# Chapter 11
# Awe: A Self-Transcendent and Sometimes Transformative Emotion


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**Abstract** Awe is a complex emotion arising from the perception of literal or figurative vastness. Several subjective components of awe have been identified, including feelings of connectedness and self-diminishment, making it a form of self-transcendent experience. Awe has also been linked to increased well-being and altruistic behavior. This chapter describes recent advances in the experimental literature on awe, reviews some methods of inducing this emotion in the lab, and discusses some theories regarding its functions.

> In the upper reaches of pleasure and on the boundary of fear is a little studied emotion – awe.
>
> –Keltner & Haidt, 2003; p. 297

The view from the top of a mountain, staring up at the dark sky punctuated by stars, and hearing a "mind-blowing" idea clearly articulated – all of these circumstances are capable of inducing a particular emotion: awe. But what is awe? And what are its functions?

Awe's introduction into modern emotion research is largely due to a now classic article by Keltner and Haidt (2003). In this chapter, awe is described from the perspective of various fields, such as philosophy, religion, art, and psychology. Awe is defined as a complex emotion arising from a perception of vastness and a need to accommodate the perception into existing mental schemas. This vastness can come from perceptual or conceptual stimuli (Yaden, Iwry, et al., 2016). Given the paucity of psychological researchers focusing on this phenomenon in 2003, Keltner and Haidt labeled awe as a "little studied emotion" (p. 297). However, since 2003, this once esoteric emotion has captured the attention of a number of psychological researchers. A quick search in a psychology database (PsycINFO) returned 137 articles since 2003.

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H. C. Lench (ed.), *The Function of Emotions*,
https://doi.org/10.1007/978-3-319-77619-4_11

In Keltner and Haidt's (2003) article, awe is referred to as a "complex" emotion. This label is appropriate, given that several features of awe distinguish it from other emotions. Awe often contains both positive and negative valence (Gordon et al., 2017; Yaden et al., in press). For instance, awe can arise both from beautiful breathtaking panoramas (Keltner & Haidt, 2003) and from dreadful and terrifying natural phenomena, like severe thunderstorms (Piff, Dietze, Feinberg, Stancato, & Keltner, 2015; Gordon et al., 2017). Additionally, awe has several qualities that place it on the border between an emotional state and altered state of consciousness due to its capacity to alter the senses of time, space, and self. For example, the sense of self has been empirically shown to diminish and the sense of connectedness to increase during states of awe (Piff et al., 2015). This finding has led to awe being classed as a self-transcendent experience (STE), temporary mental states characterized by an increased sense of connectedness and/or diminished sense of self (Yaden, Haidt, Hood, Vago, & Newberg, 2017).

This chapter reviews research on awe conducted since Keltner and Haidt's 2003 article. It covers elicitors of awe as well as new means to induce it in the lab, the primary subjective qualities of awe, and outcomes associated with the experience of awe. This chapter concludes by discussing awe from a functionalist perspective (Lench, Bench, Darbor, & Moore, 2015), by reviewing prevailing theories of awe related to social dominance and offering a new speculative perspective that proposes that the emotion of awe may have first arisen from natural rather than social triggers.

## What Is Awe?

The perspectives proposed in the Keltner and Haidt (2003) article, introducing awe to mainstream psychological science, grew largely out of the discrete emotion tradition and other preliminary work by Ekman (1992) and Lazarus (1991). Specifically, Lazarus (1991) acknowledged the complex and multifaceted nature of awe, and Ekman identified awe as a potential basic emotion (Ekman, 1992) originating from a blend of wonder and fear. This perspective holds that basic emotions are human universals (Ekman & Cordaro, 2011).

In order to elucidate the nature of awe, Keltner and Haidt (2003) oriented their attention toward the core aspects of this emotion – focusing on "prototypical awe." The approach of analyzing a "prototype" was pioneered by Eleanor Rosch (1983). This prototypical approach draws from the literature around the philosophy of concepts (Margolis & Laurence, 1999). According to Rosch (1983), most commonly used concepts (e.g., animals, toys, means of transport) have "fuzzy" boundaries in that it is difficult to sharply delineate between related concepts using a set of necessary and sufficient conditions. Instead, definitions are organized around the clearest instance of a category, called a "prototype." According to this view, the more a given instance resembles its prototype, the more it can be considered identical to the concept. Furthermore, prototypical members share more common features with the pro-

totype than nonmembers. In terms of emotion, according to this view, emotions are not so much clearly differentiated categories but fuzzy systems in which different emotional nuances should be placed at different distances depending on their degree of similarity with the core element of the category, that is, the prototype. Fehr and Russell (1984) were among the first to propose an implementation of this "prototypical approach" to emotions. Ekman and Cordaro (2011) similarly support this perspective on emotions as categories, though with poorly defined limits, referring to "emotion families." Specifically, they posited that basic emotions should be contextualized into groups organized around a *central theme* (i.e., exclusive characteristics of a family), while specific *criteria* would define how much a member belongs to a category.

In terms of awe, Keltner and Haidt (2003) offer a prototypical analysis by defining its core features as well as contextual variations. They developed the so-called *prototypical model of awe*. They relied on the idea of awe as an emotion with fuzzy boundaries but with the stable central core of appraisal dimensions. Specifically, awe is characterized by two appraisal dimensions:

(i) *Vastness*: this appraisal dimension refers to the perception of stimuli as perceptually and/or conceptually vast. Both sweeping views and understanding a complex theory (such as theory of relativity) could be counted as potential elicitors of awe.
(ii) *Need for accommodation*: this appraisal dimension refers to altering mental frames or schemas according to new incoming information. For instance, upon understanding Einstein's theory of relativity, one must alter their understanding of both time and space. However, elements of novelty and surprise are also involved with this dimension, as it appears that not all instances of awe require alterations to existing mental schemas.

Additionally, Keltner and Haidt identified five additional emotional themes – often related to the nature of the elicitor of awe – that can "flavor" the experience of awe, giving rise to different awe-related states:

(i) Threat: a fear component can be added to awe when individuals face something perceived as potentially dangerous. This theme would seem to place awe close to the concept of the *sublime*. According to Kant (1790/1914), a key component of the sublime is facing a danger from a safe position, like safely standing on the edge of the Grand Canyon for the first time. This fearful component of awe was investigated by psychology only recently, showing that fear can indeed be a component of an experience of awe (Gordon et al., 2017).
(ii) Beauty: aesthetically appealing elicitors can introduce a variation in the core theme of awe, thus providing another theme related to this emotion. An example of an elicitor of this theme might be viewing the ceiling of the Sistine Chapel or the Pyramids of Giza. This component is considered important to the emerging field of aesthetic psychology (Konecni, 2005; Schindler et al., 2017).
(iii) Ability: when we encounter extraordinary examples of talent and ability, the emotion of awe can be accompanied by a feeling of *admiration* (Onu, Kessler,

& Smith, 2016). For instance, listening to a brilliant singer or watching an athlete play might give rise to this theme.

(iv) Virtue: this theme is related to instances of exceptional morality, turning awe into a feeling of *elevation* (Haidt, 2003). For example, reading about the lives of the saints might, for a Catholic individual, give rise to the theme of virtue from acts of charity and devotion to other people.

(v) Supernatural: this is the least clearly defined theme offered by Keltner and Haidt (2003). This appraisal theme appears in experiences that are perceived to have a religious or spiritual component (Yaden, Le Nguyen, et al., 2016).

All of these additional themes should be considered cultural variations of this emotion, arising secondarily, only after the prototypical features of awe have been established. It is unclear how consistent this part of Keltner and Haidt's (2003) theory is with mainstream emotion theory, though these themes provide interesting avenues for further empirical research.

Researchers often classify awe in several different emotion categories. For instance, awe has been conceived as belonging to the family of *positive emotions*, since it is most often experienced as positively valenced (Campos, Shiota, Keltner, Gonzaga, & Goetz, 2013; Shiota, Campos, & Keltner, 2003; Shiota, Keltner, & John, 2006; Shiota, Keltner, & Mossman, 2007). For instance, research from Sung and Yih (2015) showed the ability of awe to broaden attentive focus in a task where people were required to complete a global-local visual processing task (Kimchi & Palmer, 1982).

Awe has also been classified as a member of the *aesthetic emotion family*. Indeed, awe is considered as similar to the notion of sublime, which usually arises from somewhat threatening stimuli (Konecni, 2005). Although Shiota et al. (2007) demonstrated that only one out of three experiences of awe has any negative valence, this less common negative variant of awe deserves attention due to its different physiological and behavioral outcomes (Gordon et al., 2017).

Awe has additionally been classified as part of the *epistemological emotion* family (Keltner & Haidt, 2003). These emotions arise as responses to shifts in the comprehension of the world. For this reason, it could be labeled an "epistemic state," in that evaluations of the reality of a given perception are altered (Yaden, Le Nguyen, et al., 2016). In this regard, research from Valdesolo and Graham (2014) provided the first account for this still obscure emotional category, which has been difficult to operationalize (Chirico, Yaden, Riva, & Gaggioli, 2016). Keltner and Haidt (2003) captured one proxy of this component, that is, they found that a sense of uncertainty originates from awe-inducing stimuli.

Furthermore, recent findings confirmed awe as a member of the *prosocial emotion family* (Piff et al., 2015; Prade & Saroglou, 2016; Stellar et al., 2017). Awe often results in decreased aggressive attitudes (Yang, Yang, Bao, Liu, & Passmore, 2016) and an enhanced tendency to attend to others' welfare (Stellar et al., 2017). Recent findings demonstrated that this prosocial function was mediated by a sense of self-diminishment called "the small self" (Stellar et al., 2017). This insight led researchers to study the relationship between awe and the emotion of humility

(Kristjánsson, 2017; Stellar et al., 2017). Specifically, both awe and humility share the same propensity for altruism (Stellar et al., 2017).

In sum, awe is elicited by the need to accommodate a perception of vastness and may have certain themes associated with it, depending on the nature of the elicitor. Awe has several features that make it somewhat unusual. While most emotions are either positively or negatively valenced, and though awe is usually positive, it can contain positive and negative components (Gordon et al., 2017). Lastly, in terms of outcomes, awe has been experimentally shown to increase well-being (Rudd, Vohs, & Aaker, 2012) and enhance prosocial behavior (Piff et al., 2015). These outcomes of awe may be crucial to understanding its functions.

## What Are the Functions of Awe?

Keltner and Haidt's (2003) view draws, in part, from the functionalist paradigm, which considers emotions in terms of the role they play in facilitating adaptive behavior (Keltner & Gross, 1999; Plutchik, 1980). According to this approach, emotions are considered a result of the interaction between various psychological and physiological systems in order to facilitate a goal-directed response from the organism to a particular set of circumstances (Keltner & Gross, 1999). Construing emotions as functions allows for researchers to understand the links between their subjective components and outcomes (Lench et al., 2015; Lench, Flores, & Bench, 2011). In other words, according to this approach, emotions should be conceived as ways to adapt to survival problems. Therefore, the question posed by this perspective is: what kind of survival problem does awe address?

This chapter presents two potential answers to this question. The first is described by Keltner and Haidt (2003), who posit that awe initially helped to maintain social hierarchy by being elicited by powerful leaders. According to this view, awe arose from the social function of facilitating a subordinate-leader relationship. From the subordinate's perspective, the reaction of fear and respect combined with wonder in front of someone more powerful would strengthen and maintain social hierarchies. The negative or fearful aspects of awe are particularly relevant to this perspective, though this perspective has been somewhat neglected in the research literature (Chirico et al., 2016). Specifically, this view of awe depends on circumstances in which there is a power gradient in the group (Keltner, Gruenfeld, & Anderson, 2003). According to this view, awe acted as a primordial response to displays of power (Keltner & Haidt, 2003) by gathering people around a central dominant figure, thus reinforcing their shared social identity (Keltner & Haidt, 1999). The emotion then became generalized to any form of vastness (even nonsocial kinds), such as sweeping scenery. That is, according to their view, social triggers came before natural ones.

This chapter provides an additional view that awe was a response to nature, and only later did it become attributed to social circumstances. Natural scenery, one's immediate environmental surroundings, was, it should be noted, often a matter of

life or death in hunter-gatherer contexts. That is, finding the right place to seek shelter mattered. A theory called "prospect and refuge" (Appleton, 1996) describes the ideal kind of shelter – a location that provides both safety (at least one side protected from attack) and vantage (the ability to see approaching enemies or predators). These conditions are most often fulfilled by elevated locations with a sweeping view of the surrounding area – and this sweeping view of natural scenery happens to be the stereotypical and most prevalent elicitor of awe in contemporary settings (e.g., the Grand Canyon). This view is given some support from research in the field of aesthetics – a study that tested the prospect and refuge theory found a preference in children for sweeping scenery viewed from an elevated position (Fischer & Shrout, 2006). Furthermore, this view fits well with Kant's classic formulation of the sublime – viewing danger from safety (Kant, 1914).

Awe, then, may have been a signal that one is in a safe environment due to having both safety and a good vantage of potential dangers. Awe's association with prosocial behavior makes some sense in this view, as prosocial behavior may be nonadaptive in unsafe environments but adaptive in safe environments. Therefore, the primordial awe may have been first a response to surprisingly safe shelters that allowed for a good vantage of potential approaching enemies, thus creating an ideal context for prosocial behaviors to take place.

Supporting this view, research from the author's lab shows that physical beauty is a much more prevalent elicitor of awe, despite plenty of opportunities for the emotion to arise from dominant others (e.g., bosses; Yaden et al., in press). The social-first view would have to explain how awe initially served a function related to social hierarchy but is now most often triggered by natural beauty. The nature-first view, on the other hand, would predict that the initial elicitors of awe remain the most prevalent, which is the case.

Furthermore, in hunter-gatherer contexts, groups were small enough that most individuals would know one another and would see one another frequently. This fact would make it difficult for the novelty component of awe to arise. Additionally, awe may be unnecessary to maintain social hierarchies as aggression and submission are already deeply ingrained social responses apparent in other mammalian contexts (Sidanius & Pratto, 2001), in species such as rodents, which seem to lack the emotion of awe. A proto version of awe has been arguably observed in primates, however, in response to waterfalls, gusts of wind, and thunder (Goodall, 2005).

Social triggers also elicit awe in humans, but this seems to occur most often in cases where one does not know the individual who is the object of awe. Being "starstruck" by a famous or powerful person is a contemporary example. It may be the case that awe only later came to be elicited by social stimuli when human groups grew large enough that impressive leaders were less known and more imposing due to their unfamiliarity. It might be that when leaders came to be seen as "forces of nature," as it were, or in cases in which individuals were able to project an exaggerated impression of power, that social circumstances induced intense experiences of awe.

However, the social-first view emphasizes the role that awe may play in learning. According to this view, awe facilitates faster learning due to the social hierarchy that

it maintains. The nature-first view does not address this aspect, nor does it make sense of the need for accommodation appraisal dimension. Further analyses on the functions of awe are needed.

## The Self-Transcendent and Transformative Aspects of Awe

Regardless of the true *primum movens* of awe, this emotion has important social consequences. In particular, awe has a self-transcendent quality in that it decreases self-salience and increases feelings of connectedness to other people and has been empirically demonstrated to cause increased prosocial behavior (Piff et al., 2015).

More specifically, awe was classed as a "variety of self-transcendent experience" (Yaden, Haidt, et al., 2017), which also includes the constructs of flow (Chirico, Serino, Cipresso, Gaggioli, & Riva, 2015; Csíkszentmihályi, 1990), mindfulness (Kabat-Zinn, 2003), other self-transcendent positive emotions (Van Cappellen, Saroglou, Iweins, Piovesana, & Fredrickson 2013), peak experiences (Maslow & Pi, 1964), and mystical experiences (Hood, 1975; Yaden et al., 2015). Each of these mental states shares a self-transcendent quality (though they are quite different in many other ways), and each of them is associated with well-being (Yaden, Haidt, et al., 2017).

The self-transcendent quality may exist on a spectrum of intensity, referred to as the *unitary continuum* (Yaden, Haidt, et al., 2017). Mystical experiences are at the far end of this spectrum, as these experiences can include feelings of complete oneness with other people and environment. Empirical research on mystical experiences elicited by psychedelic substances, for example, has shown that these experiences are associated with increased well-being that can last for over a year (Griffiths Richards, Johnson, McCann, & Jesse, 2008; Griffiths, Richards, McCann, & Jesse, 2006; Yaden, Le Nguyen, et al., 2017). Furthermore, mystical experiences are sometimes rated among life's most meaningful moments. In the Griffiths et al. (2006) study, two-thirds of the sample rated their experience in the top five most meaningful moments of their life. This raises the possibility that sufficiently intense awe experiences also may result in lasting enhancements to well-being and, in some cases, could even be counted as transformative.

While it is less clear why this would be the case from a functionalist perspective, awe appears capable of being transformative. Transformative changes are deep, radical, and enduring changes (Gaggioli, 2016). In other words, after such an experience, one is never quite the same – or one at least evaluates oneself as forever changed. These experiences affect the way people perceive themselves and the surrounding world, thus acting as potential drivers of a personal transformative change (Gaggioli, 2016; Gaggioli, Chirico, Triberti, & Riva, 2016). The conversion of Saint Paul on the road to Damascus – when Paul, a Christian persecutor, fell down from his horse while hearing the voice of God on him and saw a blinding light – is a paradigmatic case of transformation. A number of researchers have discussed transformative experiences; Schneider dedicated his work to present six stories on personal

change (Schneider, 2009). Pearsall (2007) devoted a book to describe his personal experience of transformation occurring after the death of his son. Regarding the transformative nature of awe, Pearsall stated:

> True awe raises more questions than it does answers and challenges faith more than confirms it... Awe is when life grants us the chance to think differently and deeper about itself, so that we are not left squandering its gift by languishing it away. Being in awe can make a real mess of our lives by disrupting our certainty about ourselves and the world, but it also enlivens and invigorates our living and can change how we decide to live. (p. xviii).

Maslow also identified awe as a core moment in the process of change or as the spark to initiate transformation (Chirico et al., 2016; Maslow, 1962). These cases may occur when intense feelings of awe result in a need to accommodate many of one's mental structures or schemas. It may be that under certain circumstances the need for accommodation results in changes to one's sense of self. In other words, the need for accommodation might make the experience of awe extremely pertinent to an individual to the extent that it can affect her or his identity. Therefore, awe's transformative function can, perhaps, trigger a restructuring of individuals' inner world at the most intimate level.

## Eliciting Intense Awe Experiences in Experimental Settings

Despite the potential to study self-transcendence and even personal transformations resulting from awe, researchers usually focus on instances of awe that are somewhat more subtle in order to fit the constraints of an experimental setting (Chirico et al., 2016). Silvia, Fayn, Nusbaum, and Beaty (2015) highlighted the difficulty of inducing high-intensity experiences of awe in the lab. Silvia et al. (2015) described the gap between awe captured in qualitative reports and the operationalization of awe in controlled settings. Moreover, they suggested a possible solution to this issue, calling for researchers to look for "Other methods and traditions to place the findings from low-intensity and small-scale lab research in context (Silvia et al., 2015, p. 382).

There are a few popular methods for inducing awe in experimental settings. The first is watching videos that induce awe (e.g., Piff et al., 2015). The next, somewhat less effective method, is to use awe-inspiring images (e.g., Shiota, Neufeld, Yeung, Moser, & Perea, 2011). Other labs have asked participants to recall and write about awe experiences (e.g., Griskevicius, Shiota, & Neufeld, 2010). Keltner's lab has had some success with bringing participants to scenic settings to look at California Oaks (Piff et al., 2015) or to a museum to see dinosaur bones on display (Shiota et al., 2007).

The authors' research groups responded to the call by Silvia et al. (2015) to look beyond conventional methods to induce awe, in order to create a more intense version of it in lab settings. After analyzing the issue, the lab rephrased the issue posed by Silvia. In methodological terms, their call can be viewed as attaining ecological

validity. Therefore, attention was oriented toward innovative methods able to ensure a high degree of ecological validity despite the complexity of the target experience of awe. A search of the available emotion-induction methods showed virtual reality (VR) as a new method that is effectively able to induce the multifaceted and intense emotional experience of awe even in highly controlled laboratory settings (Parsons, 2015).

VR is a simulative technology able to generate the feeling of being present within a virtual environment, as if it were real. Specifically, users can have a certain degree of control in the virtual environment by navigating inside it, exploring it, manipulating virtual objects, or interacting with virtual agents (Triberti & Chirico, 2016; Parsons, 2015; North & North, 2016; Riva, 2005; Riva et al., 2016). VR technology makes this possible by integrating different tools such as head tracking, controllers (e.g., joystick), different types of displays (2D, 360° field of view), and stimulations (i.e., visual, auditory, haptic). These features allow VR to reproduce complex instances of emotional experiences while preserving a high degree of experimental control. Moreover, it is possible to change specific aspects of a scenario, analyzing the subsequent impact on users' experience.

Besides these technical aspects, VR can provide additional assets for the study of emotions more generally. VR can enhance the intensity of emotional states through a peculiar experience called "presence," i.e., the sense of "being there" in a virtual or real environment along with the ability to pursue personal intentions within it (Riva & Waterworth, 2003, 2014; Waterworth, Waterworth, Mantovani, & Riva, 2010; Waterworth, Waterworth, Riva, & Mantovani, 2015). Moreover, through VR, it is possible to recreate almost any kind of experience, including those violating laws of physics (e.g., Ritter et al., 2012) and emotionally complex ones (e.g., Chirico, Ferrise, Cordella, & Gaggioli, 2018).

Recent perspectives on the design of emotional experiences (Triberti, Chirico, La Rocca, & Riva, 2017) proposed appraisal themes of complex emotions as design guidelines for the development of both virtual and real environments. A basic implementation of this approach in the field of awe was provided by Chirico et al. (2017), in which the vastness appraisal dimension of awe was manipulated by changing users' field of view in a virtual environment. Users had the possibility to explore a static awe-inspiring (i.e., a view of tall trees) or neutral environment (i.e., hens wandering) either on a 2D or 360° format. In other words, participants could observe emotional scenarios as if they were in a normal cinema with a 2D monitor (i.e., watching tall trees from a distance) or as if they were truly "in" the scene (i.e., in a forest surrounded by tall trees). In this case, the dimension of presence (i.e., "the physical extent of the sensorial information"; Coelho, Tichon, Hine, Wallis, & Riva, 2006, p. 29) was manipulated by means of changing the technological features of the medium. Self-report assessments and psychophysiological measures of awe showed that induced awe was more intense when elicited by 360° virtual scenarios. This approach supports the need to "design" experiences of awe in the lab to simulate natural experiences and suggests that VR is a promising tool to pursue this goal.

## Conclusion

Since Keltner and Haidt's (2003) article introducing awe to mainstream emotion research, the emotion of awe has received empirical attention elaborating its triggers, subjective qualities, and outcomes. Awe has been shown to be complex, both in terms of its mix of positive and negative valence and its capacity to alter the senses of time, space, and self. The functions of awe are still unclear but may be most related to its capacity to enhance social connectedness. The theoretical debate of whether awe's function first arose out of social hierarchy dynamics and was later elicited by natural scenery, or whether it was initially a signal of an environment offering safety and a sweeping vantage (i.e., prospect and refuge) and was later triggered by impressive leaders, is worthy of further discussion from the functionalist perspective. Moreover, the self-transcendent and transformational aspects of this emotion deserve more empirical attention. Lastly, new means to elicit awe are becoming available, such as VR. Going forward, more ecologically valid studies will provide answers to the many open questions still surrounding the emotion of awe.

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