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AWE AND POSITIVE AFFECT: THE ROLE OF SELF-TRANSCENDENCE AND SELF-  
FOCUSED ATTENTION

AUTUMN M. CHALL

50 Pages

The present study discussed the mechanism behind awe's ability to improve affect. Proposed mechanisms include a lowered level of self-focused attention and a heightened level of self-transcendence since awe experiences have been found to decrease self-interest and significance (Bai et al., 2017; T. Jiang & Sedikides, 2021). To examine self-focused attention and self-transcendence as potential mediators for the relationship between awe and positive affect, this study utilized therapeutic writing techniques. In a between-subjects design, participants were randomly assigned to write about either a personal experience of awe or a neutral experience. Following this, participants filled out questionnaires assessing affect, level of awe induced, self-focused attention, and self-transcendence. Ultimately, 431 participants (college student from the Department of Psychology) of at least 18 years old were included. Half of the proposed mediation model was supported—only the path from condition to self-transcendent experience to positive affect was significant. This provides support for self-transcendence as a mechanism by which awe improves affect. Additionally, the awe recall writing intervention did relate to significantly greater feelings of awe than the neutral writing intervention, indicating that writing about awe may be an effective method of inducing it. This study addressed the mechanism by which awe has therapeutic effects in an effort to (a) increase knowledge of awe in general, (b) increase knowledge of what makes certain experiential alternatives to talk therapy

effective, and (c) assess the effectiveness of writing about awe experiences as a more direct method of accessing the benefits of awe.

**KEYWORDS:** Awe; self-focused attention; self-transcendence; positive affect; well-being.

AWE AND POSITIVE AFFECT: THE ROLE OF SELF-TRANSCENDENCE AND SELF-  
FOCUSED ATTENTION

AUTUMN M. CHALL

A Thesis Submitted in Partial  
Fulfillment of the Requirements  
for the Degree of

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2023

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AWE AND POSITIVE AFFECT: THE ROLE OF SELF-TRANSCENDENCE AND SELF-  
FOCUSED ATTENTION

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A.M.C.

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## CHAPTER I: INTRODUCTION

In the woods, we return to reason and faith. There I feel that nothing can befall me in life—no disgrace, no calamity (leaving me my eyes), which nature cannot repair.

Standing on the bare ground, —my head bathed by the blithe air and uplifted into infinite space, —all mean egotism vanishes. I become a transparent eyeball; I am nothing . . .

(Emerson, 1979, p. 39)

The fields of clinical and counseling psychology are interested in alleviating human suffering and maximizing prosperity (Leahy et al., 2009). From the beginning (e.g., Freud, Jung, and philosophers before), it has been clear that there are a variety of ways to go about reaching these goals. Talk therapy has proven effective in a variety of contexts. This is particularly true if one makes use of the mechanism by which it works: a set of common factors that each type of talk therapy has in common, such as unconditional positive regard and empathy (Corey, 2017). Still, talk therapy may not be the most effective option for everyone. For some, it simply does not work. For others, it works, but there may be options that would have greater efficacy. This is where alternative, experiential forms of therapy enter the picture, such as art, music, nature-based, and psychedelic therapy. The literature shows that these forms of therapy can be equally as effective as traditional therapies in helping with issues such as depression, anxiety, bipolar disorders, and so on (Hendricks, 2018; Noorani et al., 2018; Schertz & Berman, 2019). For nature-based and psychedelic therapies in particular, there is a growing body of research supporting them as effective alternatives to talk therapy in improving disorders, such as PTSD and depression (Annerstedt & Währborg, 2011; Luoma et al., 2020). Although the mechanisms by which these therapies have their effects is not yet certain, one of the commonly proposed ways in which these therapies differ from traditional methods is their consistent induction of awe

and ability to provide shifts in perspective through experience (Anderson et al., 2018; Hendricks, 2018).

Connection to nature is referred to as a fundamental need by many (Schertz & Berman, 2019). As humans become increasingly distant from their connection to nature, the need for nature-based therapies becomes clear. It is well-established that awe is a common response for individuals encountering beautiful natural environments and, furthermore, there is evidence that awe leads to greater feelings of connection to nature (Moreton et al., 2019). It has been shown that experiencing awe can lead to a variety of positive outcomes, and awe is theorized to be part of the reason why natural environments have the therapeutic effects that they do (Anderson et al., 2018). Still, the mechanism by which awe can have therapeutic, healing, and positive impacts remains uncertain.

Similarly, psychedelic-assisted therapy is known to be capable of inducing a variety of positive, enduring psychological and behavioral changes, though the mechanism through which this occurs is still being explored (Luoma et al., 2020). Hendricks (2018) argues that a potential model for this effect is such that the administration of psychedelics leads to awe, which leads to small self/ego dissolution, and in turn, to self-transcendence and higher long-term positive affect, among other things. In this model, Hendricks names awe as an essential mediator for the relationship between psychedelic-administration and its long-term effects, with small self/ego dissolution as an important step in the model as well.

The general purpose of this study is to investigate how awe might lead to improved affect. I address the mechanism by which awe has therapeutic effects in an effort to (a) increase knowledge of awe in general, (b) increase knowledge of what makes certain experiential

alternatives to talk therapy effective, and (c) assess the effectiveness of writing about awe experiences as a more direct method of accessing the benefits of awe.

## CHAPTER II: REVIEW OF THE LITERATURE

### **Awe**

Holding a newborn baby, reaching the top of a mountain, and looking up at the sky on a beautiful day all have something in common: they can induce the experience of awe or being moved. Such experience provides a zest or amazement that can keep one interested in and in love with the world and life. Many of life's defining moments induce *awe*. Although it has proven a challenge to concisely define awe with its diverse elicitors and expressions, the most widely accepted definition of awe is an emotion or experience that occurs when one encounters a stimulus that is so vast (in size, social status, scope, or complexity) that current knowledge cannot easily assimilate to it, an experience that then alters one's understanding of the world. The beauty of nature is commonly known to be an elicitor, but the strongest elicitors of awe seem to be in response to others (Bai et al., 2017).

In the research literature, there seem to be two overall forms of awe identified, with various subcategories and research methods under each. The first is experiential, or state, awe. This is the awe one might experience as a fleeting emotional experience, similar to momentary happiness or state anxiety. The other form is dispositional, or trait, awe, which is a longer-burning disposition/approach to life.

#### **Experiential Awe (State Awe)**

Experiential/state awe is a transient feeling or emotion. Emotions “involve loosely coupled changes in the domains of subjective experience, behavior, and peripheral physiology” that unfold over a period of seconds to minutes and may be harmful or helpful (Gross, 2015, p. 3). As such, experiential awe is a “quick boil” type of awe that comes and goes relatively quickly (Schneider, 2017). It encompasses a change in subjective experience, behavior (i.e., facial

expression and posture), and physiological response that is passing and short-lived in the way of all emotions. Such experiences of transient awe are consistent across cultures and can be considered a universal human experience (McCrae, 2007).

The subjective emotional experience is that of vastness (expanding some aspect of one's usual frame of reference), leading to a need for accommodation (Keltner & Haidt, 2003). It is also externally focused, rather than self-enhancing, resulting in an emphasis on greatness and connection outside of the self (Jiang & Sedikides, 2021). Unlike many other emotions, there is some debate about whether there is an explicit facial expression or behavior tied to awe. According to Alexander (2016), it can resemble surprise in some people but comprise a far-off gaze in others. On the other hand, Stellar et al. (2017) indicate that awe does have universally recognized expressions in both the face (Campos et al., 2013; Shiota et al., 2003) and voice (Cordaro et al., 2016; Simon-Thomas et al., 2009). In addition, a physical feeling is elicited that can include both "chills" and "thrills," a gentle rush through the body, complete with warmth in the chest, tears in the eyes, tingling, and goosebumps due to a response in the sympathetic autonomic nervous system (Maruskin et al., 2012; McCrae, 2007).

Such emotion can be induced by an aesthetically beautiful sight, poem, song, work of visual art, intellectual epiphany, and the like. It can occur in response to a stimulus one is commonly exposed to that is viewed differently or to a new stimulus; however, in either case, it tends to occur in response to information-rich stimuli (i.e., something that is difficult to accommodate to) (Alexander, 2013; Shiota et al., 2007).

### ***Cultural Conceptualizations of Experiential Awe***

State awe is recognized as a cultural universal. For example, *kama muta* is a Sanskrit term meaning "to be moved." This is a feeling of oneness, love, belonging, or union with an



individual, a nation, nature, etc. Much like awe, it is characterized by chills, goosebumps, tears in the eyes, or warmth in the center of the chest (Seibt et al., 2018; Zickfeld et al., 2019). Like awe, it fosters openness, a reevaluation of priorities, and a focus outside the self. Physically, the experiences of awe and kama muta are the same; outcomes are similar as well. Kama muta seems to be a narrow category underneath the larger umbrella of experiential awe that related to feelings of love, greater purpose, or connectedness. For example, Seibt et al. (2018) showed the same heartwarming videos to individuals from the United States, Norway, China, Israel, and Portugal. In doing so, they found that, regardless of culture, individuals indicated being significantly positively moved, with additional shared indicators such as tears, goosebumps, warmth in the chest, and positive emotion.

Kama muta is not the only other cultural conceptualization of awe. For example, awe is mentioned in the Christian bible, which emphasizes wonder and how it leads to connection (American Bible Society, 2010). According to Halstead and Halstead (2004), Hebrew and Greek languages bring a reverence to the concept by using the same word for both *awe* and *fear*. In their 2017 study, Bai et al. found that different stimuli are more likely to elicit awe depending on one's culture. For example, a Chinese sample rarely experienced awe in response to self-relevant experiences, whereas an American sample frequently did. Razavi et al. (2016) examined awe using the Dispositional Awe Scale in four countries which have great variation in their cultural values: the United States, Iran, Malaysia, and Poland. They found mean scores on the scales for awe, amusement, and pride to be invariant across these countries. There was, however, a significant difference in mean scores on disposition toward awe between countries, particularly the U.S. (highest) and Iran (lowest) (Razavi et al., 2016).

### *Awe as an Experience*

Some research has considered awe to be less of an emotion, as indicated above, and more of an experience. Many of these researchers categorize awe as a self-transcendent experience because there it reaches beyond emotion, putting it into the same category as flow, peak, moral elevation, and mystical experiences (Chirico & Gaggioli, 2018). Self-transcendent experiences (STEs), are transient mental states with a decreased salience of the self and an increased feeling of connectedness. These may be experienced through something as simple as the loss of oneself in a book or something as intense as the feeling of being connected to all beings (Chirico & Yaden, 2018). According to Van Cappellen and Saroglou (2012), awe being self-transcendent may be key to what distinguishes it from other positive emotions, such as joy. Yaden et al. (2017) provide three accounts: a Christian experiencing God's presence, a Buddhist reaching enlightenment, and a neuroscientist having a stroke, each of whom describe an experience of transcending the self. Their sense of being a bounded, separate self is absent. The neuroscientist explained, for example, “. . . I could no longer clearly discern the physical boundaries of where I began and where I ended. I sensed the composition of my being as that of a fluid rather than that of a solid. I no longer perceived myself as a whole object separate from everything” (Taylor, 2009, p. 42). Although not always as intense as the previous example, one-third of individuals claim to have had these self-transcendent experiences (Hood et al., 2009).

The various types of STEs have many commonalities. For example, moral elevation is a STE that results from an appraisal of moral excellence that induces feelings of greater connectedness to others and nature. Like awe and kama muta, moral elevation invokes feelings of being touched, moved, or inspired; it requires the need for accommodation, and can be felt as physical warmth in the chest (Moreton et al., 2019).

According to Griffiths et al. (2006), psychedelics, such as LSD and psilocybin, are capable of enabling individuals to experience awe and other life-changing, mystical experiences, which occur spontaneously. At a 2-month follow up, individuals who had been administered psilocybin indicated higher positive affect, lifetime spiritual mysticism, and self-transcendence ratings. More recently, Hendricks (2018) theorized that psychedelics are the strongest elicitors of awe, being central to the mystical experiences one has when taking psychedelics.

### **Dispositional Awe (Trait Awe)**

Dispositional/trait awe is contrasted with state awe in that it is awe as a trait or approach to life rather than a fleeting emotion or experience. This form of awe is more an aspect of one's personality. Schneider (2017) has called it a "slow simmer" type of awe which encompasses a general excitement for participation in life by addressing the entirety of it (pleasant and unpleasant) with reverence, fellowship, and attention. In this sense, awe can be viewed simultaneously as necessary for, and a by-product of, a life deeply lived. Such a perspective is in line with the eudaimonic view of well-being, which emphasizes meaning and self-realization as key to an individual fully functioning. Following this view, trait awe is something that one is more likely to have if they are self-determined, or living as the truest, most genuine version of themselves (Ryan & Deci, 2001).

Part of this approach to life is encompassed in the dispositional awe research. Research has found that there are certain personality traits that serve as predictors for experiencing awe more frequently. People who have higher levels of extraversion and openness to experience tend to have higher levels of awe at a dispositional level as measured by the Dispositional Awe subscale of the Dispositional Positive Emotions Scale; these people are, therefore, more likely to experience awe (Shiota et al., 2006). Dong and Ni (2020) found that dispositional awe is a

mediator between openness to experience, extraversion, and subjective well-being in Chinese college students. There also seem to be physical differences in the brains of individuals who have higher scores on dispositional awe (Guan et al., 2018). Guan et al. (2018) found that a greater level of dispositional awe is negatively associated with regional gray matter volume in the anterior cingulate cortex, middle/posterior cingulate cortex, and middle temporal gyrus, meaning that awe may relate to attention, conscious self-regulation, and cognitive control.

### **Correlates of Awe**

The experiencing of awe has been found to correlate with a variety of positively and negatively valenced outcomes. In general, awe has a powerful ability to broaden thought and open one to a wider scope of possibility (Dong & Ni, 2020). For example, Dong and Ni (2020) found that those with higher levels of awe are more likely to also have high levels of extraversion, openness, and subjective well-being. Williams et al. (2022) have also found awe to be associated with agreeableness. Other research has suggested that openness to awe-inducing experiences is an expansive trait, leading to other positive emotions like compassion and joy (Alexander, 2016). This is consistent with the Broaden and Build Theory, which states that positive emotions broaden awareness and encourage exploration, opening one up to a greater repertoire of behaviors over time (Fredrickson, 2001).

Williams et al. (2022) also found awe to be related to aesthetic engagement (degree to which individuals engage with art, nature, and beauty) and proneness to aesthetic chill (shiver/goosebump in response to aesthetic stimuli). Proneness to experience awe and proneness to aesthetic chill have similar outcomes for affect. Similar to awe, being prone to aesthetic chill is not domain specific such that those open to aesthetic chill in one domain (e.g., nature) are also open to it in another (e.g., altruism). The study further examined individual differences in awe

responses to an aesthetic film clip as compared to a different emotion-inducing film clip.

Aesthetic engagement and proneness to aesthetic chill were related to higher awe ratings greater reported chills/goosebumps in response to the film clip. They were also more related to dispositional awe.

Additionally, awe is associated with positive emotions. Nelson-Coffey et al. (2019) examined the variety of emotions that a prototypical awe experience (video of Earth with commentary) can induce and found that, along with awe, participants reported significant levels of compassion, gratitude, love, optimism, humility, and connectedness. Research has also discussed awe as correlating with prosocial behaviors, including altruism and patience (Schneider, 2017). Studies are beginning to find awe to be related to increased reports of nature connectedness and meaning in life (Alexander, 2016; Moreton et al., 2019). Awe appears to heighten perception and improve focus on the present moment (Bonner & Friedman, 2011). Stellar et al. (2015) found awe to be one of the positive emotions that predicts lower levels of inflammatory cytokines, one marker of low inflammation.

Further, awe has even been shown to be capable of restructuring mental schemas and worldviews to such a great extent that it can help those struggling with their mental health. Studies examining the extent to which laboratory-induced awe can alleviate depressive symptoms have been particularly promising in indicating that awe can be helpful (Chirico & Gaggioli, 2021). Specifically, Chirico and Gaggioli (2021) state that the transformative potential of awe to reconstruct preconceived notions and expectations can work against the fixed negativity that can occur in many mental disorders (e.g., MDD). For example, Tarani (2017) found that awe-inducing videos decreased participants' brooding rumination (negative self-reflection) and level of hopelessness as compared to amusement-inducing videos. Additionally,

the Default Mode Network (DMN), a brain network with activity related to self-processing, mind-wandering, and goal-oriented activities, has been found to be more active in those with MDD (Arnone, 2019; Coutinho et al., 2016). In individuals who experience awe, whether as a result of a video, psychedelics, etc., DMN activity tends to decrease, another implication for awe's ability to improve symptoms (Hendricks, 2018; van Elk et al., 2019).

On a societal level, Keltner and Haidt (2003) theorize that awe is linked to political change and religious transformation. Given what we know about the general stability of personality and values, it could make sense for awe to be a powerful method for quick change and growth (Keltner & Haidt, 2003). This is one of the reasons for the long-standing interest in awe from sociological, philosophical, and religious perspectives. For example, Van Cappellen and Saroglou (2012) successfully induced awe in one experiment by asking participants to write about an awe-inducing experience and in another by showing participants videos of panoramic views or childbirth. They found that awe increased participants' spiritual-related feelings and behavioral intentions, as measured by their willingness to visit spiritual versus hedonistic travel destinations and their feelings of self-other overlap with friends/humanity, whereas pride and amusement did not increase.

Awe can also bring a sort of thrill and dread; as Schneider (2017) points out, it is a comingling of "thrill and anxiety" and "humility and wonder of living" (p. 3). As mentioned in the definition, awe is something that is difficult to accommodate to, likely requiring personal changes. It may be that some experiences are too great for categorizing or labeling, which can lead to feelings of discomfort. People may live a long time without integrating an awe-inducing experience into their lives because they simply are not sure how to do so.

The section above demonstrates the impact awe can have on people both mentally and physically in the short-term as well as the long-term. The mechanism through which these correlates of awe come to be is less certain, though there are many theories. One of the proposed reasons for these outcomes may be that individuals are taken out of themselves when they experience awe; they are less focused on their self, they feel small, and their sense of self is diminished.

### **Focus on the Self**

In the midst and aftermath of awe, one's interest in the self can seem inconsequential, with identity receding into the background of awareness (Bai et al., 2017). Awe directs one's focus onto their large-scale surroundings, diminishing the perceived significance of the self (Jiang & Sedikides, 2021). For example, one study found that awe experienced through exposure to nature scenes led participants to report that they felt a small self and were in the presence of something greater (Piff et al., 2015a). Yaden et al. (2016) described a similar experience occurring in astronauts when they view the Earth from space. Interestingly, a photo of this view did not provide similar results in a study by Chirico and Gaggioli (2018), indicating that the realness of the experience may be part of its impact. This self-smallness has been consistently shown to result from feelings of awe but not other positive emotions (Jiang & Sedikides, 2021; Piff et al., 2015; Shiota et al., 2007). For example, religious epiphany, being in nature, and encounters with morally exemplary people evoke this sense of reduced significance of the self (Keltner & Haidt, 2003). This self-smallness as a function of awe has been observed in individuals from both collectivistic and individualistic cultural backgrounds (Jiang & Sedikides, 2021).

This lessened focus on the self relates to a variety of constructs that share a similar idea. In the literature, the lessened focus on the self is most commonly referred to as lowered self-focused attention, numinous experience, flow, small self, and self-transcendent experience.

### **Self-Focused Attention**

Self-focused attention can be defined as “an awareness of self-referent, internally generated information that stands in contrast to an awareness of externally generated information derived through sensory receptors” (Ingram, 1990, p. 156). In the literature, it is generally agreed upon that there are two types of rumination or self-focused attention (SFA): brooding (a repetitive, passive focus on one’s emotions) and reflective pondering (a cognitive contemplation of one’s problems) (Treyner et al., 2003). In an issue of semantics, Trapnell and Campbell (1999) refer to self-focused attention as involving rumination and reflection, using the same definitions as above for each. This distinction between the two types of SFA is necessary because there is a paradox indicating that sometimes self-focused attention is positively related to well-being, and other times, it is negatively related to well-being. The idea is that these two types of SFA have different motives and outcomes. According to Newman and Nezlek (2019), *brooding* (referred to by them as *rumination*) is the neurotic or anxious self-attentiveness related to neuroticism, negative affect, and depression. *Reflection* is an intellectual or rational self-attentiveness related to openness and need for cognition/self-knowledge. Reflection can also be called self-observation (Newman & Nezlek, 2019).

### **Numinous Experience**

Numinous experiences are states of astonishment in the face of unknown power. Lönneker and Maercker (2021) attempted to define and clarify this type of experience which has, according to some, proven impossible to define in rational terms. Prior to their efforts,



definitions of this construct were vague and varied. The phenomenological definition they formed consists of three components: “the sense of facing a *wholly other* or alien reality, the feeling of personal insignificance and disconnectedness, and the ‘contrast-harmony’ of *tremendum* and *fascinans*” (Lönneker & Maercker, 2021, p. 401).

## **Flow**

Flow is a state being fully involved in a task that is perceived as engaging (Chirico & Gaggioli, 2018). It is composed of nine dimensions: challenge-skills balance, action-awareness merging, clear goals, unambiguous feedback, concentration on the task at hand, sense of control, loss of self-consciousness, transformation of time, and autotelic experience (Seligman & Csikszentmihalyi, 2000). Like awe, flow has been defined as a self-transcendent experience, though a model by Yaden et al. (2017) indicates that awe is a more intense and rare form of STE than flow. Chirico and Gaggioli (2018) used awe-inducing virtual reality environments to assess the correlation between self-reported awe and flow. They found that the two had high correlations with the main self-transcendent dimensions of flow. That is, the merging between action and awareness, the perception of losing the sense of time, the loss of self-consciousness, and the feeling of living an autotelic dimension of experience.

## **Small Self**

Awe-inducing experiences tend to call to mind how small one is in the grand scheme of things. The *small self* is a diminishment in the sense of self and its significance (Tyson et al., 2021). According to Tyson et al. (2021), small self encompasses three dimensions: the experience of a smallness of self-size, the feeling that there is a presence of something bigger than oneself (vastness relative to the self), and the feeling that one’s day-to-day problems are trivial in the big picture (self-perspective). For example, Piff et al. (2015) found that awe

experienced through exposure to nature scenes led participants to report that they felt a small self and were in the presence of something greater.

### **Self-Transcendent Experience**

Self-transcendent experiences are “temporary feelings of unity characterized by reduced self-salience and increased feelings of connection” (Yaden et al., 2017, p. 1). Such experiences can be described as *mystical*. Historically, these experiences have been associated with prayer, meditation, and the use of psychedelic drugs (Griffiths et al., 2006). Yaden et al. (2016) describe the experience that astronauts have when viewing the Earth from space as a state of awe with self-transcendent qualities. Research in neuroscience has confirmed certain patterns of brain activity that may be associated with feelings of unity with other people, existence, and the divine. For example, when one experiences those feelings, activity is temporarily reduced in the posterior superior and inferior parietal lobes, areas associated with spatial awareness. It is possible that this contributes to the reduced awareness of one’s physical self that is known to occur with such experiences (Newberg et al., 2001; Urgesi et al., 2010).

### **Correlates of Lowered Self-Focus**

It may be the case that many of the positive correlates of awe stated above are due to the perception of small self and lower self-focused attention. For example, lowered self-focused attention in the form of decreased rumination is related to positive mental health outcomes. Though the ability to think about oneself is a unique and adaptive ability, an excess of self-focus can contribute to mental health concerns; high levels of self-focused attention are related to chronic negative affect (Brockmeyer et al., 2015). The less adaptive form of SFA, rumination, predicts the onset of and greater future levels of depression (Aldao et al., 2010). It is also related to anxiety and eating disorders (Zucker et al., 2015). Several studies have shown that SFA is

higher following negative, but not positive events, as is negative affect (Mor & Winquist, 2002; Sedikides, 1992). Lowered self-focus and smallness of self are also related to prosocial behavior as they can promote the assumption of collective identity and collaboration (Piff et al., 2015a). Neff (2003) argues that a de-emphasizing of the self is a prerequisite for self-compassion, such that “healthy and constructive self-attitudes stem in part from de-emphasizing the separate self, rather than merely building up and solidifying one’s separate and unique identity” (p. 96).

The question is: which construct fits as helping an individual focus on their surroundings and diminishing the importance of their self, thereby improving poor mental health symptoms such as low positive affect? Put another way, which of these variables enable awe to improve an individual’s affect? Numinous experience is relevant but not frequently included in the research literature on awe. Flow is a related concept but is not quite the variable that explains the effects of awe. Level of self-focused attention, however, could make sense as an important factor in the positive outcomes of awe because it involves a change of focus, as does awe. Small self seems to result from one’s transcendence of themselves, which could also be a mechanism by which awe helps individuals overcome mental health issues. Given that high levels of self-focused attention relate to poor mental health, a lower level of self-focused attention may have mental health benefits. Given that awe correlates with lowered SFA, it may be possible that SFA mediates the relationship between awe and positive affect, with positive affect serving as a measure of mental health in this instance. Similarly, awe is categorized as a self-transcendent experience; it makes individuals feel small. Therefore, it may be possible that the level of self-transcendence on experiences would also serve as a mediator for the relationship between awe and positive affect.

## **Current Awe Research**

Awe was heavily researched in relation to religion in the 1990's but received less research attention during the three decades that followed. Currently, awe is considered a “hot topic” in psychology and the mainstream press (Schneider, 2017), a resurgence that began with Keltner and Haidt's (2003) well-known article outlining the currently used general definition of awe and providing multiple methods of inducing it. In general, there are multiple methods of study in awe research that have been shown to be valid and reliable.

### ***Induction of Awe***

Most quantitative studies on awe have examined the experiential form of awe by inducing it in the laboratory (Schneider, 2017). One commonly used method of inducing awe for the purposes of research is brief exposure to vast landscapes and nature scenes through video, virtual reality (VR), and photographs (Chirico & Gaggioli, 2018). Although inducing awe in the laboratory this way has been shown to be effective, it may be vastly different than the awe that people experience in everyday life. It is for this reason that methods such as writing and live exposure are utilized in many studies.

The use of writing as a tool for therapeutic clients to express themselves to work towards healing and personal growth can be referred to as writing therapy or expressive writing. Writing has been found to have therapeutic effects and provides benefits for physical and psychological health (Nicholls, 2009). It is hypothesized that these benefits are due to the writer accepting their emotions and making sense of events (Pennebaker, 1997; Smyth & Pennebaker, 2008). Writing can also be used to induce desired outcomes and emotions. For example, clients can write for forgiveness, wisdom, gratitude, and hope (Ruini & Mortara, 2022). Past research has used expressive writing to effectively induce feelings of awe in the laboratory (Jiang & Sedikides,

2021). For example, Bai et al. (2017) were able to induce awe to a similar extent through natural settings, video clips, and a recollection of past awe experience, finding that the effects of awe generalize across elicitors (though Keltner & Haidt [2003] argue that the elicitor can change the “flavor” of an awe experience). Writing as a method of inducing awe is an effective method that allows individuals to experience awe in a way that is meaningful and specific to them. It is possible that writing about awe experiences could be an effective therapeutic technique for inducing awe and positive affect as well.

As an original contribution, I tested differences in Cohen’s  $d$  (effect size) for three studies. The purpose of doing so was to further validate the use of narrative recall of an awe experience as an awe induction method. Two of these studies did not provide the necessary information to run these tests; one was missing the sample sizes, and the other was missing the standard deviations. Piff et al. (2015), however, induced awe in five studies, each using a different method. In my comparison of Cohen’s  $d$  for induction of awe via writing recall versus video, I found the effects size to be large for both methods. Still, the effect size for the video recall induction ( $d = 2.39$ ) was far larger than the effect size for the video induction ( $d = 1.28$ ). This comparison confirmed the validity of using writing as an awe induction technique, which informed the ultimate decision about awe manipulation method for the current study.

## **The Current Study**

### **Research Questions and Hypotheses**

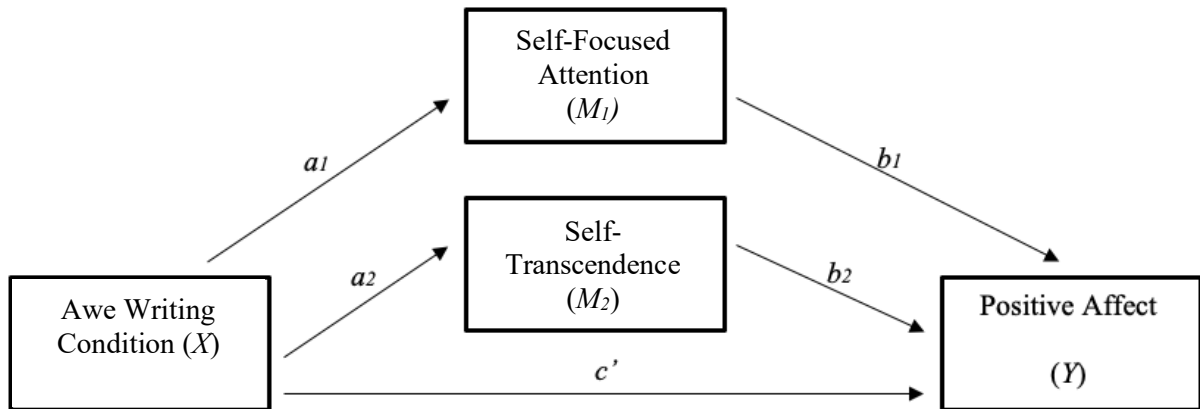
People can utilize writing to induce and process emotions with minimal resources or constraints (Pennebaker, 1997; Smyth & Pennebaker, 2008). Previous research has shown that writing about a previous awe-inducing event can enable individuals to re-experience that awe (Bai et al., 2017; Jiang & Sedikides, 2021; Piff et al., 2015). The present study utilized this

writing technique to investigate the relationship between writing-induced awe and positive affect, as well as to investigate potential mediators for the relationship (self-focused attention and self-transcendence). The research questions for the current study were as follows: Does writing about a previous awe-inducing experience induce awe in the writer more than writing about a neutral experience? How does the re-experiencing of awe impact an individual's level of positive affect? Does level of focus on the self serve as a mediator for the relationship between induced re-experiencing of awe and positive affect? Does level of self-transcendence serve as a mediator for the relationship between induced re-experiencing of awe and affect?

Previous research has found that it is possible to successfully induce awe through writing (Piff et al., 2015; Yaden et al., 2019). Additionally, previous research has shown that awe is related to mood improvement (Chirico & Yaden, 2018; Nelson-Coffey et al., 2019; Schneider, 2020). It is for this reason that positive affect was used as the outcome variable in this study. Thus, I hypothesized that the re-experiencing of awe would lead to increased self-transcendence and decreased self-focused attention, and these variables, in turn, would lead to increased positive affect because of the greater levels of present awareness. In this model, self-focused attention and self-transcendence served as mediators for the relationship between induced re-experiencing of awe and positive affect, such that writing about awe ( $X$ ) lead to lower self-focused attention and higher self-transcendence ( $Y$ ), which lead to greater positive affect ( $Z$ ). These served as parallel mediators in a single mediation model, as shown in the figure below based on models by Kane and Ashbaugh (2017).

**Figure 1**

Proposed Model of Mediation for the Current Study based on Kane and Ashbaugh (2017)



This means that participants who wrote about awe-inspiring experiences would experience more awe in the moment than those who wrote about a neutral event (something they did recently, such as studying or driving). Additionally, participants who wrote about awe would experience overall more positive affect in the moment than those who wrote about a neutral event. Finally, the association between the writing intervention and positive affect would be mediated by lower self-focused attention and higher self-transcendence.

## CHAPTER III: METHOD

### Participants

To determine how many participants would be needed to reach a power level of 0.80 in this study, I utilized the Monte Carlo power analysis simulation tool created by Schoemann et al. (2017). In doing so, I used heuristics to assume that all variables would have a medium correlation, apart from the two mediators. I assumed the two mediators would be highly correlated because they are similar concepts. I also assumed that standard deviations would be 1.00 across the board. Given these assumptions, the simulation reported a minimum sample size of 357 for a power level of 0.80. Therefore, I intended to recruit at least 357 participants for this study.

There were 501 individuals who ultimately participated in this study. Of these, 70 were removed due to failure to complete the study and/or pass the attention check question. Thus, there were 431 participants ultimately included in this study. The participants were recruited through Illinois State University Department of Psychology's SONA system and given research credit for their participation. As a result of the study being conducted at in a university setting, it consisted entirely of college students. All participants were over the age of 18 years, with an average age of 19.71 ( $SD = 2.52$ ) years old. The sample was 83% female, 14% male, and 3% other (i.e., non-binary, gender fluid). Participants were 71% White, 10% African American, 10% Latinx, 3% Asian, 2% biracial, and 4% other. The sample consisted of 36% freshmen, 23% sophomores, 20% juniors, 20% seniors, and 1% graduate students.



## Measures

### Measures of Awe

Parts of the Awe Experience Scale (AWE-S; Yaden et al., 2019) were used as a manipulation check to measure the degree to which awe was induced for participants after their awe induction writing is completed. AWE-S is a 30-item scale that measures six aspects of the awe experience, allowing for a multifaceted understanding that includes altered time perception, self-diminishment, physical sensations, and connectedness, as well as the typical perceived vastness and need for accommodation (Yaden et al., 2019). There are 5 items per factor. An example item for this scale is “I had the sense of being connected to everything.” Each item is rated on a 7-point scale, from 1 = *strongly disagree* to 7 = *strongly agree*. In the initial AWE-S study by Yaden et al. (2019), the subscales demonstrated high reliability—altered time perception  $\alpha = .91$ , self-diminishment  $\alpha = .89$ , connectedness  $\alpha = .87$ , vastness  $\alpha = .85$ , physical sensations  $\alpha = .81$ , and need for accommodation  $\alpha = .80$ —and the scale demonstrated high reliability overall ( $\alpha = .93$ ). Additionally, factor loadings were between .4 and .8. The AWE-S also demonstrated strong convergent validity with the awe subscales of the modified Differential Emotion Scale (mDES) and the Dispositional Positive Emotion Scale (D-PES).

For this study, participants were provided with one question from each facet of the AWE-S and asked to “answer regarding your writing experience” (either an awe experience or a neutral experience). This is consistent with methods of previous studies measuring awe through writing (Piff et al., 2015; Yaden et al., 2019). Thus, the measure of awe included six questions from the AWE-S scale. The reliability of these questions was  $\alpha = .75$ . In addition to these six questions, the measure of awe included distractor questions from Bai et al. (2017), such as “I felt anger.”

### **Self-Transcendence Scale**

The Self-Transcendence scale was used to measure participants' levels of self-transcendence. Jiang et al. (2018) created this 4-item scale ( $\alpha = .74$ ). They provide no validity data for the scale. Participants are instructed to indicate their level of agreement or disagreement with the statements based on how they are feeling in the moment. This scale contains items such as: "I can move beyond the things that once seemed so important," and "I want to find answers to some universal spiritual questions." Participants can respond on a scale from 1 = *strongly disagree* to 7 = *strongly agree*. For the current study, reliability measures were  $\alpha = .74$ .

### **Self-Focused Attention Subscale of the Focus of Attention Questionnaire (FAQ)**

Participants completed the self-focused attention subscale of the FAQ, an additional measure designed to assess self-focused attention (Woody, 1996). This subscale contains 5 items which participants can respond to in a range from 1 (*strongly disagree*) to 5 (*strongly agree*) based on their present state. The FAQ is meant to be given immediately following a task, and questions are meant to assess an individual's experience with that task. The questionnaire includes the following items: "I focus on what I will say and do next," "I focus on the impression I am making in social situations" "I focus on my level of anxiety," "I focus on my internal bodily reaction (for example, heart rate)," and "I focus on past social failure". Interitem correlations range from .36 to .70 ( $\alpha = .76$ ). In addition, all items loaded strongly onto the expected scales. The FAQ has since been used in numerous studies on self-focused attention (e.g., Bai et al., 2017). For the current study  $\alpha = .68$ . Since this alpha is relatively low, I evaluated how it would differ with items on the scale removed. With any of these items removed, alpha actually became lower or stayed the same: "I focus on what I will say and do next" ( $\alpha = .68$ ), "I focus on the impression I am making in social situations" ( $\alpha = .63$ ), "I focus on my level of anxiety" ( $\alpha = .55$ ),

“I focus on my internal bodily reaction (for example, heart rate)” ( $\alpha = .64$ ), and “I focus on past social failure” ( $\alpha = .65$ ).

### **Positive and Negative Affect Schedule (PANAS)**

Participants also completed the part of the PANAS (Watson et al., 1988), which is a 20-item scale that measures positive (*enthusiastic, active, alert*) and negative (*distressed, irritable*) affect. The initial study by Watson et al. (1988) found reliability for present-moment rankings to be acceptable for both the positive ( $\alpha = .89$ ) and negative ( $\alpha = .85$ ) affect subscales. The scale was also found to have high convergent validity with previous well-validated mood descriptors (Zevon & Tellegen, 1982).

For this study, the instructions read: “Indicate to what extent you feel this way right now, that is, at the present moment” for the 5 positive feelings/emotions that appear last on the PANAS (on the second half) (Watson et al., 1988). Participants rated their feelings on a scale from 1 = *very slightly or not at all* to 5 = *extremely*. For the current study  $\alpha = .82$  for the pre-test affect and  $\alpha = .84$  for post-test affect.

### **Procedure**

This study used a between-subjects research design. The study took place completely online through Qualtrics. After giving their informed consent, all participants were asked for demographic information, including gender, cultural background, age, and year in school. Participants were then asked to provide a baseline measure of their affect (using the PANAS items). Next, participants were randomly assigned to either the awe or neutral condition. The participants in the awe condition were to recall and write about a time when they had an experience that elicited awe for them. Participants in the neutral condition were asked to recall

and write about something general that they did recently. The specific instructions were adapted from Pennebaker (1997), Piff et. al. (2015) and Yaden et al. (2019) and are as follows:

Awe: Please take a few minutes to think about a particular time when you felt intense awe. This could be a time when you encountered a natural scene like a sunset, felt a uniquely deep sense of connection, or had an epiphany. Now that you have chosen a SINGLE experience of intense awe, please describe your experience in the box below. While you are writing, please focus as much as possible on the experience itself, rather than what led up to it, what happened afterwards, or your interpretation of the experience. Don't worry about spelling, grammar, or sentence structure. The only rule is that once you begin writing, continue to do so until you have reached at least 500 characters (just about filled up the text box).

Neutral: Please take a few minutes to think about something typical that you did fairly recently. This might have been riding a bike, studying for a test, or any other thing that happened during your day. Now that you have chosen a SINGLE experience, please describe your experience in the box below. While you are writing, please focus as much as possible on the experience itself, rather than what led up to it, what happened afterwards, or your interpretation of the experience. Don't worry about spelling, grammar, or sentence structure. The only rule is that once you begin writing, continue to do so until you have reached at least 500 characters (just about filled up the text box).

Participants who did not reach the minimum of 500 characters were not able to continue with the study, and their data were not included in analyses. As indicated above, in their writing, they were asked to describe the experience, how they felt, and what they were thinking in as

much detail as possible, without concern for grammar or spelling, in keeping with Pennebaker's (1997) studies on writing as a therapeutic process.

Participants in both conditions were then asked to fill out the awe measures in order to measure the level of awe induced by the experience they had written about on each subscale. Participants were asked to answer specifically regarding the writing experience described in their narrative, as done in previous studies (Piff et al., 2015; Yaden et al., 2019). Then, they ranked their level of agreement with each statement on the FAQ and self-transcendence scale. Next, they completed the PANAS items to measure their level of positive affect following the manipulation. Once all scales were completed, participants were provided with a debriefing statement. The individual difference approach to order of questionnaires was used; it was a fixed order so that the only reason for differences would be individual differences. The order of the procedure followed the order of the proposed mediation analysis; it was consistent with the presumed temporal order of the variables in the mediation model.

## CHAPTER IV: RESULTS

### Data Analysis

It is likely that the relationship between awe and positive affect is complex and multifaceted. In cases such as these, simple mediation models with only one mediator tend to fall short of providing a complete story (Kane & Ashbaugh, 2017). Therefore, I used a parallel mediation model with two mediators (self-transcendence and self-focused attention), which allowed for a more complex understanding of the process by which awe impacts positive affect. It was expected that the path from awe writing condition to self-transcendence (as indicated in Figure 2) would be positive, but the path from awe writing condition to self-focused attention would be negative. Similarly, the path from self-transcendence to positive affect would be positive, and the path from self-focused attention to positive affect would be negative. Finally, the path from awe writing condition to positive affect would be positive.

This analysis had three regression equations. In the first equation, condition was the predictor variable, and STE was the criterion variable:

$$\widehat{STE} = b_0 + b_1 (\text{condition})$$

In the second equation, condition was the predictor variable, and SFA was the criterion variable:

$$\widehat{SFA} = b_0 + b_1 (\text{condition})$$

In the third equation, SFA, STE, and condition served as predictor variables, and positive affect served as the criterion variable:

$$\widehat{\text{positive affect}} = b_0 + b_1 (\text{SFA}) + b_2 (\text{STE}) + b_3 (\text{condition})$$

In order to assess the significance of the slopes, I used *t*-tests. To measure the amount of variance predicted by each predictor, I looked at  $R^2$  and its significance level. For all significance tests, I held an alpha level of .05.

## Preliminary Findings

A series of Pearson correlations are shown in Table 1. Individuals' level of awe was significantly correlated with self-transcendent experience, self-focused attention, and post-test affect. Self-transcendent experience was also significantly correlated with self-focused attention and post-test affect. Pre-test affect was significantly correlated with all variables except self-focused attention and condition. Condition was significantly correlated with awe, self-transcendent experience, and post-test affect.

**Table 1**

*Correlations, Means, and Standard Deviations among Measures*

Measure	1	2	3	4	5	6
1. Condition	--					
2. Affect (pre)	.05	--				
3. Awe	.54***	.18***	--			
4. STE	.16***	.27***	.36***	--		
5. SFA	-.01	-.02	.11*	.22***	--	
6. Affect (post)	.10*	.71***	.30***	.35***	.08	--
<i>M</i>	.49	3.16	3.95	5.21	3.65	3.48
<i>SD</i>	.50	0.80	1.14	1.17	0.72	0.82

*Note.* Range of scores: affect: 1-5; awe: 1-7; STE: 1-7; SFA:1-5

*Note.* Writing condition coded 0: neutral, 1: awe.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

A hierarchical regression analysis was run to assess the extent to which post-test positive affect self-reports varied based on condition. Pre-test positive affect was entered in Step 1, and it explained a significant portion of the variance in post-test affect,  $R^2 = .51$ ,  $F(1, 429) = 445.03$ ,  $p < .001$ . Participants' condition was entered in Step 2 and did not significantly predict post-test positive affect reported above and beyond pre-test affect,  $\Delta R^2 = .004$ ,  $F(1, 428) = 3.80$ ,  $p = .052$ . These results indicate that participants' condition did not significantly predict their level of post-test positive affect beyond that of their pre-test affect. Pre-test affect and condition combined to explain 51% of the variance in post-test affect,  $F(2, 428) = 225.87$ ,  $p < .001$ .

An independent samples  $t$ -test was run to assess whether awe levels were significantly different between the control and awe group. There was a significant difference in awe levels between these groups,  $t(429) = -13.18$ ,  $p < .001$ . There was also a large effect size,  $d = .97$ . This indicates that the writing task was effective at inducing awe in this study.

### **Main Analyses**

I hypothesized that the re-experiencing of awe would lead to increased self-transcendence and decreased self-focused attention, and that these variables, in turn, would lead to increased positive affect because of the greater levels of present awareness. In this model, self-focused attention and self-transcendence would serve as mediators for the relationship between induced re-experiencing of awe and positive affect, such that writing about awe ( $X$ ) would lead to lower self-focused attention and higher self-transcendence ( $Y$ ), which would lead to greater positive affect ( $Z$ ). This meant that participants who wrote about awe-inspiring experiences would experience more awe in the moment than those who wrote about a neutral event (something they did recently, such as studying or driving). Additionally, participants who wrote about awe would experience overall more positive affect in the moment than those who wrote about a neutral



event. Finally, the association between the writing intervention and positive affect would be mediated by lower self-focused attention and higher self-transcendence. PROCESS model 4 was used to test these hypotheses (Hayes, 2022).

As Figure 3 illustrates, the unstandardized regression coefficient between awe condition and SFA was not statistically significant,  $b = -0.02$ ,  $t(429) = -.27$ ,  $p = .79$ . The coefficient between SFA and positive affect was also not statistically significant,  $b = .01$ ,  $t(427) = .11$ ,  $p = .92$ .

The coefficient between awe condition and STE was statistically significant,  $b = .36$ ,  $t(429) = 3.27$ ,  $p = .001$ . The coefficient between STE and positive affect was also statistically significant,  $b = 0.24$ ,  $t(427) = 7.22$ ,  $p < .001$ .

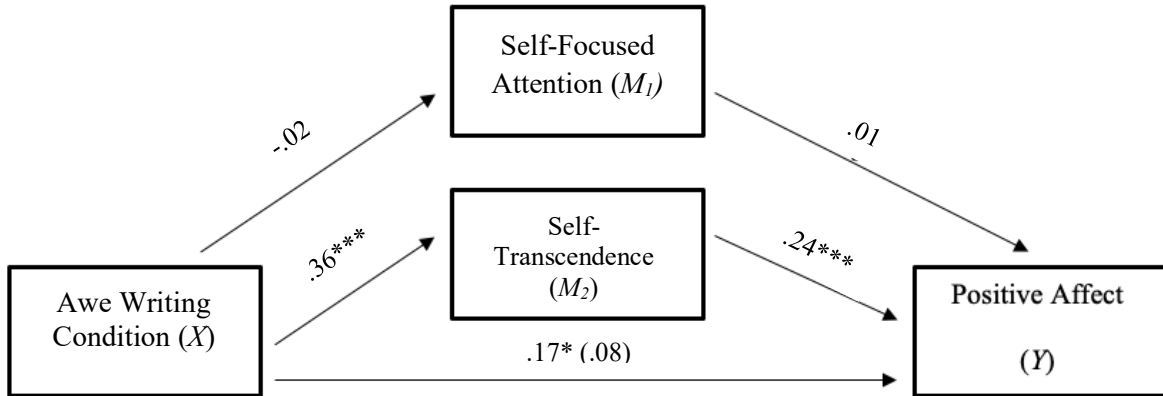
The direct effect of condition on post-test positive affect was not statistically significant,  $b = .08$ ,  $t(427) = 1.03$ ,  $p = .30$ . Approximately 12% of the variance in positive affect was accounted for by the three predictors,  $R^2 = .12$ ,  $F(3, 427) = 20.07$ ,  $p < .001$ .

The unstandardized indirect effect for SFA was  $-.00$  and for STE was  $.08$ . I used bootstrapping procedures to test the significance of this indirect effect. I used the sample of 431 participants as a population reservoir from which to draw 10,000 samples of 431 participants, with replacement. I computed the unstandardized indirect effects for each of the 10,000 bootstrapped samples. To compute the 95% confidence interval, the indirect effects were determined at the 2.5th and 97.5th percentiles. Ultimately, the bootstrapped unstandardized indirect effect was  $-.00$  for SFA and the 95% confidence interval ranged from  $-.001$  to  $.001$ . This indirect effect was not statistically significant. The bootstrapped unstandardized indirect effect was  $.08$  for STE and the 95% confidence interval ranged from  $.03$  to  $.15$ . This indirect effect was

statistically significant. The overall indirect effect was .08 and the 95% confidence interval ranged from .03 to .15. Thus, the overall indirect effect was statistically significant.

**Figure 2**

*Unstandardized Regression Coefficients for the Current Study*



*Note.* Writing condition coded 0: neutral, 1: awe. Coefficient in parenthesis is controlling for mediators.

\* $p < .05$ . \*\* $p < .01$ . \*\*\*  $p < .001$ .

## CHAPTER V: DISCUSSION

The general purpose of this study is to investigate how awe might lead to improved affect. In doing so, I address the mechanism by which awe has therapeutic effects in an effort to (a) increase knowledge of awe in general, (b) increase knowledge of what makes certain experiential alternatives to talk therapy effective, and (c) assess the effectiveness of writing about awe experiences as a more direct method of accessing the benefits of awe. The overall proposed mediation model was not supported, however the path from condition to self-transcendent experience to positive affect was significant. This provides support for self-transcendence as a mechanism by which awe improves affect. Additionally, the awe recall writing intervention did relate to significantly greater feelings of awe than the neutral writing intervention, indicating that writing about awe may be an effective method of inducing it.

Preliminary findings indicated that the condition participants were in did not predict a significant amount of variance in their post-test affect above and beyond the variance in pre-test affect. This could indicate that participants may have been coming into the study with significant individual differences in their mood that contributed to differences in test condition outcomes on affect measures; pre-test awe predicted more variance in post-test affect than condition did. However, condition and post-PA were significantly correlated, and the hierarchical regression showed that  $p = .052$  when controlling for pre-PA. This provides evidence that condition could still have had an important impact on post-PA.

I hypothesized that participants in the awe writing condition would experience more awe in the moment than those in the neutral writing condition. This hypothesis was supported, as those who in the awe condition did experience more awe than those in the neutral condition, as measured by the AWE-S. This is consistent with the preliminary examination of effect sizes

from prior studies done in chapter 2, which indicated an effect size of  $d = 2.39$  for writing recall of awe. Although the effect size wound up being smaller for this study, there was also a large effect size here,  $d = .97$ . These results are in line with previous studies which have found that it is possible to induce awe via writing manipulations (Bai et al., 2017; Jiang & Sedikides, 2021; Piff et al., 2015).

Finally, I hypothesized that awe condition and positive affect would be mediated by level of SFA and STE. In this model, SFA and STE served as parallel mediators in a single mediation model, as shown in Figure 2. While STE did serve as a mediator for the relationship between awe and positive affect, SFA did not. Thus, the hypothesized model was not fully supported. The reason for the model's lack of support is that the level of SFA did not vary significantly based on writing condition, and SFA did not predict PA. This is inconsistent with research showing that lowered levels of SFA are correlated with awe experiences, self-transcendence, and positive affect (Brockmeyer et al., 2015; Mor & Winquist, 2002). This could be an issue of operational definition. As discussed in the *focus on the self* section, there are multiple ways to describe the general concept of a lowered focus on oneself. It may be that one of these other constructs (i.e., small self or flow) would have been a better fit for the model. It is also possible that this is an issue of measure, as the FAQ, which was used to measure self-focused attention, did not have validity information connected to it. The FAQ had the lowest reliability of all measures used. Reliability did not change even with items removed. It is possible that the scale was inconsistent and not measuring what it was intended to measure. It may also simply be that, though awe and positive affect are correlated with lowered SFA, SFA is still not part of the mechanism by which awe improves affect.

The other indirect effect where the relationship between awe and positive affect is mediated by STE, however, was supported. This means that the awe writing condition was effective at increasing levels of self-transcendence, and self-transcendence was correlated with level of positive affect. As mentioned in previous sections, self-transcendent experiences are “temporary feelings of unity characterized by reduced self-salience and increased feelings of connection” (Yaden et al., 2017, p. 1). There is a reduced awareness of one’s physical self that is known to occur with such experiences (Newberg et al., 2001; Urgesi et al., 2010). Similarly, awe is categorized as a self-transcendent experience, making individuals feel small. Therefore, it is fitting that the level of self-transcendence would serve as a mediator for the relationship between awe and positive affect, as predicted. This finding may mean that the feelings of unity and connection, with decreased self-salience (all parts of self-transcendence) are a key part of the relationship between awe and positive affect. This is consistent with Yaden et al. (2017) who identify awe as a construct with a self-transcendent aspect.

Although previous studies (e.g., Yaden et al., 2017) have shown that awe is related to self-transcendent experience and that experiencing awe can improve affect, this is the first to demonstrate that self-transcendent experience is an important part of the path between awe and positive affect (Dong & Ni, 2020; Keltner & Haidt, 2003). This finding provides evidence for Hendricks' (2018) model that the administration of psychedelics leads to awe, which leads to small self/ego dissolution, and in turn, to self-transcendence and higher long-term positive affect, among other things. These findings also lend support to the idea that awe and ego dissolution are part of the reason why natural environments improve mood in the way that they do (Anderson et al., 2018).

This study also replicates previous research. It replicated research showing that awe narratives are capable of inducing awe (T. Jiang & Sedikides, 2021; Piff et al., 2015b). It also replicated research showing that awe improves affect, while adding the nuance that it does not do so above and beyond pre-test affect (Yaden et al., 2017).

### **Limitations and Future Research Directions**

These results should be interpreted with study limitations in mind. One limitation was the use of self-report measures to report various emotional experiences in the moment, though the intervention had happened previously. The transient nature of emotion leads us to question how much the emotion had faded by the time participants were asked to report. Whenever using self-report measures, the accuracy of participants' reports may be questionable. After all, we are relying on subjective reports of participants' experience. Two people experiencing the same thing may provide very different subjective reports based on their own interpretation. Additionally, participants' memories of their emotional experiences may be inaccurate.

Another limitation is the method of inducing awe in this study. Although validated in previous research (Pennebaker, 1997; Piff et al., 2015b; Yaden et al., 2019), using writing to induce awe is not without its flaws. No matter how specific and concrete the task, interpretations of the instructions for writing will vary between individuals. In this study, there was not specific evidence that this was a problem, but there was not an extensive evaluation of the writing to ensure this. Narratives were only scanned to ensure that participants had written to the minimum length without writing something repetitive or entirely irrelevant. Thus, it is still possible that these issues impacted the study. Additionally, what constitutes awe will vary between individuals, leading to differences in the content of writing and potentially the extent of one's affect changes afterward. It may have been valuable to assess how closely the writing sample

addressed awe. For example, Pennebaker (1997) has developed text analysis tools that can assess the emotional content of writing samples. Making use of those could have been helpful here. Similarly, participants' writing was not read to ensure that they stayed on topic. Thus, it is possible that they wrote about something unrelated to the prompt, which would make their answers on the questionnaires invalid. In order to address this, it would have been useful to read and code participants' writing for relevance to the topic.

Another potential limitation was the use of the individual differences approach for the order of questionnaires. There was no counterbalancing in the order of questionnaires. It is possible that filling out measures of awe, STE and SFA could have had an impact on post-PA reports. Specifically, it is possible that the awe measure could have primed responses to the rest of the questionnaires by leading participants to think more about awe. If sticking with the individual differences approach, it would have been possible to at least counterbalance the two mediators. As an alternative, it could have been useful to assess post-PA before STE and SFA for half of the participants.

Alternative models of analysis also would have been possible and may have provided a clearer picture of how awe improves affect. For example, it might have been useful to run the same model but with awe or pre-test positive affect inserted between the condition and mediators. This would have allowed the mediation model to account for awe as a part of the process.

Another limitation is the demographics of participants. Participants in this study were overwhelmingly white, female, college (likely psychology) students. They were mainly from western cultures as well. This limits the extent to which these findings can be generalized to the overall population. The background of participants likely impacted their relationship to awe and

the self. Although the literature review did confirm that awe is a universally experienced emotion, implications of it will vary between cultures (Halstead & Halstead, 2004). Elicitors will also vary (Bai et al., 2017). This leads to questions about whether awe narratives are capable of inducing awe across populations. Perceptions of the self also vary between cultures. According to (Markus & Kitayama, 1991), in American culture the self is salient, independent, autonomous and unique to the individual, while some Asian cultures focus on interdependence and the self is less salient, inseparable from the others around them. Knowing this, it is likely that those in Asian cultures will be more apt to report lowered focus on the self, if they report any focus on the self at all. For many, the question of focus on the self may not even make sense as a question to ask. For western cultures, it may be more difficult for individuals to feel a lowered focus on the self since an autonomous sense of self it is so integral in the culture. For this reason, reports of self-transcendence may be lower in this sample than they would be in the overall population.

Future studies are needed on this topic. This study focused on SFA and STE as potential mediators of the relationship between awe and positive affect, but there are other factors that may play a role as well (e.g., mindfulness and openness to experience). Closer to this study, there are also other factors relating to focus on the self that may have been a better fit in the mediation model (e.g., self-smallness, numinous experience, flow). Additionally, this study chose one of many methods of inducing awe. Other mediators or methods of inducing awe could have provided a better picture of the relationship between awe and positive affect. Future studies may explore these relationships through multiple studies, varying awe induction techniques between them (e.g., writing induction, live induction, or video induction). For example, it may be useful to test whether a different awe induction technique would have a greater impact of SFA than the writing task did. This would help us to see how various awe induction techniques impact one's



experience of awe. It may also be useful to measure the personality of participants since disposition could play a role in the strength and frequency of awe experience (Yaden et al., 2017).

### **Implications**

This study has practical and theoretical implications for clinical and counseling psychology as well as emotion research in general. First, this study provides further validation of writing as a method of inducing emotion, specifically awe. This technique can be used in a therapeutic context. In general, alternatives to talk therapy, such as psychedelic and nature-based therapies have proven effective in helping with issues such as depression, anxiety, bipolar disorders, and so on (Hendricks, 2018; Noorani et al., 2018; Schertz & Berman, 2019). The mechanisms by which these therapies have their effects is not yet certain. One of the commonly proposed ways in which these therapies differ from traditional methods is their consistent induction of awe and ability to provide shifts in perspective through experience (Anderson et al., 2018; Hendricks, 2018). This study provided further information on the mechanism by which awe may provide these shifts in affect, part of it being self-transcendence.

Theoretically, this study increased knowledge of awe in general. Awe is a particularly complex emotion, with power to influence both positively and negatively. The question of why awe leads to positive affect is not answered definitively. Still, these findings can contribute to the literature on awe and self-transcendent experiences. Self-transcendence seems to be a helpful direction to take the research on the mechanisms of the awe-PA relationship.

Overall, this study addressed the mechanism by which awe has therapeutic effects in an effort to increase knowledge of awe in general, increase knowledge of what makes certain

experiential alternatives to talk therapy effective, and assess the effectiveness of writing about awe experiences as a more direct method of accessing the benefits of awe.

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