role here. We want to procreate with mates that display such fitness signals.

There seems to be an emerging consensus that sexual selection has played an important role in shaping human morality, and thus moral beauty. Dutton (2009) was so bold as to claim that courtship, in particular women selecting men for mates, has "done more to create the human personality as we know it today than any other single evolutionary factor" (p. 140). Chatterjee (2014) notes that women have selected men who appear less domineering and more likely to provide in the long term for their children. Prum (2017) is also emphatic that women have

sexually selected long-term mates for their moral beauty, specifically such traits as kindness, empathy, thoughtfulness, honesty, and loyalty.

There are plenty of critics of the current state of evolutionary psychology; for instance, Prum (2017) calls much of it “bad science” (p. 227), and gives a variety of arguments, and citations to empirical work, to support that evaluation. For example, one of the classic arguments in evolutionary psychology is that in sexual selection, men and women have both aimed to choose mates with facial and body symmetry. Prum provides reasons and data for why this is not true, such as noting that some of most sexually idolized females (Marilyn Monroe, Madonna, and Cindy Crawford) have symmetry defying facial moles, and that many hairstyles create and enhance facial asymmetries. He also points out that such a symmetry theory regarding sexual selection in birds was soundly rejected in the 1990s by evolutionary biologists. Gardner (2011) is likewise a critic of evolutionary psychology in regard to the “why” of beauty. He mainly argues that culture is so powerful regarding notions of beauty that it has far transcended any small influence that genetics could have. Starr (2013) has argued that evolutionary psychology is a poor foundation for neuroaesthetics due to the high degree of variability in modern human tastes, and that it impoverishes our experiences of beauty by reducing complex aesthetic emotions to crude drives.

Nonetheless, it seems likely, from the findings of evolutionary psychology, that the trait of appreciation of beauty has been molded through natural selection and sexual selection. But we need to be cautious in our claims about how and why that has occurred.

Hypothesis Three

AoB has Membership in Three Families of Traits: Love, Transcendence, and Inquiry

Plato considered beauty to be the object of all forms of love (Nehamas, 2007); however, Peterson and Seligman (2004), in mapping the virtues and characters strengths of positive psychology, placed AoB within a grouping of transcendent traits/character strengths, and not in the family of humanity/love strengths. Some empirical evidence from psychological research has indicated it may better belong in a family of traits related to love (cf. Diessner, et al., 2013); whereas other researchers have emphasized AoB as a trait of transcendence (cf. Martínez-Martí et al., 2015).

Transcendence and Appreciation of Beauty

Peterson and Seligman (2004) considered the transcendent character strengths to include "Appreciation of Beauty and Excellence [Awe, Wonder, Elevation];" "Gratitude;" "Hope [Optimism, Future-Mindedness, Future Orientation];" "Humor [Playfulness];" and "Spirituality [Religiousness, Faith, Purpose" (p. xi). This grouping was based on theoretical assumptions, and not based directly on empirical classification, such as factor analysis (McGrath, 2015). They described transcendent traits as forging connections to the larger universe and providing meaning to life. Spirituality was conceived as the prototype of the transcendent family of strengths, due to its commitment to the nonmaterial aspects of being, "whether they be called universal, ideal, sacred or divine" (Peterson & Seligman, 2004, p. 519). Haidt and Keltner (2004) wrote the chapter on Appreciation of Beauty and Excellence (ABE) in Peterson and Seligman's (2004) handbook about character strengths and virtues, and described ABE as "the ability to find, recognize, and take pleasure in the existence of goodness in the physical and social worlds" (p. 537). Haidt and Keltner proposed three types of goodness: (a) physical beauty, such as visual art and music, (b) skills and talents, (c) moral goodness or virtues. They considered (a) and (c) to be

objects of the appreciation of beauty (i.e. goodness in the physical and social worlds) and (b) as the non-moral object of appreciation of excellence.

Martínez-Martí et al. (2016), working under the assumption that Peterson and Seligman (2004) correctly categorized AoB as a strength of the virtue of transcendence, report evidence that people who score high in appreciation of beauty and excellence "are generally high in self-transcendence, i.e., they tend to get absorbed and to lose awareness of time and self, experience a strong relationship with nature and the universe, feel that everything seems to be part of a living organism, and can often feel vitalized and comforted by spiritual experiences" (p. 18). Their empirical investigation included administering to participants the Self-transcendence Scale of the Cloninger Temperament and Character Inventory (Cloninger, Przybeck, Svrakic, & Wetzel, 1994), which had large correlations with Martínez-Martí et al.'s (2016) appreciation of beauty subscale and their appreciation of moral excellence (beauty) subscale, indicating that AoB is strongly related to transcendence.

The Spiritual Transcendence Scale (STS; Piedmont, 1999) has been found to correlate moderately with the Engagement with Beauty Scale (EBS; Diessner et al., 2008)). Likewise with gratitude (Watkins, Woodward, Stone, & Kolts, 2003), presumably a transcendent trait (Peterson & Seligman, 2004), the EBS showed moderately high correlations. In another study (Diessner et al. 2013), with a large internet sample, the GQ6 measure of gratitude (McCullough, Emmons, & Tsang, 2002) was moderately correlated with engagement with natural beauty, with artistic beauty, and with moral beauty. In a German sample of participants with medical and psychiatric diagnoses, a large correlation between a sense of gratitude and AoB was found, as well as a moderate correlation between experiencing awe and appreciating beauty (Büssing et al., 2014). With another German speaking sample a large correlation between a measure of awe and the

EBS total score was shown (Güsewell & Ruch, 2012a). In yet another study, this one with German speaking musicians and non-musicians, a measure of awe showed a large correlation with general appreciation of beauty and excellence, a large correlation with appreciation of natural beauty, and a medium correlation with appreciation of artistic beauty (Güsewell & Ruch, 2014). In that same study, using a German form of the Tellegen Absorption scale (absorption may be framed as a form of transcendence), large correlations were found between absorption and general appreciation of beauty and excellence, and with appreciation of natural beauty and a medium correlation with appreciation of artistic beauty. Relevant to this, Haidt and Keltner (2004) wrote that "the history of aesthetics suggests that one of the keys to understanding appreciation is to understand that works of art and drama have the capacity to create a state of deep absorption, which is experienced as a kind of self-transcendent journey into another world" (p. 541).

Hope, another transcendent trait, has shown a small significant correlation with total EBS score and a medium sized significant correlation with EmB (Diessner, Rust, Solom, Frost, & Parsons, 2006).

There is also empirical evidence that the trait of appreciation of moral beauty is a self-transcending trait. The major emotional response to observing acts of moral beauty is the moral emotion of elevation (Haidt, 2003). Along with awe and gratitude, elevation is considered a self-transcendent moral emotion since it was found that elevation leads to transcending the self psychologically by inducing an expanded awareness of thinking about and attention to other people, physiologically by inducing bodily reactions that are associated with the human affiliation system, and motivationally by prompting prosocial or even altruistic intentions and behavior (cf. Pohling & Diessner, 2016; Shiota, Thrash, Danvers, & Dombrowski, 2014).

In summary, in regard to individual flourishing, the trait of AoB is strongly associated with such transcendent traits as gratitude, spiritual transcendence, self-transcendence, absorption, and dispositional awe, and somewhat with trait hope.

Love and Appreciation of Beauty

Peterson and Seligman (2004) consider love to be a strength of the Virtue of Humanity (one of the six virtues of their VIA schema) and is manifest in our caring relationships and as a disposition to tend and befriend. The trait of EmB is highly associated with love, and in particular with universal love of all humanity (Diessner et al., 2013). Based on Haidt's moral foundation work (Graham et al., 2011), the Care foundation is the most closely related to love, and EmB moderately correlated with it, whereas its correlations with the other four foundations were quite low (Diessner et al., 2013). The dominant Five Factor personality trait (FFM), for those high in the trait of EmB, is Agreeableness (Diessner et al., 2013), and of the Big Five traits, Agreeableness best represents compassion and love (DeYoung, Weisberg, Quilty, & Peterson, 2013). EmB correlated with the other four FFM traits with low to negligible associations.

The Different Types of Love Scale (DTLS; Campos, Keltner, & Gonzaga, 2002), when correlated with the EBS, showed large correlations between a love of all humanity and the EnB and EmB subscales, and a medium correlation with EaB (Diessner et al., 2013). Whereas the other three subscales of the DTLS, measuring love of (a) romantic partners, (b) friends, and (c) family showed low, but significant, correlations with the natural, artistic, and moral beauty subscales of the EBS. Empathic concern (Davis, 1983), generally considered a necessary but not sufficient condition for love and compassion, showed a large correlation with EmB and medium correlations with EnB and EaB, with a large internet sample (Diessner, et al., 2013). Likewise, the Identification with all Humanity scale (McFarland, Webb, & Brown, 2012), whole world

subscale, demonstrated medium correlations with EnB, EaB, and EmB with a large internet sample (Diessner et al., 2013).

Structural modeling was used to test whether EmB fit better with a cluster of transcendent traits or with a cluster of love oriented traits. The results indicated that EmB fit the best with dispositions related to love; whereas EnB was the best fit for the dispositions related to transcendence (Diessner et al., 2013). We cautiously note that this makes post hoc sense: moral beauty is primarily concerned with the virtues of humans and, in the measures used above, the love items were concerning humans loving each other. The awe that accompanies appreciation of natural beauty is a prototype of transcendence. Yet, this may be a false dichotomy.

Is love a transcendent trait (and emotion and value)? Perhaps trying to categorize AoB as *either* a transcendent *or* a love trait is an error. Love typically involves other-focus that includes decreased selfishness and transcending self (for the concept of selflessness and its associated constructs, see in detail Dambrun & Ricard, 2011). Perhaps love is the greatest form of transcendence. It seems the Greek agapic love in Christianity and the Pali metta (compassion) of Buddhism would be examples of love being a major transcendent trait or ability.

Schwartz (1992) states that the combination of the two basic values, universalism and benevolence, make up an overarching value of "self-transcendence" (p. 45); "universalism and benevolence-both are concerned with enhancement of others and transcendence of selfish interests" (p. 15). Although he frames these two values as signs of transcendence, they also appear to be love-oriented values. He defines the benevolence value as a "concern for the welfare of close others in everyday interaction" (Schwartz, 1992, p. 11), in other words, loving locally, and the universalism value as focused on "understanding, appreciation, tolerance, and protection for the welfare of all people and for nature" (p. 12), which could be viewed as loving globally, an

agapic love for humanity and all other creatures. The values on the Schwartz Value Survey (SVS; Schwartz, 1992) that comprise benevolence are: helpful, responsible, forgiving, honest loyal, mature love, and true friendship. The SVS items that comprise universalism are: protecting the environment, unity with nature, a world of beauty, broad-minded, social justice, wisdom, equality, a world at peace, and inner harmony. This implies that love is a transcendent value based on Schwartz's approach.

As just noted, Schwartz's Value Scale (SVS; 1992) contains the item "a world of beauty (beauty of nature and the arts)" as one of the nine value items that comprise the basic value of universalism. A search of the literature reveals no studies that focus on the single value of world of beauty; although there are many studies examining issues related to the value of universalism and/or benevolence. For instance, in regard to engagement with beauty, Schwartz's benevolence value showed significant medium correlations with the traits of EnB, EaB, and with EmB. Likewise, the value of universalism significantly and moderately correlated with EnB, EaB, and EmB (Diessner et al., 2013). These data reflect the connections among love, AoB, and transcendence.

In conclusion we reject the either/or focus of Diessner et al. (2013) in which they asked whether AoB was a better fit for a family of love traits or a family of transcendent traits. It seems to be a false dichotomy. Love is a crucially important form of transcendence. AoB is highly and strongly associated with both love and transcendence.

Appreciation of Beauty as a Form of Inquisitiveness

The factor structure of the Values In Action questionnaire (VIA; Peterson & Seligman, 2004) has been analyzed with a remarkable sample size of N = 1,076,549 (McGrath, 2015). The original VIA schema consisted of six major virtues, Knowledge/Wisdom, Justice,

Love/Humanity, Courage, Temperance, and Transcendence, with each virtue respresenting a variety of character strengths. McGrath's (2015) factor analytic study has revealed three major factors/virtues of the VIA, which he has labelled Inquisitiveness, Caring, and Self-Control. This Inquisitiveness factor includes the character strength of Appreciation of Beauty and Excellence. Although in terms of beauty's connection to love, it is worth noting that the Appreciation of Beauty and Excellence subscale had a .41 loading on McGrath's Caring factor and that is not much different from its loading of .44 on the Inquisitiveness factor, once again indicating that AoB is strongly connected to loving care. AoB had a negligible -.01 loading on the Self-Control factor. In a later analysis of similar data it was found that the Appreciation of Beauty and Excellence subscale had a mean loading of .47 on the Caring factor and .49 on the Inquisitiveness factor (McGrath, Greenberg, & Hall-Simmonds, 2017).

In summary, in terms of individual human flourishing, it appears that AoB is intimately connected to love, to transcendence, and to inquisitiveness. However, other than the two studies by Zhang and colleagues (Zhang, Howell, & Iyer, 2014; Zhang, Piff, Iyer, Koleva, & Keltner, 2014) concerning how engagement with natural beauty mediates and moderates the many positive outcomes of nature affiliation, we know very little about the causal relationships among AoB, traits of love, traits of transcendence, and traits of inquisitiveness. Research studies in those directions are highly warranted.

Hypothesis Four

Evidence Indicates Kant was right over Hegel Concerning the Good Soul

Kant argued that it was important to differentiate a love of artistic beauty from a love of natural beauty (Baxley, 2005). Kant concluded that appreciating the beautiful in art provided no evidence that someone was a good human being. On the other hand, he was convinced that

engaging with the beauty of nature was always a sign of a “good soul” (1790/1987, p. 165). Hegel, however, considered that there was nothing in natural beauty that could not be more enriched in art; and that the highest form of truth was pure reflective thought (Rebec, 1905). And thus a painting or other work of artistic beauty could to be transcendentally higher than natural beauty, because art was created from the human mind (Hegel, ca. 1835/1993; viz. p. 4).

There is some evidence that Kant was right. Diessner et al. (2008) demonstrated that EnB correlated higher with some signs of being a good soul, such as with trait gratitude and with spiritual transcendence than did EaB. Likewise, EnB correlated lower with an indicator of not being a good soul than did EaB, that is, with trait materialism. Similar but expanded results showed the same pattern of correlations (Diessner et al., 2013). EnB correlated higher than EaB with Haidt’s care foundation; with FFM Agreeableness; with the Schwartz values of benevolence, universalism, and spirituality; with love of all humanity; with the moral good self; with moral identity; with gratitude; and with forgiveness, than did EaB.

We do not consider this definitive proof that Kant was right over Hegel. But we do consider it a strong hint pointing in that direction.

Hypothesis Five

Women May be more Appreciative of Beauty than Men

Most, and perhaps all, studies, with the EBS and EBS-R (Diessner et al., 2008; Pohling et al., 2018) have found significant or marginally significant gender differences, with small to medium effect sizes, in which women produce higher scores on EnB, EaB, and especially with EmB, than men. This finding is consistent across many disparate cultures and nations, including in samples from Russia (Sabadosh, 2016, 2017), Hong Kong (Hui & Diessner, 2016), Switzerland (Güsewell & Ruch, 2012a), Cyprus, Germany, Iran, Croatia, Samoa, and the USA

(Richel et al., 2008; Diessner et al., 2013) and India (Pohling et al., 2018). In the largest study to date with the EBS and EBS-R (internet sample of *N* = 15,129; 74.9% Americans and 25.1% from 116 other nations), women's (*N* = 7410) mean EBS total score was 75.8 (*SD* = 14.1) and men's (*N* = 8379) was 69.5 (*SD* = 15.8); *d* = .42 (Pohling et al., 2018). Likewise women's EnB scores were higher (*M* = 22.5, *SD* = 4.9) than men's (*M* = 20.5, *SD* = 5.4, *d* = .39); EaB higher (*M* = 20.1, *SD* = 5.7) than men's (*M* = 18.8, *SD* = 6.0, *d* = .22); and EmB higher (*M* = 33.3, *SD* = 7.4) than men's (*M* = 30.2, *SD* = 8.5, *d* = .39). However, EiB was essentially the same, with women's *M* = 20.0 (*SD* = 5.7) and men's *M* = 19.5 (*SD* = 5.7, *d* = .09).

One possible explanation for this consistent difference is Prum's (2017) Beauty Happens hypothesis. Prum argues that for a variety of species, but especially birds and humans, that mate choice is partially based on aesthetic decisions that go beyond natural selection, and cannot simply be explained by genetic fitness. In particular he provides a variety of arguments that human female mate choices, throughout human evolution, have been shaped by women's desire for mates with physical and moral beauty. Prum doesn't use the phrase "moral beauty," but rather he refers to the aesthetics of social personality. His list of male qualities, which women have sought in their mate choices, looks like it came straight out of Positive Psychology's list of virtues and character strengths (Peterson & Seligman, 2004): "humor, kindness, empathy, thoughtfulness, honesty, loyalty, curiosity…" (Prum, 2017, p. 242). Prum notes that infanticide by male baboons accounts for 38% of infant death, 33% of deaths of gorilla children are from alpha male infanticide, and the rate is high among chimpanzees too (but not among bonobos). However, due to the moral beauty focus of mate selection by women "human males simply *do not* murder young children for their own reproductive benefit" (p. 289), an evolutionary victory for women, children, and humanity.

Although women and men are both influenced in their mate choices by the physical beauty of potential mates, Prum (2017) emphasizes that women's stake in both their own sexual autonomy and in their desire for their children to flourish, have caused women to select men with moral beauty (aesthetics of social personality). Men with moral beauty are less likely to be violent, less likely to be sexually coercive, less likely to hurt children, and more likely to be involved in long term parenting. Compared to our primate relatives, chimpanzees and gorillas, women have been very successful by becoming highly sensitive to moral beauty in men, and selecting for those traits in their mates. This may explain why women are consistently score higher on EmB than men.

It may be that women also are somewhat more sensitive to natural beauty, because places with vistas, greenery, and water are more likely to provide for the safety and sustenance that their children need to flourish and arrive healthfully to reproductive age. Men are also concerned with their children and beautiful nature, but perhaps don't have quite as much as stake as a mother.

On the other hand, classic cross-cultural research (Buss et al., 1990) indicates that men are more concerned with women's physical attractiveness (beauty?) than women are with men's. More recent research affirms this is still the case (Bech-Sørensen, & Pollet, 2016). When considering a long term mate, woman tend to value social factors, such as status and earning potential, than men do (Buss et al., 1990) and moral factors, such as kindness and trustworthiness and child-rearing potential (Chatterjee, 2014; Prum, 2017). But women do have their physical attractiveness/beauty interests regarding men. They prefer lean men, with moderate muscle mass, broad shoulders, and V-shaped bodies (Prum, 2017). Women only prefer men with the hypermasculine features of square jaws, thick eyebrows, and prominent brows when they are ovulating; but the rest of the month they prefer somewhat feminized

features in men's faces (Chatterjee, 2014). Apparently, women want the hypermasculine man's genes for her baby, but she doesn't want him as a long-term partner (e.g., the squared off jaw is perceived as domineering – potentially too controlling of spouse and children). There has been no research on AoB and sexual selection in humans; that might be an area of fruitful future research.

It seems likely there are other reasons that women across cultures consistently appreciate natural, artistic, and moral beauty a little more than men do. This is an important focus for future research, especially by evolutionary psychologists.

Another view of women's greater AoB can be derived from Haidt's (2006) theory about social dimensions. He notes that common to social psychological research are the two dimensions of closeness and hierarchy; however, he proposes a third dimension, divinity or sacredness (which also includes morality). The anchors of the divine axis are socio-moral disgust at the bottom of the axis, and moral beauty at the top of the axis. The studies cited above indicate that women notice people at the top of the moral beauty axis generally better than men; women also more commonly experience sexual disgust than men (with large effect sizes), and more easily experience pathogenic disgust (Al-Shawaf, Lewis, & Buss, 2017). On the other hand, on our main topic, moral disgust, the research is ambiguous; some studies find no sex differences, but other studies find a small difference (Al-Shawaf et al., 2017). Based on the consistent cross-cultural finding that women show a small difference in valuing moral beauty more than men, we predict future studies will confirm a small, stable difference indicating women are more easily morally disgusted than men.

Hypothesis Six

Trait Appreciation of Beauty Leads to Human Flourishing

Appreciation of Natural Beauty Leads to Flourishing

Over the last decade, there has been an explosion of research indicating the many psychological benefits of spending time in green spaces and in wild nature. A review of such studies noted that experiences in nature cause us to flourish "by boosting our positive affect; by eliciting feelings of ecstasy, respect, and wonder; by fostering feelings of comfort and friendliness; by heightening our intrinsic aspirations and generosity; and by increasing our vitality" (Howell & Passmore, 2013, p. 242). Specifically, EnB has been associated with emotional well-being, social well-being, psychological well-being, and meaning in life in at least three cultures, Japan, Russia, and Canada (Capaldi et al., 2017).

However, just *being* in nature may not always cause some of these fine effects. It may be that only those who are *appreciating* the beauty of nature are receiving these benefits. Two studies have demonstrated that several of these positive outcomes of experiencing nature are mediated or moderated by the trait of engagement with natural beauty (EnB). One such study indicated that only those scoring high on EnB reaped the benefits of greater life satisfaction due to nature affiliation. Those scoring lower on EnB did not; this same pattern was found for the positive effects of nature affiliation on self-esteem: it was moderated by levels of EnB (Zhang, Howell, et al., 2014). The researchers summarized by stating ''connectedness with nature only predicts well-being when individuals are also emotionally attuned to nature's beauty'' (p. 55). Another such study focused on prosociality and EnB; participants who scored higher on EnB (Diessner et al., 2008) showed greater levels of prosociality as evidenced by higher scores on empathy, perspective taking, and agreeableness. Likewise, it was demonstrated that appreciating nature's beauty led participants to be more trusting and generous, as well to be more helpful to others (Zhang, Piff, et al., 2014).

On the other hand, a study which examined the effects of a two-week nature-based well-being intervention, found that trait EnB did not moderate between noticing nature and net-positive affect, nor between noticing nature and level of elevation (Passmore & Holder, 2016). Additionally, Capaldi et al.'s (2017) three nation study found that nature-identity mediated the relationship between EnB and various indices of well-being. More research to chart the influence of trait AoB, or the lack thereof, on positive outcomes of nature experiences is called for.

Appreciation of Artistic Beauty and Flourishing

The trait of engagement with artistic beauty (EaB) is highly associated with open-mindedness (Zabihian & Diessner, 2016; Diessner et al., 2013), a quality prized by scientists and integral to the scientific method (especially through seeking disconfirmation of hypotheses; Popper, 1959). Research examining the relationship between the Values in Action (VIA) Appreciation of Beauty and Excellence subscale (Peterson & Seligman, 2004) and Openness to Experience has found correlations ranging from .24 to .82 (Jónsdóttir, 2004; Littman-Ovadia, & Lavy 2012; Loske, 2006; Otake et al., 2005; West, 2006).

It has been shown that the aesthetic facet of the trait of Openness has the highest correlation to Openness of any of the Openness facets (Costa & McCrae, 1992). However, as critical as open-mindedness is to living a prejudice free life, and being open to new knowledge, there have been no studies that have examined whether a causal link exists between the trait of appreciation artistic beauty and being an open-minded truth seeker (such as a scientist). Does becoming more open-minded cause people to appreciate beautiful art more; or does an increase in the trait of appreciating artistic beauty cause people to become more open-minded? Alternatively, is there perhaps a bilateral causal process in which both constructs positively influence each other? We cannot find an empirical study that addresses this. Are people who

score high on EaB more likely to seek disconfirmation of their hypotheses in science and in a truth-seeking life? More research is needed on this important topic.

In terms of individual flourishing, having a strong trait of Openness to Experience's aesthetic facet may protect a person from dementia. In a study with a community sample of older persons it was determined that low levels of the aesthetic and value facets of Openness predicted cognitive decline, even when controlling for education, age, and the other four major personality traits. The authors concluded that seniors who are uninterested in and insensitive to beauty and art, and dogmatic in their values, were at risk for significant cognitive decline, sooner than those higher on trait Openness and the aesthetics facet (Williams, Suchy, & Kraybill, 2013).

Although not directly assessing AoB, a large study in the UK found that those who engaged with the arts were more likely to perform acts of prosociality, such as volunteering and charitable giving (Van de Vyver & Abrams, 2017a). There is a major omission in the research literature on specifically investigating the trait of EaB and various outcomes of human flourishing, such as prosociality and well-being.

Musical practice and AoB. In line with the idea that character strengths should lead to observable behavior in specific contexts, persons highly sensitive to beauty and goodness would be expected to engage in activities related to physical beauty or to nonaesthetic goodness. Empirical data support this idea within the music context. Classical and non-classical musicians showed significantly higher Openness to Experience scores than the corresponding norm populations in different studies (e.g. Dyce & O'Connor, 1994; Gillespie & Myors, 2000; Langendörfer, 2008). It has been shown that art and music students score significantly higher on engagement with artistic beauty than education and psychology majors (Diessner et al., 2008). Likewise, another study compared the character strengths profiles of orchestra musicians with

the profiles of career military officers and concluded that the former were significantly higher on appreciation of beauty and excellence than the latter (Eggimann & Schneider, 2008). Güsewell and Ruch (2012a) have shown that being in an artistic profession (e.g., musician, painter, or architect) correlated positively and significantly with appreciation of beauty and excellence and engagement with artistic beauty. It was also found that professional musicians, as a group, scored significantly higher on appreciation of beauty and excellence than non-musicians (Güsewell & Ruch, 2015).

Professional musicians thus seem to have a more pronounced sensitivity to beauty and goodness than the general population (by aesthetic sensitivity we mean, as Haidt and Keltner [2004] defined it, recognizing and taking pleasure in the goodness of the physical world). Güsewell and Ruch (2015) further examined the link between musical practice and AoB raising the question whether, on average, professional musicians would score higher on AoB than amateur musicians, and if the latter, in turn, would score higher on AoB than persons who have no musical practice. The direction of the scores on the Appreciation of Beauty and Excellence subscale (ABE) of the VIA-IS (Peterson & Seligman, 2004), confirmed this assumption; however, the difference between professionals and amateurs was not significant, in line with the idea that persons regularly involved with art - in this case, music - would display a “specific emotional responsiveness” to beauty and excellence (Haidt & Keltner, 2004, p. 539).

Musicians are far from being a homogeneous population, their personality characteristics vary according to the main instrument played (Cribb & Gregory, 1999; Kemp, 1982), the favored musical style (Gillespie & Myors, 2000; Wills, 1984), or the working context and main occupational activity (Langendörfer, 2008). This raises the question whether subgroups of professional musicians would differ with regard to different measures of the sensitivity to beauty

and goodness. Güsewell and Ruch (2013) compared soloists, orchestra musicians, and instrumental teachers on the one hand, and classical and non-classical musicians on the other hand, but could find no significant differences.

The Aesthetics facet of the Openness scale of the NEO PI-R (Costa & McCrae, 1992) is perhaps the first reliable and valid measure pointing in the direction of the personality trait of AoB. This facet appears to measure levels of sensitivity to and interest in beauty and art (of the eight questions on the Aesthetics facet, 7 ½ refer to music, dance, poetry, and art, and half a question refers to patterns in nature; no questions refer to moral beauty; Costa and McCrae, 1992), but has been criticized for being narrow, non-comprehensive, and focusing too much on traditionally high status art formsAlthough there are few studies examining AoB with this facet, one found that UK college students' aesthetics facet scores significantly correlated with liking for classical, jazz, and world music, but no correlation with liking hard rock, soft rock, electronic, soul, R & B, dance/disco, pop, techno, country/western, folk, religious, soundtrack, or rap music. However, that study's other college student sample, from Barcelona, did not show this pattern, rather, their aesthetics facet scores did not significantly correlate with any of those music genres (Rawlings, Barrantes i Vidal, and Furnham, 2000).

Comparing means allows for the establishment of significant differences between groups, but does not allow for any assertions regarding causality. Do professional and amateur musicians engage in music because of a specific sensitivity to beauty and goodness, or do they cultivate the latter through their longstanding musical practice? To address this, and similar questions, it is necessary to assess the long-term development of the sensitivity to beauty and goodness, from childhood through musical studies, and throughout life. The use of a mixed-methods research design combining psychometric methods with qualitative approaches should be considered as it would allow for a more in-depth investigation and comprehension of the artistic topics of interest.

Appreciation of Moral Beauty and the Positive Moral Emotion of Elevation

The appreciation of beauty in general seems closely related to experiencing the self-transcendent emotion of awe and related states including admiration, wonder, and moral elevation (Keltner & Haidt, 2003; Haidt & Keltner, 2004) [3]. In their awe-framework, Keltner and Haidt (2003) define two core features that determine if prototypical awe is elicited (vastness and need for accommodation) and five additional themes (threat, beauty, ability, virtue, and supernatural causality) that flavor these awe experiences and / or give rise to various awe-related states (such as moral elevation or admiration). In the context of our review, it is important to note that natural beauty as well as human-made objects and art are considered physical elicitors of prototypical awe (Keltner & Haidt, 2003; note that when beauty is coupled with awe, it is often called sublime). Impressive natural objects such as the
Grand Canyon or a tornado are vast in relation to the self (vastness) and simultaneously they have the potential to transcend the knowledge of the perceiver since mental structures likely need to be adjusted (accommodation) when one encounters such objects. Likewise, astonishing paintings and sculptures can elicit awe, as will architecture, especially if the building is on a large scale (Keltner & Haidt, 2003). On the other hand, some awe-related states are triggered by social elicitors (virtuous acts in the case of moral elevation and extraordinary non-moral skill in the case of admiration) that don't need to be vast but witnessing extraordinary virtue or skill can challenge mental structures such that it will require the need for accommodation. That is why the emotional state of elevation should not be labeled as awe although it is closely related to it

[3] For a different framework on aesthetic pleasure and its related emotions, see Schindler et al., 2017. According to their approach, not only positive, self-transcendent states but also a variety of other emotions are important in the context of aesthetic experiences including emotions of negative valence (e.g. sadness, boredom, confusion, etc.) or epistemic emotions (emotions in the context of searching for meaning or insight).

(Keltner & Haidt, 2003). However, more empirical research is needed to underpin the propositions of this fruitful framework.

In moral psychology, the term *moral beauty* has been used to refer to virtuous acts that can be emotionally experienced as something beautiful (Haidt, 2003, Diessner et al., 2008; Thomson & Siegel, 2016). An action may be cognitively denoted as something good but it only becomes an act of moral beauty once an emotional reaction is involved (Diessner et al., 2008; Güsewell & Ruch, 2012a). Although presumably only a few people would use the term moral beauty in their daily life, if one asks them to remember having witnessed impressive or moving acts of morality (or "humanity's higher of better nature," Algoe & Haidt, 2009, p. 108), they report an emotional reaction (moral elevation) which clearly can be differentiated from other emotions and which is characterized by a warm and pleasant feeling in the chest, feeling uplifted, moved, and optimistic about humanity (Algoe & Haidt, 2009; Haidt, 2003; Keltner & Haidt, 2003). Per definition, elevation is the emotional reaction to moral beauty[4], that is, outstanding or unexpected virtuous acts of others such as acts of charity, kindness, love, compassion, forgiveness, gratitude, courage, loyalty, self-sacrifice, or any other strong display of virtue (Diessner et al., 2008, Haidt, 2003, Pohling & Diessner, 2016). Motivationally and behaviorally, elevation leads to prosocial intentions and actions and to the desire to improve oneself and become a better person for the sake of others (Pohling & Diessner, 2016; Thomson & Siegel, 2017).

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[4] However, this common, wide-spread definition of the eliciting conditions of elevation carries the danger of creating a circular definition (Haidt, personal communication, June 6, 2015). As noted above, moral beauty has been conceptualized as the perception of a virtue that involves an emotional reaction within the observer, in this case elevation (Diessner et al., 2008; Güsewell & Ruch, 2012a), and elevation, in turn, is often defined as the response to moral beauty (Haidt, 2003; Thomson & Siegel, 2017). Despite this theoretical problem, in the current empirical literature there is consensus that witnessing outstanding or unexpected acts of virtuous acts has the power to elicit the moral emotion of elevation and simultaneously these acts are subjectively perceived as something beautiful. For a detailed discussion on the topic of beauty as an emotional experience, see Armstrong and Detweiler-Bedell (2008).

Thus, AoB in the moral domain can be conceptualized as the disposition to experience the state of elevation in daily life (Pohling & Diessner, 2016). Many of the studies that have investigated the appreciation of moral beauty used the EmB construct of the EBS framework (Diessner et al., 2008), and the findings from those studies converge on the view that the appreciation of moral beauty is related to higher levels of prosociality and well-being. In one study, EmB correlated positively with high levels in the care-foundation of the moral foundations, high empathic concern, high agreeableness, high levels in the dispositions of gratitude, forgiveness, connectedness to nature, and loving all humanity (Diessner et al., 2013). Furthermore the same study found that EmB was associated with prioritizing the prosocial values of benevolence, universalism, and spirituality (Diessner et al., 2013). In other studies, EmB showed positive associations with satisfaction with life, spiritual transcendence, dispositional gratitude (Diessner et al., 2008), dispositional righteous anger (anger when witnessing injustice toward others), dispositional shame, and reward responsiveness of the behavioral activation system (Van de Vyver & Abrams, 2017b), and negative correlations with materialistic values (Diessner et al., 2008). Further cross-sectional studies found that the appreciation of moral beauty correlated with higher levels of self-reported agreeableness, extraversion, openness to experience, conscientiousness, self-transcendence, satisfaction with life, hope, vitality, personal growth, and purpose in life, as well as with lower levels of neuroticism and envy (Landis et al., 2009; Martínez-Martí et al., 2016). And last, it was repeatedly found that AoB in the moral domain is associated with higher levels of self-reported altruistic behavior (Chang, Kim, & Lee, 2015; Landis et al., 2009).

AoB and Flourishing in General

Although embracing life in a positive manner is a sign of flourishing, avoiding depression and anxiety is also an important aspect of the flourishing life. A large retrospective web-based study found that the character strength of appreciation of beauty and excellence (ABE) ameliorates the negative effects of psychological disorders, increasing life satisfaction among depressed persons who score high on the subscale of ABE on the Values in Action Inventory of Strengths (VIA-IS; Peterson, Park, & Seligman, 2006)). Of the 24 character strengths measured by the VIA-IS only two had this type of influence on depression and anxiety: love of learning and ABE.

However, a direct intervention to lessen depressive symptoms, in a small study, through writing weekly beauty logs (focusing on participants' observations of natural beauty, artistic beauty, and moral beauty) did not decrease such symptoms (Diessner, Brink, & Rust, 2010). Writing those beauty logs, however, did significantly increase trait AoB a small amount. On the positive side, a recent study demonstrated a significant reduction in depressive symptoms as well as increase in happiness from a beauty-log intervention. Once a day for a week participants recorded three experiences of moral beauty, three experiences of natural/environmental beauty, and three experiences of beauty in general. Findings showed an increase in happiness for a month after pre-test, and a decrease in depressive symptoms from pre-test until a week after the intervention ended, compared to a control group (Proyer, Gander, Wellenzohn, & Ruch, 2016).

A classic concern to psychologists regarding individual flourishing is self-actualization. Researchers who studied American college students anticipated that there would be a high positive correlation between self-actualization and engagement with beauty. They reasoned that as people developed their own potential they would become more aware of beauty. Their sample's results proved them wrong: low non-significant correlations between self-actualization

and EnB, engagement with artistic beauty (EaB), and engagement with moral beauty (EmB) were found; with Engagement with Beauty Scale (EBS-R) total score just reaching significance with a low correlation (Howell et al., 2017). The authors interpreted this as a tragedy of American culture (that beauty is deemed so unimportant it was not even involved in self-actualization). Another possible interpretation would be that perhaps Maslow (1970) was correct, in the later years of his life, when he situated the aesthetics needs and self-transcendence to come *after* self-actualization in his hierarchy.

Kant (1790/1987) was adamant that one needs to be *disinterested* to appreciate beauty. In other words, the desire to possess beauty corrupts the beauty experience. Indeed, materialism is negatively correlated with AoB (Diessner et al., 2008; Howell, Pchelin, & Iyer, 2012). In Positive Psychology's search for causes of happiness there is emerging consensus that preferring experiences over possessions leads to greater happiness. For example, one study demonstrated that those who focused more on obtaining experiences than possessions had higher levels of EnB, EaB, and EmB (Howell et al., 2012).

Appreciation of Beauty and Collective Flourishing

Can beauty contribute to saving the world? Many think that the looming environmental crisis is the most serious threat to future human flourishing that humanity has ever faced (Scott, Amel, Koger, & Manning, 2016). We know that people who identify with and are connected to nature perform more proenvironmental behaviors (PEB; Mayer & Frantz, 2004; Geng, Xu, Ye, Zhou, & Zhou, 2015). And there are a variety of studies that show connectedness to nature and EnB are highly correlated (Diessner et al., 2013; Zhang, Howell et al., 2014; Zhang, Piff et al., 2014; Capaldi et al., 2017).

In two studies, one with an American community sample and the other with American college students, it was found that the personality trait of Openness to Experience was the most highly associated trait of the Big Five with proenvironmental behavior (Markowitz, Goldberg, Ashton, & Lee, 2012). In particular, it was shown that the facet of aesthetic appreciation was the major driving force behind that relationship. However, analysis of the college student sample showed that the effects of aesthetic appreciation on PEB were mediated by nature identity and valuing nature. Likewise, in one recent study, with a sample of American college students, EnB and connectedness to nature were highly correlated, but connectedness to nature mediated EnB's relationship with PEB (Diessner, Genthôs, Praest, & Pohling, 2018).

Another series of studies found that the biophilic aesthetic value was not a significant independent predictor of nature relatedness, however, it was a mediator between several other biophilic values (humanistic/emotional, symbolic/meaningfulness, moral/compassion, nature/contact) and nature-relatedness. One study in this series, using a quasi-experimental design, demonstrated a significant increase in nature-relatedness for the group that participated in the biophilic beauty activities, and no increase in the two comparison groups (Lumber, Richardson, & Sheffield, 2017).

It seems nature-identity is a more powerful predictor of PEB than traits or values (Diessner et al., in press). This is in line with the notion that the human tendency for self-consistency that is encompassed by measures of identity is a crucial if not better predictor for moral action than moral judgments alone (e.g. Shao, Aquino, & Freeman, 2008, Hardy & Carlo, 2011). This assumption has found support in a variety of empirical studies on moral identity (cf. e.g. Hertz & Krettenauer, 2016). Another issue ecopsychologists are worried about is hope. They worry that the environmental conditions are getting so bad, and the future so bleak, that people

will give up and not even try to engage in PEB. Beauty may be able to help with that as well. One small study has found trait EmB to be significantly and positively correlated with agentic hope (Diessner et al., 2006).

In summary, there are reasonable expectations that if people increase their trait level of EnB, that they will be more likely to take actions to stop the ruination of our beautiful planet. This seems rational: something you find beautiful you do not want destroyed. However, the empirical evidence for this expectation is weak – only one study has directly examined EnB and PEB (Diessner et al., in press), thus more research is needed on studying this relationship.

How Many Traits of Appreciation of Beauty are there?

How to cut the pie? The creators of the EBS and EBS-R (Diessner et al., 2008; Pohling et al., 2018) analyzed the works of philosophers and psychologists and determined there are at least four somewhat distinct forms of trait AoB and developed four subscales tapping four different traits: EnB, EaB, EmB, and EiB. Factor analytic studies have shown these to be distinct, although, correlated subscales. Cross cultural studies with the original version of the EBS (Diessner et al., 2008), with three subscales for EnB, EaB, and EmB, showed similar factor structure across such disparate cultures as Cypriot Greek, Persian, Samoan, Croatian, and German (Richel et al., 2008). The new EBS-R has shown similar factor structure across samples from America and India (Pohling et al., 2018) and Russia (Sabadosh, 2016, 2017). However, a small non-random sample of Cantonese speakers from Hong Kong did not show a four-factor structure, but rather, 51% of the variance loaded on one general beauty factor (Hui & Diessner, 2016).

Güsewell and Ruch (2012b) included the ABE subscale of the VIA-IS, the EBS, and the Appreciation of Beauty and Excellence Test (ABET) in a structural equation modeling analysis.

Their results confirmed the basic assumptions of both Haidt and Keltner (2004) and Diessner et al. (2008), namely that appreciation or engagement is a general sensitivity to beauty and goodness, which encompasses distinct, but related, dimensions. The three-dimensional model which demonstrated the best fit in their study, and which they labeled *responsiveness to the good and beautiful* (Güsewell & Ruch, 2012b), distinguished between the sensitivity for beauty in nature, the sensitivity for artistic beauty, and the sensitivity for non-aesthetic goodness.

However, it is an open question concerning how many species of AoB traits exist. As we mentioned previously, it seems likely that there may be a distinct trait of appreciating sexual or fitness beauty. We know of no scale that measures this. And perhaps there are other forms of trait appreciation of beauty that have not yet been identified and studied.

Summary

In this paper we have described various aspects of AoB, including perceptual, cognitive, emotional, trait, virtue, and valuing elements. Based on the works of a variety of major philosophers we put forth a tentative first principle of beauty, that of *unity-in-diversity*, and provided several examples of how this abstract principle can be used to understand beauty. We identified four channels of AoB: natural beauty, artistic beauty, moral beauty, and beautiful ideas. We highlighted findings from the research in neuro-aesthetics across those four channels of AoB, noting that many networks of the brain are involved in mental acts of appreciating beauty. However, the medial orbital front cortex (mOFC) is the most likely candidate for the shared processing of all forms of beauty. We explained how the trait of AoB has membership in three different families of traits: traits of love, traits of transcendence, and traits of inquiry. We briefly provided evidence that Kant may have been more correct than Hegel concerning beauty and the good soul. We examined studies indicating that women may appreciate beauty somewhat

more than men and provided an evolutionary psychology explanation for this. We noted that AoB can lead to individual and collective flourishing; appreciation of natural beauty leads to a wide variety of positive personal and social outcomes; open-mindedness accompanies engagement with artistic beauty and could make us better scientists; and appreciation of moral beauty leads to the moral emotion of elevation and prosocial action.

To Conclude

Beauty makes life worth living. As Plato has noted, beauty is the object of all love, and love makes life worth living. If we encouraged our naturally selected appreciation of natural beauty to rise into our frontal cortex, we might even stop destroying our beautiful planet and its forests and oceans. If we tapped into our trait of appreciation of artistic beauty, we might be more open-minded and thus even better scientists. As Aristotle has argued, the reason a disposition is a human virtue is because it makes a human morally beautiful. That sounds like a beautiful idea.

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