

INDUCING AWE WITH NATURE VIDEOS: EFFECTS ON HOPE, STRESS, AND SOCIAL
CONNECTEDNESS

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University in fulfillment of the requirements for the degree of Doctor of Clinical Psychology

By

Jennifer Yoe

Committee Chair: Dr. Sam Castelblanco

Committee Members: Dr. David McCord & Dr. Annie Wilson

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ABSTRACT

INDUCING AWE WITH NATURE VIDEOS: EFFECTS ON HOPE, STRESS, AND SOCIAL CONNECTEDNESS

Jennifer Yoe. M.S.W., M.A

Western Carolina University (June 2024)

Director: Dr. Sam Castelblanco

This study explored the potential of awe-inducing nature videos to elicit positive mental health outcomes. Building on prior research linking natural environments to awe, the study focused on elements of vastness and accommodation inherent in awe-inducing stimuli. Using nature videos, this study aimed to determine if these could induce awe comparable to real-life experiences and whether such awe was associated with reduced stress, increased hope, and motivation to foster social connections. Participants ($N = 102$) from Prolific were randomly assigned to view either an awe-inducing video or a neutral video. Standardized measures assessed awe, stress, hope, and social connection motivation post-viewing. Results revealed that participants exposed to the awe-inducing video reported significantly greater awe ($M = 4.171$, $SD = 1.294$) than those in the control group ($M = 2.780$, $SD = 1.100$), $t(99) = -5.836$, $p < .001$, with a large effect size ($d = -1.164$). However, there were no significant differences in stress between the awe-inducing video ($M = 5.021$, $SD = 2.279$) and control ($M = 5.755$, $SD = 2.800$) conditions, $t(98) = 1.425$, $p = .157$. Similarly, motivation to foster social connections was not significantly different between groups (Awe: $M = 4.311$, $SD = 1.506$; Control: $M = 4.563$, $SD = 1.601$), $t(99) = 0.812$, $p = .419$. Although hope did not differ significantly between conditions (Awe: $M = 5.128$, $SD = 1.484$; Control: $M = 5.583$, $SD = 1.438$), $t(99) = 1.565$, $p = .121$, awe significantly mediated the

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relationship between video condition and hope, suggesting that the increase in awe was crucial for the positive effect of the awe-inducing video on hope (indirect effect: $b = 0.489$, $SE = 0.234$, 95% $CI [0.097, 1.003]$). These findings highlight the use of nature videos to induce awe and the role of awe in enhancing hope.

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CHAPTER ONE: INDUCING AWE WITH NATURE VIDEOS

The use of the nature to Increase positive outcomes in mentally ill patients dates back to the 1800's when a group of Quakers began implementing nature, such as greenhouses and animals, into the treatment plans of patients at Friends Hospital in Philadelphia, PA (Association for Experiential Education, 2016). In the early 1900's, the Manhattan State Hospital moved tuberculosis patients to tents outdoors due to overcapacity within the hospital (Berman & Berman, 1994). Hospital staff began noting positive physical and mental health improvements in these patients who were housed outdoors. Overall, staff reported a general contentedness within the milieu and many of the patients discharged much earlier than expected. The results were so dramatic that more patients were moved outdoors and again, the same overall physical and mental health improvements were noted (Berman & Berman, 1994). Documentation of the staff's observed results is sparse however, in 1906, a similar pattern was noted in patients who were housed at Agnews State Hospital, known as the Great Asylum for the Insane, during the catastrophic earthquake of 1906 (Hoisholt, 1906; Pearce, 2013). The surviving patients of Agnews were moved to tents on the grounds and staff began to notice significant positive changes in these patients' behaviors. The positive outcomes were so remarkable that Dr. Andrew Hoisholt published his account of these outcomes in *The American Journal of Insanity* noting that, patients were more content, previously violent patients were peaceful, and he even noted a decrease in epileptic seizures (Hoisholt, 1906). In reference to one patient, he stated, "the record of the patient's condition and conduct during the first two or three weeks of this enforced outdoor life certainly speaks well for tent-treatment" (Hoisholt, 1906, p.132). This publication was seminal in the implementation of tent therapy in other asylums treating mental health patients (Berman & Berman, 1994).

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The success of tent therapy paved the way for new therapeutic approaches utilizing nature, namely, camping therapy (Berman and Berman, 1994). Camping therapy holds particular significance in the history of nature therapy because these camps were the first nature-based therapeutic modalities that attempted to measure effectiveness by establishing therapeutic goals and measuring through observation, self-reports, and rating scales. Through these attempts, important foundations of nature therapy were observed and introduced as potential explanations for noted positive outcomes. Of these explanations, the most salient for the current research is simply, the uniqueness of the natural environment may account for the positive outcomes noted in nature therapy research (Berman & Berman, 1994).

Nature-Based Research

Research continues to support the use of nature-based programs as a treatment modality for an ever-growing number of populations including adolescents (Bowen et al., 2016; Norton et al., 2014), families (Fletcher & Hinkle, 2002), women (Powch, 2008), military veterans (Duvall & Kaplan, 2013; Gelgopf et al., 1996; Hyer et al., 1996), college students, trauma survivors, victims of abuse, and people suffering from physical disease (Berman & Kaplan, 2008; Fletcher & Hinkle, 2002; Ragsdale et al., 1996; Tucker & Norton, 2013). Wide-ranging effects have been noted such as decreased symptoms of depression and anxiety, increased feelings of empowerment, increased emotional and social connectedness, increased overall well-being, better social functioning and a more positive outlook on life (Harper & Russell, 2008; Powch, 2008; Ragsdale et al., 1996). However, despite gains in the rigor and quantity of the research on nature-based therapy, the field has yet to specify with certainty what component or combination of components is contributing to the effectiveness of this treatment modality (Bloomfield, 2017).

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Aforementioned was the uniqueness of the natural environment as an explanation for the positive outcomes noted in nature therapy research (Berman & Berman, 1994). However, that explanation is insufficient to draw any clear conclusions between nature and positive health outcomes. Nature, in its essence, is comprised of an infinite number of elements that could be at work in creating these outcomes (Bloomfield, 2017). Thus, there exists a haziness to exactly what aspects of nature are producing these outcomes. As such, the extant research is limited by lack of specificity and subsequent lack of control needed to connect distinct aspects of nature with positive outcomes.

Aesthetic Qualities of Nature

Lack of specificity and control pervade outdoor therapy research, but a growing body of research supports the influence of nature aesthetics on these noted positive mental health outcomes (Gillis, 1996). Gillis (1996) suggests that simply being in nature, seeing nature, and experiencing nature could be a significant influence on the success of these programs. Ulrich (1981) discusses the theory of aesthetics, acknowledging the multisensory perception involved in nature experiences and emphasizing the predominant role of vision in gathering information about a natural environment. Research in nature and outdoor therapy, experiential therapy, and psychological and nature aesthetics supports the idea that the visual components of nature are, at least in part, responsible for many of the positive outcomes noted in research and theory (Kaplan, 1993; Shafer & Richards, 1974; Ulrich, 1984, Raanas et al., 2011). Utilizing visual representation of nature has been reported to decrease stress, increase positive affect, and restore attention (Bratman, 2012; Honeyman, 1990; Ulrich, 1979; Ulrich, 1981). However, what specific visual aspects of nature are most likely to lead to positive outcomes has yet to be specified with robust support.

Experiential Aspect of Aesthetics

Previous qualitative research, aimed at examining aspects of nature involved in positive outcomes, has identified water (Maslow, 1968; Ryback & Yaw, 1976), wild animals (DeMares & Krycka, 1998), sunsets (Ebersole, 1972; Vogler, 2012) and forests (Williams & Harvey, 2001) as potential catalysts for positive mental health outcomes. However, it is more complicated than just a stimulus (e.g., nature) causing a response (e.g., positive mental health outcomes). There is an underlying experiential process; something happens to the participants when they see these aspects of nature that, in turn, effects the way they feel (Cambridge University Press, n.d.). This experience has been defined in previous research as a peak or transcendent experience defined as: a highly valued moment (Laski, 1961; Maslow, 1962; Maslow, 1964; Maslow, 1971; Privette, 2001), a moment of highest happiness and fulfillment (Maslow, 1962), moment of ecstasy (Laski, 1961), and absorption in moment (Williams & Harvey, 2001). Noble (1987) identified positive affect as one of the six main qualities of a transcendent experience, alongside ineffability (difficulty to express in words), noetic quality (profound understanding), transiency (brief duration), passivity (feeling overwhelmed), and unity (sense of interconnectedness). Noble (1987, p.602) suggests that positive affect involves feelings of “joy, peace, happiness, and absence of fear, wonder, awe, reverence, a sense of total acceptance, compassion, love, and forgiveness of ignorance and wrongdoing, a sense of perfection and sacredness of the universe.”

Awe

A majority of the words Noble (1987) used to describe positive affect relate to emotional states, i.e. joy, happiness, love. However, awe stood out as different from the others; the most current research on awe posits that awe is an experience, rather than an emotion as it has been

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historically categorized (Chirico, 2018). Konecni (2005, p.27) describes awe as, “the ultimate humanistic moment.” This emphasis on the momentary aspect of awe is in line with the above stated definitions of transcendent/peak experiences (Konecni, 2005; Laski, 1961; Maslow, 1971; Noble, 1987; Williams & Harvey, 2001). Konecni (2005) asserts that awe plays a primary role in human perception and response i.e. psychological aesthetic.

The most widely accepted prototype for awe was introduced by Keltner and Haidt (2003) and includes two basic features: vastness and accommodation. Firstly, vastness refers to the perception that something is bigger than the self, either in sheer size or in reference to power dynamics (Keltner & Haidt, 2003). Accommodation references Piaget’s theory on assimilation of new experiences (Piaget & Inhelder, 1969). Accommodation occurs when a person’s current mental schema needs to be changed to incorporate new information (Piaget & Inhelder, 1969). Keltner and Haidt (2003) suggest that the experience of awe occurs when something is so vast that a person fails to make sense of it therefore, needing to expand their current schema. Previous research on transcendent/peak experiences has been primarily confined to the qualitative research (Konecni, 2005; Laski, 1961; Maslow, 1971; Privette, 2001; Williams & Harvey, 2001). However, by identifying awe as a potential catalyst for the positive mental health outcomes noted in previous research and pinpointing natural environments that align closely with Keltner and Haidt’s (2003) prototype of awe, researchers can now explore inducing awe in more controlled environments to gain deeper insights into its effects on mental health.

Nature Videos as a Method to Induce Awe

Recent studies show a growing interest in exploring the impact of nature videos on inducing awe and investigating their potential benefits for mental well-being. These videos,

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characterized by their depiction of expansive and captivating natural scenes, have demonstrated the ability to evoke feelings of awe by immersing viewers in vast environments that simultaneously require accommodation. Such components are integral to the awe experience and its correlated advantages (Keltner & Haidt, 2003).

Studies have underscored the stress-reducing potential of nature videos. For instance, van der Wal et al. (2020) observed a significant decline in cortisol levels, a key marker of stress, following exposure to such videos. This corroborates earlier findings by Ulrich et al. (1991), who demonstrated the stress-alleviating effects of natural scenes, even when presented in video format. Moreover, Brown et al. (2018) reported diminished perceived stress levels among participants viewing nature videos compared to those exposed to urban scenes. These findings emphasize the promising role of nature videos in stress management, possibly by diverting attention from daily stressors and fostering relaxation (Bratman et al., 2015).

Watching nature videos has been linked to heightened feelings of social connectedness and an increase in prosocial behavior (Aknin et al., 2018). Similarly, research by Bai et al. (2017) demonstrated that exposure to nature videos elevated sensations of interconnectedness and collective involvement. These findings support the notion that awe experiences can engender a sense of being part of a broader whole, thus nurturing social connections (Piff et al., 2015). Consequently, these outcomes imply that nature videos may serve as a means to alleviate feelings of isolation and foster a sense of community, particularly beneficial for individuals experiencing social isolation (Yang et al., 2018).

Additionally, studies have shown that nature videos can positively affect mood and hope. Anderson et al. (2020) discovered that individuals exposed to these videos reported higher levels

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of hopefulness and positive emotions. They suggested that the natural beauty depicted in such videos can foster optimism and lift one's spirits. Similarly, Joye and Bolderdijk (2015) noted that virtual experiences of natural environments can offer psychological rejuvenation and a renewed sense of purpose. Furthermore, watching awe-inspiring nature videos may prompt the release of endorphins and dopamine, neurotransmitters linked to pleasure and reward, thereby improving mood and cultivating a more hopeful outlook (Shiota et al., 2007).

Nature videos also provide a practical and accessible means of delivering these benefits, particularly for individuals who may have limited access to natural environments. For instance, seniors, patients in hospitals, and individuals living in urban areas with few natural spaces can all benefit from the positive mental health outcomes associated with nature video exposure (Kjellgren & Buhrkall, 2010). Furthermore, a study by White et al. (2014) indicated that even short durations of exposure to nature scenes through videos can lead to significant improvements in mental well-being, making this an efficient intervention method.

It seems that nature videos can effectively induce awe and thereby potentially produce positive mental health outcomes, such as reduced stress, enhanced social connectedness, and increased hope. "These findings are supported by a growing body of research and suggest that nature videos could be a valuable tool in clinical settings to promote mental well-being.

Clinical Implications

The focus of the current study is the applicability within the clinical setting. With nature videos as a potential vehicle to deliver awe-inducing stimuli to viewers, the question becomes whether this type of stimuli can produce the same positive mental health outcomes seen in previous research. If findings suggest that videos can successfully produce the positive mental

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health outcomes that real nature experiences have claimed in the extant research, inducing awe with video nature environments to produce positive mental health outcomes has potential applicability within the various clinical settings. Specifically, accessing authentic nature may be difficult for some clients or clinicians due to any number of restrictions. For example, clients with chronic or acute physical disabilities, clients within inpatient medical and or mental health treatment facilities, or clients in urbanized areas with few resources to natural spaces.

Castelblanco's (2022) systematic scoping review of 240 virtual nature exposure studies revealed that virtual nature exposure has been utilized with women in labor, seniors, nursing home residents, elderly people with specific phobias, weight loss patients, and postoperative pediatric patients. All of the aforementioned populations are restricted in some manner to accessing natural environments and the virtual medium holds to potential to bridge that gap. Furthermore, mental health clinicians may be restricted from providing nature-based interventions due to client load, client risk status, their own personal physical restrictions, accessibility to natural environments, or organizational policy. Offering access to nature experiences within the traditional office setting may offer clinicians an adjunctive intervention to produce or support positive mental health outcomes.

One of the most recent research articles published on awe experiences posited that these experiences may have the potential to increase positive mental health outcomes in individuals diagnosed with Major Depressive Disorder (MDD) (Chirico, 2021). Depression is the most common mental health disorder worldwide with a prevalence ranging from 2- 21% (Gutierrez-Rojas, L. et al., 2020). Additionally, depression is often comorbid in populations with additional medical problems and disabilities (Kang, 2015). With awe as a potential mitigator of depressive symptoms and video nature environments as a potential vehicle for inducing awe, clinicians can

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begin to utilize videos in a variety of settings to increase positive mental health outcomes. The current research will examine nature video's ability to induce awe and measure positive mental health outcomes associated with the reduction of depressive symptomology such as increased hope, increased social connectedness, and decreased stress.

Hope

Hope is defined as the perceived capability to obtain desired goals and motivate oneself to initiate and sustain forward trajectory towards those goals (Snyder et al., 2000). Goals and pathways are defined as making plans to meet those goals (Snyder et al., 2000). Frank and Frank (1991) made the observation that clients entering into therapy often do so in a state of demoralization. This demoralization is brought on by exhausting their current capacity to reach the goals in their life. In short, these clients have lost hope because they are no longer able to either set goals, or successfully plan to meet those goals, or both (Frank & Frank, 1991). Wampold (2001) conducted a large quantitative review of psychotherapeutic effects and found that 70% of positive effects were due to common factors such as hope. This study highlighted the importance of a therapist's ability to instill hope in their clients. Previous awe studies have put a great deal of emphasis on positive mental health outcomes after experiencing awe but have not directly investigated hope as an outcome of these awe experiences. However, hope is a construct measured in numerous other areas related to positive psychology; hope is widely considered a mainstay of psychological well-being and mental health (Slezackova, 2017). As such, instilling hope is critical in treating clients with depression to combat the demoralization they present with and is worthy of examination within the current study (Anderson et al., 2018; Shiota et al., 2007; Stellar et al., 2015).

Social Connectedness

Social connectedness is defined as relational links between ourselves and others (Bernstein, et al., 2017). Two types of motivation around social connectedness exist: motivation to create new social connections and motivation to nurture the relationships that a person already has (Bernstein et al, 2017). However, people with depression are prone to rumination and self-referential thinking which stifles their motivation and subsequent ability to foster and nurture these connections (Chirico, 2021). Depressed individuals often experience social disconnection, characterized by fewer social connections, lower quality social connections, low levels of perceived social support, and the tendency to socially isolate (Chirico, 2021). Encouragingly, previous awe research found that the experience of awe led to a decrease in rumination centered around negative perceptions of self thus allowing individuals to seek and maintain connections and feel more supported (Tarani, 2017). This highlights the potential of awe experiences in decreasing depressive symptomology. Thus, is it worthy construct of examination within the current study.

Stress

Perceived stress is the degree to which situations in one's life are appraised as stressful (Cohen, 1988). Research supports the significant influence of stress on depression. In fact, there is considerable neuropsychological support on the role of stress in the provocation, precipitation, and exacerbation of depression (Pittenger & Duman, 2008; Van Praag, 2009). Hence, it is prudent for any intervention claiming to reduce depressive symptomology to examine the intervention's role on perceived stress as well. Previous research supports nature's role in reducing stress. In fact, a 2014 meta-analysis on the effects of nature contact found that contact

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with nature was significantly linked to a reduction in stress (Hartig et al., 2014). Additional studies have found a correlation between awe and stress reduction (Bai, 2021, Sturm et al., 2022). These studies highlight the importance of examining the potential of nature exposure to decrease stress in individuals struggling with depression.

Purpose

The purpose of this study is to examine the effect of awe, if induced by nature videos, on participants' perceived level of social connectedness, stress, and hope. This study aims to contribute to the literature on awe and nature and examine nature videos' ability to induce the awe experience with visually engaging natural environments. Previous research has shown that experiencing awe can elicit positive mental health outcomes and that nature can be a catalyst for awe experiences (Anderson et al., 2020; Joye & Bolderdijk, 2015). By focusing on nature videos, this study seeks to further the research on what types of natural environments can induce awe and examine the potential for nature videos as a medium to experience those environments, thereby examining potential positive mental health outcomes resulting from this exposure.

To experience awe, one must experience two constructs simultaneously: accommodation and vastness. Previous research has shown that various natural environments require both accommodation and vastness, thus they can elicit awe (Keltner & Haidt, 2003; Piff et al., 2015). Specifically, mountains, forests, and bodies of water have been used in previous awe literature and have been shown to effectively induce feelings of awe (DeMares & Krycka, 1998; Ebersole, 1972; Ryback & Yaw, 1976; Vogler, 2012). Therefore, it is predicted that nature videos depicting vast mountains, serene forests, and expansive water bodies will induce awe.

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No extant literature specifically examines the mediation of nature videos' effects on stress, hope, and motivation for social connectedness through awe. Recent studies have looked into how awe affects our mental well-being. For instance, research has shown that experiencing awe can lower stress levels (Stellar et al., 2015), boost positive emotions such as hope (Rudd et al., 2012), and improve social connections (Piff et al., 2015). These findings lay the groundwork for understanding how awe can play a role in our psychological functioning. These studies provide a foundation for understanding awe's potential as a mediator in psychological processes.

By focusing on how awe induced by nature videos mediates these specific mental health outcomes, the current study aims to contribute novel insights into the therapeutic potential of awe-inducing stimuli in digital environments. This approach underscores the innovative aspect of the research, exploring pathways that have been theorized but not empirically tested in the context of nature videos and mental health outcomes.

Testable Hypotheses

1. Participants randomly assigned to the awe condition will self-report significantly greater awe than those assigned to the non-awe condition.
2. Participants randomly assigned to the awe condition will self-report significantly less stress compared to those in the non-awe condition.
 - 2a. Self-reported awe will significantly mediate the relationship between condition and stress, such that greater awe will be associated with less self-reported stress.
3. Participants randomly assigned to the awe condition will self-report significantly more hope compared to those in the non-awe condition.

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3a. Self-reported awe will significantly mediate the relationship between condition and hope, such that greater awe will be associated with more self-reported hope.

4. Participants randomly assigned to the awe condition will self-report significantly more motivation to foster social connectedness compared to those in the non-awe condition.

4a. Self-reported awe will significantly mediate the relationship between condition and motivation to foster social connectedness, such that greater awe will be associated with more motivation to foster social connectedness.

CHAPTER TWO: METHOD

Power Analysis

A power analysis (G*Power, 3.1.9.2; Faul et al., 2009) for the proposed study was calculated using an independent samples *t*-test and an estimated effect size of $d = .5$. The effect size of $d = .5$ was based on previous research validating awe-inducing awe video stimuli compared to neutral stimuli ($d = .57$; Chirico, 2018). The power analysis indicated that to obtain 80% power, and an alpha level of .05 a minimum of 102 participants (51 in each condition) was required. This sample size is consistent with Valdesolo & Graham's (2013) five mediational studies measuring awe and other related constructs ($n = 76-120$).

Participants

To ensure the safety and ethical treatment of participants, approval for this research was obtained from Western Carolina University's Institutional Review Board (IRB #: 2023-03-06-02). A total of $N = 102$ participants were recruited through Prolific, an online platform known for

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its diverse participant pool and rigorous quality controls. Prolific's participants are pre-screened to match study criteria and are compensated for their time. Participants were required to be at least 18 years old and have internet access. Recruitment involved a flyer outlining the study's focus on the potential mental health benefits of nature environments, inviting individuals to partake in a 20-minute session involving nature video viewing and completing questionnaires. The sample included 45 males, 55 females, and 2 participants identifying as other. Ethnic composition was diverse: 5 Asian, 28 Black, 8 Hispanic, 55 White, and 6 from other backgrounds. Demographic details were collected via a questionnaire (see Appendix 1.1). No participants were excluded based on attention checks or participation duration, and no data were modified or removed as all data collected were used in the analyses. The data were examined for multivariate outliers, with none found. Throughout the study, confidentiality was maintained, and no specific ethical issues arose, ensuring all participants' data were securely handled and anonymized.

Table 1

	<i>N</i>	<i>%</i>
Sex	102	
Male	45	44.1
Female	55	53.9
Other	2	2
Race/Ethnicity	102	
Asian	5	4.9
Black	28	25.5
Hispanic	8	7.8
White	55	53.9
Other	8	7.8

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Materials

Nature Video Stimuli

The nature video stimuli selected for this study consists of two YouTube videos: one designed to induce awe and the other serving as a neutral control. The experimental awe group watched a time-lapse video of Yosemite National Park (Jennifer YG, *Yosemite no sound* 2024), while the control group will watch a neutral video of hens walking (Jennifer YG, *Hens Walking* 2024). Participants were randomly assigned to one of the two groups (experimental: awe-inducing Yosemite nature video or control: neutral video of hens walking); each video was viewed for four minutes.

Yosemite Nature Video

The Yosemite video is a time-lapse video, created using the Canon 5D Mark II with various Canon L and Zeiss CP.2 lenses, showcases landmark scenes of Yosemite, including El Capitan, Half Dome, and the cascading Yosemite Falls. Elements contained in these landmarks are known to evoke feelings of vastness and require accommodation, which are essential for the experience of awe (Keltner & Haidt, 2003). Dynamic movement is captured with high-definition quality that is enhanced by motion-controlled dolly shots, aimed at immersing viewers in the natural beauty and evoking a sense of presence.

Neutral Hens Walking Video

This video clip depicted free-range chickens being released from their coop in the morning and roaming freely around a farm, pecking and feeding on corn feed. Captured with an iPhone, it portrays chickens on a free-range farm in South Carolina. This video was selected as

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the neutral stimulus because it lacked the vastness and immersive qualities typically associated with awe-inducing experiences yet was still “nature”. Adapted from previous research by Chirico (2017), who identified hens walking as a neutral stimulus, this video aligns closely with their findings. Therefore, the current study aimed to replicate as closely as possible the stimuli used in Chirico's research.

Design

An experimental research method was employed to answer the research questions. Specifically, this online research study was a randomized controlled trial (RCT) with a between subjects, single-blind, post-test experimental design.

Procedure

Participants enrolled in the study through Prolific, an online platform known for its diverse participant pool and rigorous quality controls. Prolific's participants are pre-screened to match study criteria and are compensated for their time. Once participants entered the study online, they were presented with an informed consent document. Participants were instructed to read the document, which contained information about the study, the researchers, the compensation, possible risks and benefits, and intended use of data.

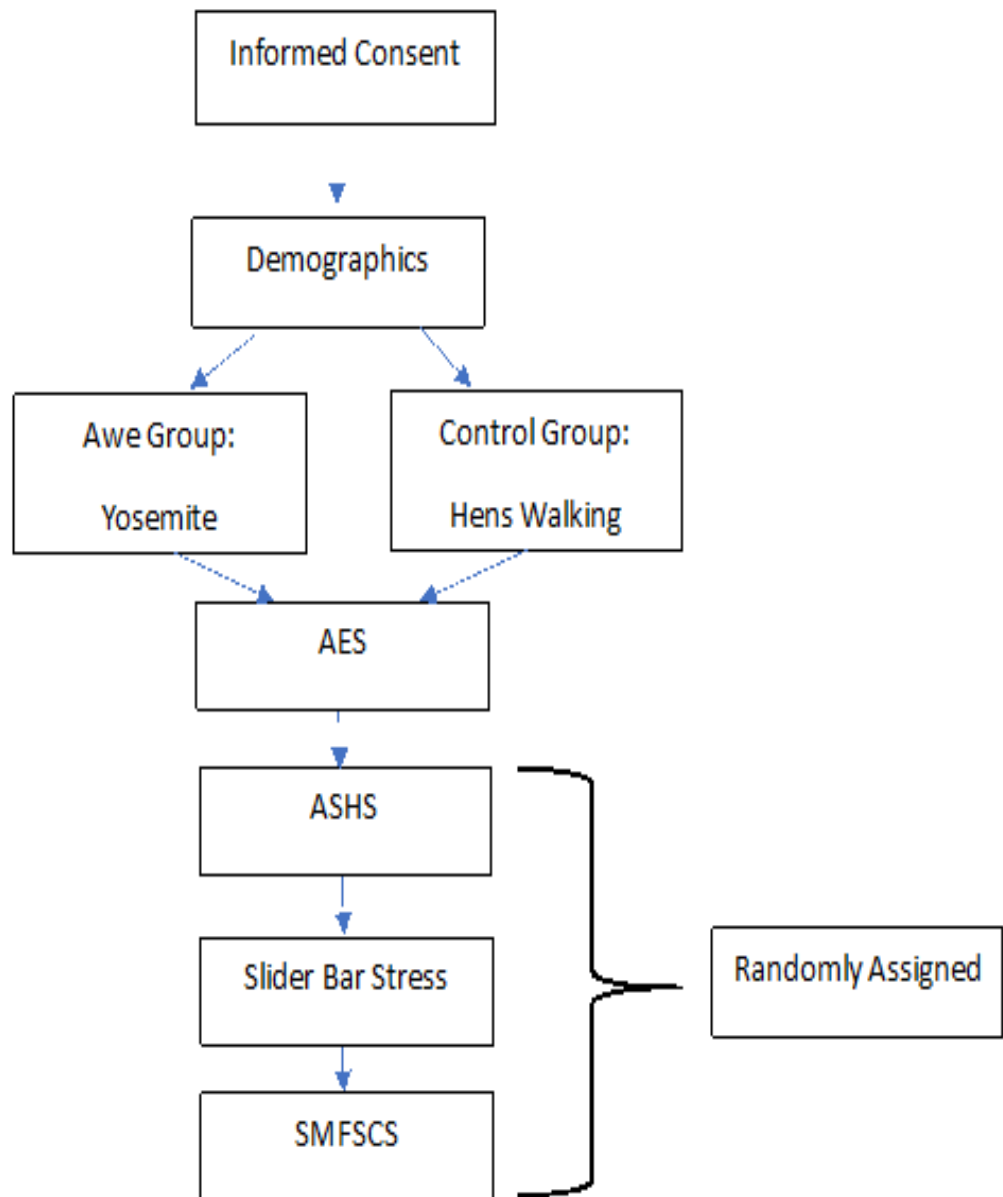
Once participants had read the informed consent, they were required to confirm their consent to participate in the study, affirm their fluency in English, and verify they were at least 18 years old. Those who consented were directed to complete an online demographics questionnaire (Appendix 1.1). Participants who declined to participate had the online study terminated.

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Next, participants were informed they would watch a 4-minute video and subsequently respond to questions from four questionnaires. They advanced to the following online page, where they were randomly assigned to either an awe-inspiring video or a non-awe-inspiring video without knowledge of the video conditions. Once the appropriate video concluded, participants were prompted on the same page to confirm if they had watched it entirely, selecting either "Yes" or "No." Following this confirmation, participants completed the Awe Experience Scale (AES; Appendix 1.2), a 30-item questionnaire gauging their agreement with provided statements. Subsequently, participants completed three additional questionnaires in a randomized sequence: the State Motivation to Foster Social Connections Scale (Appendix 1.3), a 10-item survey assessing participant agreement with statements; the Adult State Hope Scale (ASHS; Appendix 1.4), a 6-item questionnaire where participants rated the accuracy of statements; and the Stress Slider Bar scale (Appendix 1.5), a visual analog scale requiring participants to position a slider along a bar to indicate their perceived stress level, recorded as a numerical value. A flowchart of the experimental procedure online is represented in Figure 1.

Figure 1

Flowchart of Experimental Procedure Online



CHAPTER THREE: MEASURES

Demographics Questionnaire

Participants completed a demographic questionnaire. The demographic information collected included gender identity, age, and ethnicity (See Appendix 1.1).

Awe Experience Scale (AES)

Participants completed the Awe Experience Scale (Yaden et al., 2018). This scale measures an individual's experience of awe based on six factors: perception of vastness, need for accommodation, alterations in time, self-diminishment, connectedness, and physical sensations. It consists of 30 items and uses a 7-point Likert response format. The statements, "I experienced a sense of oneness with all things" and "I perceived vastness" are representative of the types of statements on this scale. The 7 points range from 1 (strongly disagree) to 7 (strongly agree), with a neutral stance at 4. Responses reflect the extent to which the participant feels the statement is accurate for themselves (See Appendix 1.2; Yaden et al., 2018).

Motivation to Foster Social Connections Scale

Participants will complete the State Motivation to Foster Social Connections Scale (Bernstein et al., 2019). This scale measures an individual's motivation to interact with others either through new connections or previously held connections. It consists of 10 items and uses a 7-point Likert response format. The statements, "Right now, I would like to meet new people" and "Right now, I'd like to be around people I know" are representative of the types of statements on this scale. The 7 points range from 1 (strongly disagree) to 7 (strongly agree), with

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a neutral stance at 4. Responses reflect the extent to which the participant feels the statement is accurate for themselves (See Appendix 1.3; Bernstein et al., 2019).

Adult State Hope Scale

Participants will complete the Adult State Hope Scale (ASHS; Snyder et al., 1996). The ASHS contains 6 items and uses an 8-point Likert response format. The statements, “If I should find myself in a jam, I could think of many ways to get out of it” and “I can think of many ways to reach my current goals” are representative of the types of statements on this scale. The 8 points range from 1 (definitely false) to 7 (definitely true). Responses reflect the extent to which the participant feels the statement is accurate for themselves (See Appendix 1.4).

Slider Bar Stress Scale

Participants completed the Slider Bar Stress Scale, a visual analog scale (Crichton, 2001). This scale utilizes a virtual slider bar, presented via Qualtrics, on which participants indicated their level of stress. Participants will be instructed to move the slider along the bar to indicate their perceived level of stress. The position of the slider were recorded as a numerical value, representing the participant's self-reported stress level. The leftmost position of the slider represents no stress, while moving towards the right indicates increasing levels of stress. Participants received the prompt, "When considering your current level of stress, defined as how uncontrollable, unpredictable, and overloaded you find your life to be, please indicate your current level of stress by adjusting the slider below." (See Appendix 1.5)

CHAPTER FOUR: RESULTS

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Previous research indicates that the experience of awe can elicit positive mental health outcomes, and nature serves as a catalyst for awe experiences (DeMares & Krycka, 1998; Ebersole, 1972; Ryback & Yaw, 1976; Vogler, 2012). The presentation of awe-inducing videos, such as those showcasing natural wonders like Yosemite, may evoke a sense of awe comparable to real-life nature experiences. The current study randomly assigned participants to watch either an awe-inducing video of Yosemite (experimental) or a video of hens walking (control) to examine the effect of awe on participants' self-reported social connectedness, stress, and hope.

Preliminary Analyses and Assumption Testing

Data analyses were conducted using SPSS version 29, and the PROCESS macro (Hayes, 2022). A total of N=102 participants completed the study and were included in data analyses. The data were examined for multivariate outliers. No data was modified or removed. Approximately half of the participants were White and women (see Table 1). Chronbach's alpha coefficients computed for each of the self-report scales indicated that awe ($\alpha = .963$), motivation to foster social connection ($\alpha = .942$), and hope ($\alpha = .872$) were reliably assessed in the current sample (Tavakol & Dennick, 2011). Descriptive statistics were computed to examine the central tendency, variability, and distributions of each of the variables of interest (see Table 2 & 3). Each of the scales approximated a normal distribution. Further, the assumptions of linear regression were examined, including linearity, multicollinearity, independence and normality of residuals, as well as homoscedasticity. All assumptions were satisfied as determined by plots, Durbin Watson statistics, and variance inflation factors. The mediational models reported in the following section utilized the Preacher-Hayes method with 5,000 bootstrapped samples and bias-corrected 95% CI to test for indirect effects (Hayes, 2009; Hayes & Scharkow, 2013).

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Table 2

Descriptive Statistics for Control Group

	<i>Mean</i>	<i>Std. Dev.</i>	<i>Skewness</i>	<i>Kurtosis</i>
Awe	2.780	1.100	0.319	0.292
Time	4.096	1.540	-0.509	-0.448
Self	2.573	1.206	0.594	0.167
Vast	2.352	1.261	0.988	0.553
Connect	2.798	1.455	0.326	-0.744
Physical	2.082	1.182	1.356	2.458
Hope	5.583	1.438	-0.671	0.790
Social	4.563	1.600	-0.629	-0.179
Stress	5.755	2.800	-0.393	-0.862

Table 3

Descriptive Statistics for Experimental Group

	<i>Mean</i>	<i>Std. Dev.</i>	<i>Skewness</i>	<i>Kurtosis</i>
Awe	4.171	1.294	-0.254	0.328
Time	4.771	1.170	-0.184	-0.561
Self	3.702	1.385	-0.190	-0.831
Vast	4.714	1.557	-0.867	0.304
Connect	4.277	1.666	-0.406	-0.669
Physical	3.389	1.707	0.282	-0.761
Hope	5.128	1.484	-0.254	0.328
Social	4.311	1.510	-0.330	-0.220
Stress	5.021	2.279	-0.027	-0.762

Inferential Statistics

To test Hypothesis 1, an independent sample *t*-test was conducted to examine whether participants exposed to the awe-inducing video of Yosemite reported more awe than those in the control condition. Results indicated that participants randomly assigned to the Yosemite video condition reported significantly greater awe ($M = 4.171$, $SD = 1.294$) than those in the control

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condition ($M = 2.780$, $SD = 1.100$), $t(99) = -5.836$, $p < .001$. The effect size of condition on self-reported awe was large ($d = -1.164$). This finding suggests that nature videos, such as the one depicting Yosemite, can be effective in inducing awe.

To test Hypothesis 2, an independent sample t -test was conducted to examine whether self-reported stress differed based on random assignment to the video conditions. Inconsistent with Hypothesis 2, results indicated that participants randomly assigned to the Yosemite video condition reported similar stress ($M = 5.021$, $SD = 2.279$) to those in the control condition ($M = 5.755$, $SD = 2.800$), $t(98) = 1.425$, $p = .157$.

To test Hypothesis 2a, a mediational model was conducted to examine whether self-reported awe significantly mediated the relationship between condition and stress. Inconsistent with Hypothesis 2a, and consistent with results from Hypothesis 2, there was no significant direct effect of condition on stress, $b = -1.002$, $SE = 0.595$, $p = .096$. Further, results indicated that the direct effect of awe on stress was not significant, $b = 0.1953$, $SE = 0.217$, $p = .370$, and the indirect effect of condition on stress was not significant, $b = 0.269$, $SE = 0.264$, 95% CI [-0.237, 0.829].

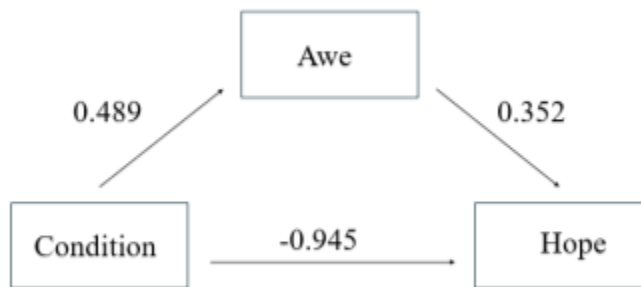
To test Hypothesis 3, an independent sample t -test was conducted to examine whether self-reported hope differed based on random assignment to the video conditions. Inconsistent with Hypothesis 3, results indicated that participants randomly assigned to the Yosemite video condition reported similar hope ($M = 5.128$, $SD = 1.484$) to those in the control condition ($M = 5.583$, $SD = 1.438$), $t(99) = 1.565$, $p = .121$. Although not significant, the trends in mean differences are opposite to Hypothesis 3; the control condition reported greater hope.

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To test Hypothesis 3a, a mediational model was conducted to examine whether self-reported awe significantly mediated the relationship between condition and hope. Results indicated there was a significant direct effect of condition, $b = -0.945$, $SE = 0.325$, $p = .005$, and awe, $b = 0.352$, $SE = 0.118$, $p = .004$, on hope. Being randomly assigned to the control condition, as well as reporting greater awe, was associated with greater hope. Further, results indicated that the indirect effect of condition on hope was significant, $b = 0.489$, $SE = 0.234$, 95% CI [0.097, 1.003], such that when taking awe into account, the Yosemite video condition was predictive of greater hope. These results suggest that the increase in awe was critical for the positive effect of the Yosemite video condition on hope. As such, Hypothesis 3a was partially supported (see Figure 2).

Figure 2

Awe Mediating the Relationship Between Condition and Hope



Note. Condition is coded such that 0 = control, 1 = experimental.

To test Hypothesis 4, an independent sample t-test was conducted to examine whether self-reported motivation to foster social connection differed based on random assignment to the conditions. Inconsistent with Hypothesis 4, results indicated that participants randomly assigned

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to the nature condition reported similar motivation ($M = 4.311$, $SD = 1.506$) to those in the control condition ($M = 4.563$, $SD = 1.601$), $t(99) = 0.812$, $p = .419$.

To test Hypothesis 4a, a mediational model was conducted to examine whether self-reported awe significantly mediated the relationship between condition and motivation to foster social connection. Inconsistent with Hypothesis 4a, and consistent with results from Hypothesis 4, there was no significant direct effect of condition on motivation to foster social connection, $b = -0.539$, $SE = 0.357$, $p = .135$. Further, results indicated that the direct effect of awe on motivation was not significant, $b = 0.206$, $SE = 0.130$, $p = .116$, and the indirect effect of condition on motivation was not significant $b = 0.287$, $SE = 0.201$, 95% $CI[-0.076, 0.701]$.

Discussion

Since the 1800s, integrating nature into mental health care, exemplified by initiatives like tent therapy at Friends Hospital in Philadelphia and the Manhattan State Hospital, has been recognized for its capacity to enhance both physical and mental well-being. Early practitioners and researchers have documented its effectiveness in promoting positive outcomes among patients. Research on outdoor therapy lacks specificity and control, yet an increasing body of evidence supports the impact of nature aesthetics on positive mental health outcomes, suggesting that simply being in, seeing, and experiencing nature can significantly influence program success. Scholars like Gillis (1996) and Ulrich (1981) highlight the pivotal role of visual perception in nature experiences, supported by studies in nature aesthetics, psychological therapy, and experiential therapy, with visual representations of nature reported to alleviate stress, enhance positive emotions, and restore attention (Bratman, 2012; Honeyman, 1990; Ulrich, 1979; Ulrich, 1981); however, the specific nature elements leading to these outcomes

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remain to be precisely determined with robust evidence. Previous research has identified various natural elements like water, wild animals, sunsets, and forests as potential catalysts for positive mental health outcomes, suggesting an experiential process wherein participants encounter transcendent moments, characterized by positive affect and awe, which play a significant role in mental well-being. Recent studies propose awe as a pivotal experiential factor, delineating its features as vastness and accommodation, which may provide insights for controlled induction of awe to comprehend its effects on mental health outcomes. Recent studies demonstrate the potential of nature videos in inducing awe and promoting mental well-being by immersing viewers in expansive natural scenes, reducing stress (van der Wal et al., 2020; Ulrich et al., 1991), enhancing social connectedness (Aknin et al., 2018; Bai et al., 2017), and fostering hopefulness (Anderson et al., 2020; Joye & Bolderdijk, 2015), suggesting their efficacy as a practical intervention tool, especially for those with limited access to natural environments (Kjellgren & Buhrkall, 2010; White et al., 2014).

The current study examined whether an awe-inspiring video could successfully induce nature-based awe and whether that awe would be associated with other positive outcomes including reductions in stress, as well as increases in hope, and motivation to foster social connections. Consistent with Hypothesis 1, a nature-based awe-inspiring video was associated with significantly greater awe than a home-based video environment. Inconsistent with Hypothesis 2 and 2a, condition was not significantly directly or indirectly associated with self-reported differences in stress. Nevertheless, mean differences in stress between conditions were trending in the right direction, suggesting that a larger sample size may be required to fully power the analysis and detect a smaller effect than hypothesized.

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Inconsistent with Hypothesis 3, hope did not significantly differ based on random assignment to condition, and self-reported means suggested that results trended in the opposite direction as hypothesized. Similarly, results from the mediational analysis indicated that, contrary to Hypothesis 3a, when testing the direct effect of condition on hope, exposure to the nature-based awe-inspiring video condition was associated with significantly less hope than that of the control condition. However, the direct effect of awe on hope was significant, indicating that as awe increased, hope also increased.

Further, the relationship between condition and hope was significantly mediated by awe, such that awe was a significant predictor of greater hope. These findings partially support Hypothesis 3a and provide evidence that awe is a critical mediator of increased hope following exposure to the awe-inspiring video. The mediation observed in the study aligns with existing psychological theories that highlight the transformative effect of awe on emotional states such as hope. Previous research states that awe experiences increase positive emotions, which in turn can foster a sense of hopefulness (Keltner & Haidt, 2003). In this study, participants assigned to the awe-inspiring Yosemite video reported significantly higher levels of awe, which mediated the relationship between video condition and hope. This suggests that the emotional impact of awe played a crucial role in enhancing participants' feelings of hopefulness. Additionally, the experimental design ensured random assignment to conditions, which controlled for potential confounding variables and strengthened the validity of the findings. Therefore, the findings support the hypothesis that experiencing awe can enhance hope, providing valuable insights into the mechanisms underlying emotional responses to awe-inspiring stimuli.

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Inconsistent with Hypothesis 4, motivation to foster social connection did not significantly differ based on random assignment to condition. Similarly, inconsistent with Hypothesis 4a, there were no significant direct or indirect effects of condition on motivation to foster social connection.

Inducing Awe through Nature Videos

This study's findings affirm that awe, a profound psychological state, can be successfully induced through nature videos. This discovery is significant, given the mounting evidence that links awe to a range of positive mental health outcomes. Historically, the induction of awe has been primarily associated with direct encounters with vast natural landscapes or extraordinary events. However, this study demonstrates that even through the medium of videos, individuals can experience awe, which broadens the accessibility of awe-inducing experiences to those who may not have the means or ability to engage directly with such environments.

Previous research touts awe as an elicitor of overall well-being in multiple domains (Stellar et al., 2017; Shiota et al., 2007; Piff et al., 2015). Thus, the ability to induce awe via videos assuredly expands the reach of these benefits. The use of nature videos to induce awe can address a notable accessibility gap in mental health interventions. Not everyone can travel to awe-inspiring locations or engage in nature-based activities due to physical, financial, or logistical constraints. Virtual nature experiences can serve as an adjunct to traditional therapies, providing a readily accessible option to enhance mental health. This aligns with findings from Kjellgren and Buhrkall (2010), who showed that virtual nature experiences could evoke similar restorative effects as physical nature experiences. Consequently, incorporating nature videos into clinical practices or therapeutic environments could democratize the experience of awe, making its benefits available to a wider population.

The Role of Awe in Increased Hope

The current study also explored the mediating role of awe in the relationship between the nature video condition and hope. The results indicated a significant direct effect of both condition and awe on hope. Participants exposed to the Yosemite video, who reported higher levels of awe, also exhibited greater levels of hope. This supports the hypothesis that awe mediates the relationship between nature exposure and hope, suggesting that the awe experience itself is critical in fostering hope.

Hope plays a significant role in psychological resilience and overall mental health. It involves belief in the possibility of a positive outcome and fosters a motivation to pursue psychological well-being. Previous research posits hope as a catalyst for successful mental health treatments (Snyder et al., 1991). For example, hope can counteract pervasive feelings of hopelessness and foster a pathway to recovery in depressive patients (Anderson et al., 2018; Slezackova, 2017). Therefore, the ability of nature videos to enhance hope through awe induction has important clinical implications. By integrating awe-inducing nature videos into therapeutic protocols, clinicians can provide a valuable tool to enhance clients' hope. This is especially relevant for populations who are physically restricted or those experiencing mental health issues like depression and anxiety, where building hope is a critical component of treatment. For example, patients in inpatient facilities, individuals in urban settings with limited access to nature, and those with mobility issues could benefit greatly from such interventions (Chirico et al., 2018; Yang et al., 2018).

Non-significant Results

While this study underscores the ability of videos to induce awe and highlights its potential benefits, it's important to address the variability in the intensity of awe and its impact on our findings. Previous research indicates that the intensity of awe can differ significantly depending on the nature of the stimulus. Experiences that evoke profound feelings of vastness and necessitate cognitive accommodation tend to produce stronger awe (Keltner & Haidt, 2003; Chirico et al., 2017). This variability might explain some of our non-significant results.

In the current study, while participants in the Yosemite video condition reported a significant increase in awe compared to the control, this did not consistently translate into statistically significant improvements across all measured outcomes. For instance, hypotheses related to social connectedness and stress reduction (Hypotheses 2, 2a, 4, and 4a) did not achieve significant results. Specifically, the data did not show a substantial difference in reported stress levels or motivation to foster social connections between participants exposed to the awe-inducing Yosemite video and those in the control condition. These findings suggest that while awe was successfully induced, its intensity might not have been sufficient to drive the anticipated effects on all aspects of mental health. The literature supports this, as more immersive and engaging awe experiences typically yield stronger emotional and psychological responses (Shiota et al., 2007; Danvers & Shiota, 2017). Additionally, individual differences in baseline mood, personal experiences with nature, and sensitivity to visual stimuli could have influenced how participants responded to the videos.

Limitations

It is theorized that the aforementioned level of immersion of video stimuli might have influenced the emotional responses and the level of awe experienced by participants. Prior research suggests that immersive environments like virtual reality (VR) can evoke more intense emotional responses and a stronger sense of presence, which amplifies the experience of awe (Chirico et al., 2017; Chirico et al., 2018). VR's ability to create a more lifelike and engaging simulation of natural settings has been found to effectively induce awe and bolster its psychological impacts (Diemer et al., 2015; Chirico et al., 2016). Therefore, the reliance on conventional video in this study may have constrained the intensity of awe felt by participants, potentially affecting the study's findings.

Additional limitations warrant consideration. Firstly, the relatively small sample size may have limited our ability to detect smaller effects with reliability. Secondly, the generalizability of the study may be limited despite our efforts to recruit a diverse group of participants. Thirdly, self-reported data are inherently prone to biases, which can affect the accuracy of participants' responses. Furthermore, the use of single-item measures for the stress construct may have compromised the robustness and precision of these assessments.

Future Directions

A significant limitation of our study lies in the use of traditional two-dimensional video stimuli, which may not fully capture the immersive quality and sensory richness of real-life nature experiences, potentially affecting the intensity of awe reported by participants. Virtual Reality (VR), as proposed by Chirico et al. (2016), presents a promising alternative for inducing awe at stronger intensities by leveraging sensory stimuli to create a heightened sense of presence.

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For instance, Felnhofer et al. (2015) demonstrated VR's efficacy in eliciting various emotions through immersive virtual environments, while DeKort et al. (2006) highlighted VR's ability to enhance the feeling of "being there." Supporting this, Chirico et al. (2017) found that VR environments induced significantly higher levels of awe and perceived vastness compared to two-dimensional settings. Future research should explore VR's potential to more effectively induce awe, offering a richer experience than conventional videos and providing deeper insights into the psychological impacts of awe (Chirico et al., 2016; Riva et al., 2016). Moving forward, incorporating VR technology in experimental designs can advance our understanding of awe induction and its therapeutic applications, addressing the limitations identified in this study.

Future researchers should also consider conducting similar studies on populations that are confined by their environments or affected by specific mental health disorders, such as depression, as addressed in this paper. This approach would not only broaden the applicability of findings but also explore how awe induction through video stimuli can be effectively utilized in therapeutic contexts for these populations. Additionally, efforts should focus on increasing sample sizes to enhance statistical power and employing validated measures to ensure accurate assessments of emotional responses and psychological outcomes related to awe experiences induced by video stimuli. Addressing these aspects will contribute significantly to advancing our knowledge in this area and its practical implications for mental health interventions.

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Appendices

1. Appendix of Measures

1.1 Demographics

1. What is your age in years?

2. What is your sex? Male Female other

3. What is your ethnic identification?

Asian Black Hispanic Native American White Other

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1.2 The Awe Experience Scale

Yaden, D., Kaufman, S., Hyde, E., Chirico, A., Gaggioli, A., Wei Zhang, J., & Keltner, D.

(2018): The development of the Awe Experience Scale (AWE-S): A multifactorial measure for a complex emotion, *The Journal of Positive Psychology, 14*(4), 474-488.

<https://doi.org/10.1080/17439760.2018.1484940>

Please read the following statements and place an “x” in the box that most accurately represents your agreement with the statement.

	1 Strong ly Agree	2 Moderate ly Agree	3 Somewh at disagree	4 Neutr al	5 Somewh at Agree	6 Moderate ly Agree	7 Strong ly Agree
I sensed things momentarily slow down							
I experienced a reduced sense of self							
I had chills							
I experienced a sense of oneness with all things							
I felt that I was in the presence of something grand							
I felt that my sense of self was diminished.							

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I noticed time slowing							
I had the sense of being connected to everything							
I felt small compared to everything else							
I perceived vastness							
I felt challenged to understand the experience							
I felt my sense of self shrink							
I felt closely connected to humanity							
I gasped							
I felt my sense of self become somehow smaller							
I had a sense of complete connectedness							
I struggled to take in all that I							

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was experiencing at once							
I felt my eyes widen							
I experienced something greater than myself							
I found it hard to comprehend the experience in full							
I perceived something that was much larger than me							
I felt my sense of time change							
I felt my jaw drop							
I felt challenged to mentally process what I was experiencing							
I had the sense that moment was lasting longer than usual							
I felt in the presence of greatness							

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I felt a sense of communion with all living things							
I had goosebumps							
I experienced the passage of time differently							
I tried to understand the magnitude of what I was experiencing							

For researcher purposes only

Total _____

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1.3 Motivation to Foster Social Connections Scale

Bernstein, M., Claypool, H., Nadzan, M., Schuepfer, Benfield, J., & Nutt, R. (2017).

Validating the state motivation to foster connectedness scale. *The Journal of Social Psychology*, 159(6), 709-724.

State Motivation to Foster Social Connections Scale

Please read the following statements and rate the extent to which you agree or disagree with those statements with regard to how you are feeling right now. Use the following scale:

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

1. Right now, I would like to meet new people.
2. Right now, I'd like to be around friends.
3. Right now, I would like to talk with and get to know an unfamiliar person.
4. Right now, I would like to be close with friends, family, and significant others.
5. Right now, forming new relationships is very important to me.
6. Right now, I'd like to be around people I know.
7. Right now, I would like to form new friendships/relationships.
8. Right now, being close with my friends, family, and significant others is important to me.
9. Right now, meeting new people and finding out about them is something I am interested in doing.
10. Right now, I'd rather be with my friends and family than alone.

MOTIVATION TO FOSTER SOCIAL CONNECTION: NEW Contacts - Items 1, 3, 5, 7, 9

MOTIVATION TO FOSTER SOCIAL CONNECTION: EXISTING Contacts - Items 2, 4, 6, 8, 10

1.4 Adult State Hope Scale

2. Snyder, C. R. (1996). The Adult Hope Scale. *Journal of Personality and Social Psychology*, 70(2), 321-335. <https://doi.org/10.1037/0022-3514.70.2.321>

Read each item carefully. Using the scale shown below, please select the number that best describes *how you think about yourself right now* and put that number in the blank before each sentence. Please take a few moments to focus on yourself and what is going on in *your life at this moment*. Once you have this “here and now” set, go ahead and answer each item according to the following scale:

1	2	3	4	5	6	7	8
Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True

- _____ 1. If I should find myself in a jam, I could think of many ways to get out of it
- _____ 2. At the present time, I am energetically pursuing my goals
- _____ 3. There are lots of ways around any problem that I am facing now
- _____ 4. Right now, I see myself as being pretty successful
- _____ 5. I can think of many ways to reach my current goals
- _____ 6. At this time, I am meeting the goals that I have set for myself

Scoring information

Pathways subscale score: Add items 1, 3, and 5. Scores on this subscale can range from 3 to 24, with higher scores indicating higher levels of pathways thinking.

Agency subscale score: Add items 2, 4, and 6. Scores on this subscale can range from 3 to 24, with higher scores indicating higher levels of agency thinking.

Total hope score: Add the pathways and Agency subscales together. Scores can range from 6 to 48, with higher scores representing higher hope levels.

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1.5 State Stress Measure

Crichton, N. (2001). Visual analogue scale (VAS). *J Clin Nurs*, 10(5), 706-6.

Stress

When considering your stress, defined as how uncontrollable, unpredictable, and overloaded you find your life to be, please rate your current stress by sliding the bar on the appropriate area of the line below.

A horizontal line with numerical markers from 0 to 10. Below the line, a vertical bar is positioned at the 0 mark. To the left of the 0 mark, the text reads: "0 = No Stress; 10 = Extreme Stress".