Feeling ‘Awe’some!

The impact of awe, produced by exposure to nature and interpersonal elicitors, on prosocial behaviour

University of Twente

Bryan Cajas | August 2020

Feeling 'Awe'some!

The impact of awe, produced by exposure to nature and interpersonal elicitors, on prosocial behaviour

Master Thesis

Name: Bryan Cajas
Student Number: S1896237
Study: M-COM Marketing Communication
Supervisor: Dr. T.J.L. van Rompay
Second Assessor: Prof. dr. M. D.T de Jong

UNIVERSITY OF TWENTE.

Acknowledgements

First, I would like to thank my thesis supervisor, Dr. Thomas van Rompay who guided me throughout this research process. Dr. van Rompay encouraged this work to be my personal project by giving me a lot of freedom while reassuring me for any questions and concerns. I also would like to thank Dr. De Jong, who gave constructive feedback and advice, which helped in the finalization of my research project.

Thank you to my parents for trusting me and making my studies possible!

A special thank you to my 56 family, for inspiring and supporting me during this journey. But also, to all the amazing friends who danced and laughed with me during these academic years. I can just be in *Awe*.

Bryan Cajas

UNIVERSITY OF TWENTE

Abstract

AIM: This study seeks to identify ways to reconnect individuals with each other and their environment. One emotion, in particular, may help people to be more cooperative, generous and connected to others. Such emotion is awe. Therefore, this study attempts to explore the effects of awe induced by nature and interpersonal elicitors on people's prosocial, pro-environmental, and donation behavioural intentions. Small self and proneness to awe are considered as additional variables in the research study.

METHOD: An experimental 2 (level of awe: high vs. low) x 2 (elicitors: nature vs. interpersonal) between-subject design is conducted. Video stimuli were used to manipulate awe and were integrated into an ongoing fictional project from the Sustainable Development Goals. Participants (N=124) were assigned to one of the four experimental conditions and exposed to their respective videos. Afterwards, they filled in a questionnaire assessing their behavioural intentions.

RESULTS: Results showed a significant interaction effect on awe in the level of awe and elicitors. The analyses indicated that presenting high awe nature scenery enhanced awe. The high awe interpersonal scenery also induced awe but not as significant as nature-based awe. Furthermore, participants influenced by the nature elicitors were more likely to feel awe, and in turn, felt significantly small.

CONCLUSION: The study found that certain features of awe had positive effects on the emotion of interest and the small self. Notably, the use of vast and close-ups nature sceneries is awe-inspiring and led people to feel small. The study further provides an understanding of the effectiveness of the interpersonal elicitors of awe. NGO's and brands can benefit from this research since it offers insights into the effects of awe which can be used as a marketing tool for their visual communications.

KEYWORDS: Awe, Emotions, Behavioural intention, Prosocial behaviour, Pro-environmental behaviour, Donation intention, Non-Governmental Organizations.

Table of content

1. Introduction

Modern economic development has significantly contributed to the positive growth of living conditions, but today's society is still affected by diverse challenges and uncertainties (Wang, Mukhopadhyay, & Patrick, 2017; Wittmayer, Schäpke, van Steenbergen, & Omann, 2014). From social inequality, public debt crisis to poverty, these large discrepancies, even within western societies, need to be resolved (Wittmayer et al., 2014). While these issues and the current economic development are still ongoing, there is on the other hand, overconsumption which negatively impacts the environment (Vlek & Steg, 2007; Zhao, Zhang, Xu, Lu, & He, 2018). The problem surrounding environmental degradation has been a major issue for decades and remains the most alarming concern for humanity (Zhao et al., 2018). Many of these problems are mainly caused by human behaviour (Vlek & Steg, 2007).

To address these environmental and societal challenges, political bodies, policymaker and social institutions introduced several measures to decrease and halt such issues (e.g. The Sustainable Development Goals introduced by the United Nations in 2016). However, means to convey messages that can be applied and communicated more effectively remains a necessity (Wang et al., 2017). One way to counteract these societal and environmental challenges could be the identification of means to help individuals connect with each other and their environment, which is the goal of this study.

To date, mass media communications (e.g. promotional campaigns) often used emotions to deliver prosocial messages aiming to inspire behavioural change (Schwartz & Loewenstein, 2017). Emotions have been shown to play an essential role in shaping individuals' judgment and decision processes and are regarded as strong incentives for one's conduct. Stellar et al. (2017) suggests that self-transcendent emotions, in particular, facilitate people to cooperate organize, and show care for others and society overall. One emotion, specifically, can diminish

the importance of the self and encourages attention towards others and has been empirically studied to promote prosocial behaviour (Piff, Dietze, Feinberg, Stancato, & Keltner, 2015; Stellar et al., 2017). Such emotion is awe. Awe may be a part of the answer and could potentially help overcome these societal and environmental problems. Therefore, this research will focus on this unique emotion with prosocial effects, and that inspires people to be successful members of society (Joye & Bolderdijk, 2015; Piff et al., 2015).

Awe is a positive emotional response that arises in the presence of something vast, which challenges an individual mental representation of the world (Keltner & Haidt, 2003). In other words, awe arises when a person encounters something immensely vast (in scope, size, or complexity) that they must adjust their mental schemas to make sense of it. A majority of studies proved that natural scenery often elicits awe (Allen, 2018). Specifically, these nature stimuli are usually presented by vast landscapes and panoramic views of nature which trigger something much more significant from the self (Keltner & Haidt, 2003; Shiota, Keltner, & Mossman, 2007). Moreover, most studies on the prosocial effects of awe were mainly effective with nature-based awe, as confirmed by Bai et al. (2017). Since awe possesses self-transcendent qualities and is defined as a positive emotional experience, it is argued that awe is a driving factor for prosocial behaviour (Joye & Bolderdijk, 2015; Piff et al., 2015). Consequently, awe may be used as an emotion to potentially influence peoples' behaviour to act prosocial towards others and pro-environmental towards nature.

Another important aspect related to awe is the small self effect. It was found that awe is often accompanied by feelings of self-diminishment, the so-called small self (Piff et al., 2015). Awe leads people to feel like their self-concept is less important and in turn, reduces attention on their daily personal concerns. As a result, individuals feel a sense of connectedness as if they are part of a broader community (Stellar et al., 2017). In other words, not only does the emotion

encourage concerns, interests, and other-oriented prosocial behaviour towards others, but it also promotes a collective sense by bringing people together (Zhong & Mitchell, 2010).

Thus far, the main focus in research is directed towards awe-inspiring natural scenery and its behavioural effects, but little is known about the potential effect of other elicitors of awe on prosocial behaviour. Therefore, to fill the current research gap, this study goes beyond the natural aspect by exploring the interpersonal elicitors and its effects. These elicitors are less known in the research literature as confirmed by Chirico et al. (2017) especially, the ones depicted by vast crowds. Additionally, this study researches other facets of prosocial behaviours (i.e. donation to charity and pro-environmental behaviour) to understand the breadth of awe's prosocial effects. Ultimately, it is examined, via the small self, whether inducing diverse awe elicitors (i.e. nature and interpersonal) facilitates engagement with social causes, that share an interest and concern for others and nature. The small self is thus, expected to act as a mediator between awe and the prosocial outcomes.

In summation, the main aim of this study is to quantitatively explore various prosocial behavioural effects of awe induced by two elicitors, nature and interpersonal. Examining such matter would help determine whether different elicitors of awe will display differences or similarities in these behavioural outcomes. To reach these goals, the following research questions have been identified:

RQ1: *To what extent does awe, induced by two different elicitors (i.e. nature, and interpersonal), affect behavioural intentions, namely prosocial, pro-environmental and donation behavioural intentions?*

RQ2: *To what extent do the interpersonal elicitors provoke an awe reaction?*

RQ3: *To what extent are the effects of interpersonal awe comparable to those induced by nature-based awe?*

2. Theoretical Framework

2.1. Research Model

The following model represents the visualization of the research questions, including the independent and dependent variables of this study. On the left of the illustration are the independent variables and on the right are the dependent variables measured in this research study. The variable small self mediates the effects of the independent variables on the outcome variables. Proneness to awe serves as the moderator. This results in a 2x2 design, with high or low awe condition and the type of elicitors, i.e. the depiction of whether nature or interpersonal sceneries. Altogether these form the framework of the research design. See *figure 1* below for the full research design.

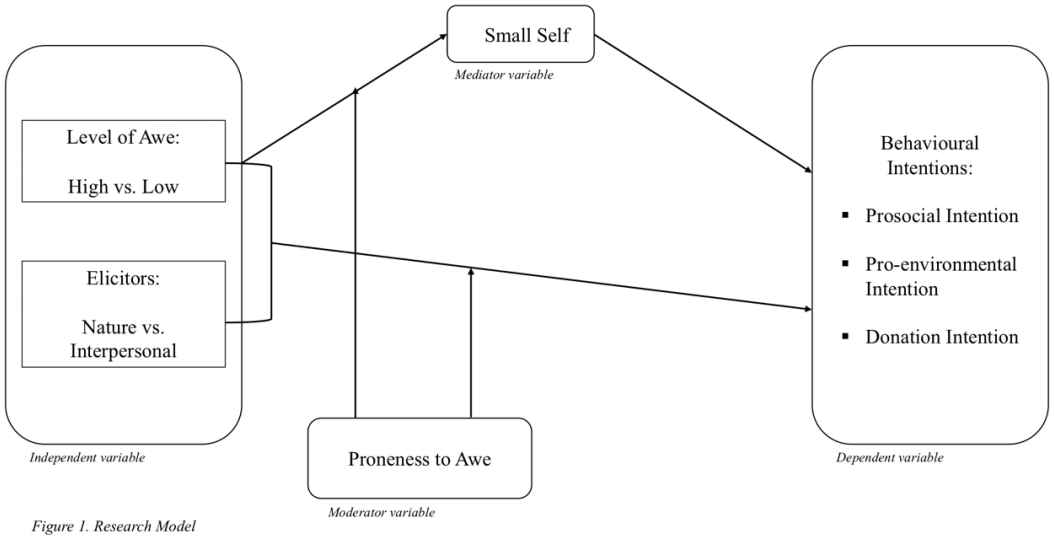


Figure 1. Research Model

2.2. The emotion of Awe

2.2.1. Definition of Awe

The emotion of awe has been explored for centuries in different fields, mainly in philosophical and religious disciplines. Plutchik (1980), who categorized emotions into primary emotions and

combinations of these called dyads, theorized awe as a primary dyad. This means that awe is the result of two primary emotions, specifically fear and surprise. Psychologists like Plutchik took notice of the emotion, but since 2003, the focus on awe in the psychological domain has strongly increased. One particular study by Keltner and Haidt (2003), now considered as a landmark in the field, introduced awe into contemporary research on emotions. In this paper, both psychologists provided a theoretical basis on ways to define, conceptualize, and study awe.

The authors described awe as a complex emotional experience an individual generates when encountered with vast stimuli which then, provokes the individual to update their current mental schemes (Keltner & Haidt, 2003). The emotion of awe is regarded as powerful and complex, leaving an individual completely overwhelmed by the wonders he just witnessed, capable of altering one's perception of the universe and ourselves deeply and suddenly (Quesnel & Riecke, 2018; Saroglou, Buxant, & Tilquin, 2008). Subsequently, changes in a person's mental framework will be made to understand the scope of the situation. To sum, awe is an emotional response when individuals experience powerful and vast stimuli that are beyond their current understanding (Piff et al., 2015; Saroglou et al., 2008). Such awe-inspiring experiences are rare and profound.

2.2.2. Vastness

As stated in the previous section, one of the defining features that form an awe experience is *vastness.* Keltner and Haidt (2003, p. 8) defined it as "to anything that is experienced as being much larger than the self, or the self's ordinary level of experience or frame of reference". In other words, this sense of vastness may refer to a stimulus that is large to any extent. These awe-inducing stimuli may be vast in diverse ways (Keltner & Haidt, 2003; Shiota et al., 2007). For instance, a stimulus can be large in number or size (e.g. the night sky). Alternatively, it can relate to someone's social status because of its level of authority, fame or prestige such as an influential person. These align with Keltner and Haidt (2003) vision on this

central feature of awe. It is precisely argued that the dimension of vastness refers to one being perceptually (e.g. contemplating the Grand Canyon) or conceptually (e.g. a complex theory) confronted by large stimulus (Chirico & Yaden, 2018; Keltner & Haidt, 2003).

2.2.3. Elicitors of Awe

A plethora of potential stimuli can induce awe. Originally, psychologists have not been able to agree, for centuries, on describing situations that provoke such intense emotional reaction (Allen, 2018). That disagreement is partly due to the many existing elicitors, and the emotion's ambiguous function. Among these typical elicitors are beauties of nature, panoramic landscapes, incredible pieces of art but even spiritual and religious experiences or also human accomplishments (Gordon et al., 2017; Saroglou et al., 2008; Shiota et al., 2007). Since many stimuli provoke an awe reaction, this research will only explore two specific elicitors. First, nature elicitors, which are considered as one of the most common awe elicitors, will be examined in this study. Second, the interpersonal elicitors (i.e. depicted by vast crowds) will also be researched as it has not been studied in-depth.

2.2.3.1. Nature Elicitors

The most obvious and extensive category of elicitors of awe is nature (Shiota et al., 2007). Potentially due to its intrinsic vastness. To date, numerous studies have indicated that nature strongly affects people's emotions and emotional states, such as awe (Bai et al., 2017; Ballew & Omoto, 2018). Researchers argued that awe could be stimulated through exposure to gorgeous and vast panoramas of nature sceneries (Saroglou et al., 2008; Shiota et al., 2007; Van Cappellen & Saroglou, 2012). These natural phenomena comprise of grand elements such as the scope, size, and complexity of the object in question (Joye & Bolderdijk, 2015). For this reason, large stimuli such as a mountainous landscape, the night sky, waterfalls or space, will induce awe.

A commonly used method to elicit awe consists of videos depicting vast scenes of natural beauty (Bai et al., 2017; Rudd, Vohs, & Aaker, 2012; Valdesolo & Graham, 2014). This approach suggests that awe-inspiring nature can be induced indirectly. Recently, a virtual reality (VR) study by Chirico, Ferrise, Cordella, and Gaggioli (2018) demonstrated that interacting with scenes featuring high snow mountains, tall trees, and views of the earth caused statistically significantly higher awe-experience compared to a neutral stimulus depicted by a plain green scenery. Another technique to elicit awe is by asking participants to recall experiences in nature (Piff et al., 2015; Shiota et al., 2007). Conversely, awe can be experienced by directly situating subjects in a large natural environment such as in the study from Piff et al. (2015), in which participants stared up at a towering grove of eucalyptus trees. However, as the VR study from Chirico and colleagues (2018) proved, not all types of nature provoke an awe-reaction to the same extent. Accordingly, the current study will present participants with potentially nature-based awe-inspiring content in comparison to low awe-inspiring nature.

2.2.3.2 Interpersonal Elicitors

Keltner and Haidt (2003) identified two prototypical elicitors corresponding to the interpersonal elicitors of awe: a charismatic leader and childbirth. Schurtz et al. (2012) described social awe as one's reaction to a persons' skills, abilities, or talents. Hence, a charismatic leader may be perceived as awe-inspiring due to his authority or his great ability to change people's lives. Alternatively, childbirth can also potentially give rise to awe because of its perception as a surprising and novel event in which a person must alter their views on life (Rudd et al., 2012). In the study from Schurtz et al. (2012) related to the physiological effects of awe, they discovered that the social elicitor (i.e. recall exposure to powerful or superior others) was the most prevalent source of awe correlated with the physical effects of Goosebumps. Similar work by Yang, Hu, Jing, and Nguyen (2018) used the recall task to elicit the emotion by asking participants to write about a famous person. The scholars illustrated the

task with Nelson Mandela, and they noticed that participants in the awe condition increased their ratings on the targeted emotion. Graziosi and Yaden (2019) recently highlighted the gap in the research of interpersonal elicitors. They discovered that triggering the emotion in close interpersonal relationships (i.e. loved ones), led participants to experience awe but still with less intensity than awe of nature. Concurrently, a paper by Shiota, Campos, Keltner, and Hertenstein (2004) argued that awe might be prompted in social contexts such as political demonstrations, concerts, sporting, dance, and artistic events.

Many elicitors and features can induce awe based on the research literature mentioned above. Each stimulus is undoubtedly different from one another based on its content still, they respectively hold perceptual features of vastness essential to induce an awe reaction. Particularly, the sense of vastness is typically the main attribute that makes a stimulus awe-inspiring. The present research, therefore, defines this dimension as a requirement for an awe-inspiring stimulus. Specifically, the awe-inducing stimulus will refer to anything that is physically large in scale (e.g. vast panoramic landscape) and numbers (e.g. vast crowd). However, there has been no in-depth research on interpersonal elicitors represented by vast stimuli of large crowds. If awe is an emotion in response to something vast and beyond current understanding thenceforth, a large crowd giving impressions of vastness may provoke an awe reaction. It is, then, explored whether the interpersonal elicitors will affect the emotion of awe similarly or differently from the nature elicitors.

2.3. Outcomes of Awe Experiences

A few researchers agued the likelihood that awe is part of the most influential self-transforming experiences (Quesnel & Riecke, 2018). Often people who experience awe describe that it increases their well-being (Rudd et al., 2012), gives them sense in their lives and goals to pursue. Also, following that it diminishes interest on the self, it facilitates a greater sense of

connectedness (Yaden, Haidt, Hood, Vago, & Newberg, 2017). Thus, besides being a positive emotional experience, awe holds self-transcendent qualities defined by distinctive characteristics (Yaden et al., 2017). Self-transcendent emotions such as awe turn the individuals' attention towards external stimuli, independent from one's interest, that needs to be acknowledged and valued (Piff et al., 2015; Stellar et al., 2017). Therefore, it has the potential to encourage one to shift its own needs, desires and concerns onto others (Stellar et al., 2017; Yaden et al., 2017). Instead of being self-centred, awe broadens ones' attention and subsequently, enhances awareness towards people (Chirico & Yaden, 2018; Michelle N. Shiota, Thrash, Danvers, & Dombrowski, 2017).

Thus, awe with its distinctive characteristics can facilitate people to take a broad perspective on life by considering the welfare of others and their environment (Yang et al., 2018). For these reasons, the individual is nudged to take an active part in other's well-being and society. In other words, this emotion is recognized as a contributor to prosocial behaviour and a determinant of engagement to social collectives (Keltner & Haidt, 2003; Piff et al., 2015). Based on these findings, only the behavioural effects of awe specific to this research, namely prosocial, pro-environmental, and donation behavioural intentions via the small self, are discussed.

2.3.1. Prosocial Behaviour

Prosocial behaviour is described as "a broad category of acts that are defined by some significant segment of society and/or one's social group as generally beneficial to other people" (Penner, Dovidio, Piliavin, & Schroeder, 2005, p. 2). Donating, volunteering, cooperating, helping, and sharing are considered as prosocial acts. Further engagement in these actions can trigger positive affects and emotions for the individual (Aknin, Van de Vondervoort, & Hamlin, 2018). Prosocial behaviour has been an emerging subject of interest associated with awe in the research literature (Joye & Bolderdijk, 2015; Piff et al., 2015; Prade & Saroglou, 2016; Stellar

et al., 2017). And indeed, various empirical evidence proved this effect in different ways. Joye and Bolderdijk (2015) found that awe-inspiring nature promotes prosocial choices compared to mundane nature. Further, Piff et al. (2015) conducted multiple studies and discovered a statistically significant correlation between experiences of awe and prosocial behaviour. People performed more prosocially by supporting ethical decision-making when they watched awe-inspiring natural scenery. Overall, the authors demonstrated that awe enables helping behaviours even towards strangers. The study by Prade and Saroglou (2016) builds on this research. Across two experiments (video clips and recall), they found that induction of awe-inspiring nature increases people's generous attitudes. In sum, while there is evidence that nature-based awe impacts prosocial outcomes, this study explores whether interpersonal awe also positively influences prosocial outcomes and further discusses them to understand the scope of awe's prosocial effects.

2.3.2. Donation Intention

As stated above, prosocial behaviours can take different forms; donation behaviour is one of them. The act of donating may occur, employing different ways, for instance, in the form of knowledge, belongings, blood, organs, time, or money (Grace & Griffin, 2006). Among these donation behaviours, donation of time and money are the most important ways of prosocial behaviour (Cnaan, Jones, Dickin, & Salomon, 2011; Gino & Mogilner, 2014). Through time, awe proved to expand a persons' time availability, feeling less pressured and therefore, willing to donate their time to help others (Rudd et al., 2012). In the form of money, a study exposed participants to positive and negative nature awe which caused them to donate more money compared to the neutral condition (Guan, Chen, Chen, Liu, & Zha, 2019). According to these studies, awe-inspiring scenery may promote more thoughtful and charitable behaviour. Specifically, the present research highlights the act of donating during a fictional donation collection for a Non-Governmental Organization (NGO).

2.3.3. Pro-environmental Behaviour

A different goal of this study is to determine whether awe affects people's pro-environmental behaviour. As proposed by Milfont, Richter, Sibley, Wilson, and Fischer (2013), pro-environmental behaviour is related to the concept of *environmentalism*. The following is described as the concern for the environment and engagement to actions, behaviours, and attitudes that are environmentally friendly. Therefore, this study investigates the potential influence of awe on pro-environmental behaviour. Although most scholars found that nature-based awe is recurrent and can lead to prosocial behaviours, the link with pro-environmental behaviour is particularly empirically understudied. Only a few experimental studies explored the relationship between awe and pro-environmental behaviour. For instance, a study from Zhao et al. (2018) revealed that the emotion stimulates a person's willingness to change their environmental behaviour in favour of the environment. Consistent with these findings, Yang et al. (2018) found that awe-inducing nature scenery increases connection to nature and further enables the individuals' likelihood to behave pro-environmentally.

Given the preceding discussion on the prosocial nature of awe, one of the purposes of this study is to explore the effect of awe on various prosocial acts. Therefore, the following hypothesis is formulated:

H1: High awe-inspiring scenery will enhance (a) prosocial, (b) donation and (c) pro-environmental behavioural intentions compared to the low awe scenery

Furthermore, all the previous papers mentioned above seemingly offered direct evidence that awe-inspiring nature sceneries promote prosocial acts, which raises the question of whether nature-based awe is the only elicitor affecting prosocial behaviours. This paper thus acknowledges the lack of research regarding the prosocial impact of the interpersonal elicitors

of awe. Because of this unclear effect of awe-inspiring interpersonal scenery on prosocial behaviours, this research seeks to investigate this relationship further.

2.3.4. Mediation Effect: Small Self

Past evidence proved that awe leads to several bodily, cognitive (e.g. perception of time) and emotional (e.g. positive mood) effects (Allen, 2018). Transformative shifts upon psychological effects can also occur like the small self. Accordingly, people exposed to awe experiences are more likely to report self-diminishment in the presence of something much larger, feeling insignificant, and smallness towards the world (Bai et al., 2017; Piff et al., 2015; Shiota et al., 2007). In a study by Campos, Shiota, Keltner, Gonzaga, and Goetz (2013), people described "feeling small relative to environment/others" when narrating an awe experience opposed to other emotions (e.g. gratitude, love). Similarly, Van Elk and colleagues (2016) found that awe affected a person's body size perception while using a pictorial measurement, leading the individual to feel small. Since awe fosters the small self and in turn, reduces selfish behaviours (Stellar et al., 2017), it was found to enable other-oriented behaviour like generosity and increased prosocial actions (Piff et al., 2015). Therefore, the small self mediates the relationship between awe and prosocial behaviour.

Together these findings suggest that the small self fosters one's attachment to nature and others, and subsequently may enhance pro-environmental and prosocial behaviour. Building on that, it is predicted that awe fosters helping behaviours towards others and their environment via the small self. The small self is further used to assess the effectiveness of an awe experience. Therefore, the following hypotheses are formulated:

H2a: High awe-inspiring scenery (opposed to low) will foster a sense of small self

H2b: The effects of awe on prosocial, donation and pro-environmental behavioural intentions are mediated by the small self

2.3.5. Moderation Effect: Proneness to Awe

Also called dispositional awe, this concept refers to a person who is more likely to experience awe (Keltner & Haidt, 2003; Shiota et al., 2007). Some researchers reported that specific personality traits (i.e. openness to experience and extraversion) predicted the way people tend to experience awe (Michelle N Shiota, Keltner, & John, 2006; Silvia, Fayn, Nusbaum, & Beaty, 2015). These scholars found that awe, elicited by music and images of space, was positively correlated with the personality trait, openness to experience. Hence, the more open-minded or extraverted the person was, the more prone the person was to experience the emotion. Furthermore, dispositional awe influences behavioural acts. Piff et al. (2015) confirmed that dispositional awe influences an individuals' level of generosity during economic decision-making games. They found that people who are more prone to awe donated a greater amount of money. Lastly, the study by Shiota et al. (2007) showed that dispositional awe positively impacts a persons' sense of belonging to a bigger group which subsequently caused the persons' altruistic motivation.

Guided by these findings, it is hypothesized that individuals who are prone to awe are less likely to be focused on themselves and subsequently, encouraged to engage in behaviours beneficial for others and their environment. Thus, the following hypothesis is formulated:

H3: The impact of awe on the outcome variables is more pronounced for people who are prone to experiencing awe

3. Method

3.1. Research design

The conducted research is an experimental 2 (High Awe vs. Low Awe) x 2 (Nature vs. Interpersonal) between-subject design to determine the extent to which awe induced by two different types of elicitor influences behavioural intentions (i.e. prosocial, pro-environmental and donation intention). The small self will serve as the mediator and proneness to awe will function as the moderator. Table 3.1 below illustrates the four different experimental conditions created for this study.

Table 3.1: *Overview of the manipulation of the final study*

Conditions		***Level of Awe***	
		High Awe	Low Awe
Elicitors	Nature	Condition 1	Condition 3
	Interpersonal	Condition 2	Condition 4

3.2. Preliminary test

Two preliminary tests were conducted to evaluate the intensity and the specific nature of each video stimulus. The aim was to examine which video of each category of elicitors (i.e. nature and interpersonal) were perceived as the most awe-inspiring to the participants. The results of the pre-tests were used to determine the stimuli for the final experiment. A short questionnaire was created on Qualtrics to test these manipulations. Participants indicated the degree to which they felt anger, disgust, amusement, awe, fear, pride, sadness, joy, fascination, and wonder using single items (1= *Not at all*, 7= *Very much*) while watching the stimuli. This self-report assessment is in line with previous empirical studies on awe (Piff et al., 2015; Valdesolo & Graham, 2014). In *Appendix A*, an overview of means and standard deviation of the assessed emotions for both pre-tests can be found.

For the first pre-test, a sample of 20 randomly selected participants determined the best high awe-inspiring video from each category of elicitor (i.e. nature vs. interpersonal). Comparison of means verified which items scored the highest across all conditions (See Appendix A, Table A.1). Participants rated awe the highest in the nature category for both land (*M*= 5.30, *SD*= 1.86) and water sceneries (*M*= 5.30, *SD*= 1.45). For the interpersonal category, the vast crowd scenery scored slightly more on awe compared to the small crowd scenery (*M*= 3.50, *SD*= 1.76 versus *M*= 3.25, *SD*= 1.86).

A second pre-test (*N*= 20) was conducted to closely investigate the interpersonal elicitors (See Appendix A, Table A.2). The interpersonal elicitors characterized by vast crowd elicited awe (*M*=4.19, *SD*= 1.87) compared to the opposed condition (*M*= 3.59, *SD*= 2.03). Furthermore, informal interviews were conducted to ask participants what elements and features provoked them to feel awe in the videos. They also rated which video of each elicitor was the most awe-inspiring. According to them, the high awe depicting vast nature and crowd stimuli were considered as awe-inspiring compared to the low awe videos.

3.3. Stimulus material

After adjustments and modifications, the final stimuli of the experimental study were created. Four video manipulations combined the level of awe: high vs. low, and the type of elicitors: nature vs. interpersonal, as shown in Table 3.1 above. Subsequently, the content and the clips were different for each condition. Inducing awe via video manipulation was commonly used throughout the literature research. Accordingly, such a method was applied to this study. The different scenes shown in the videos were collected from YouTube and later edited with the use of iMovie. The high awe nature condition consisted mainly of clips and panoramic sequences of large, aerial views of mountains, forests, deserts, plains, canyons, and sunsets. These types of landscapes were chosen based on the research of Keltner and Haidt (2003), who suggested these as the most potent elicitors of awe. Similarly, the high awe interpersonal condition

depicted large, aerial views of crowds and groups of people. Both low awe conditions were characterized by a low sense of vastness as they were not intended to elicit awe. The low awe nature condition represented clips of common natural elements such as flowers, grass, and leaves. Likewise, the low awe interpersonal condition comprised of clips of small-scale crowd scenes and neutral everyday life elements. Each video lasted for around 55 seconds, and the stimuli material were presented via a TV screen to intensify the visual experience. All four video manipulations are visually represented below *(Figure2-5)*.

Figure 2: High Awe x Nature

Figure 3: High Awe x Interpersonal

Figure 4 – Low Awe x Nature

Figure 5 – Low Awe x Interpersonal

3.5. Participants

Experiences of awe are not limited to a certain target group. Nevertheless, since the study is situated at the University of Twente, the recruitment of participants on-site was regarded as favourable. As the room for the experiment was booked for two weeks, the respondents were gathered through convenience due to time constraints. The final sample of this research is *N*= 124 after deleting one invalid response due to an incomplete questionnaire. 59 respondents were

females (48.0%), and 64 males (52%.0%), the average age of the participants was 23.14 years (*SD* = 2.58) with a minimum age of 18 and a maximum age of 30. Thirty-four different nationalities were involved in this research. No statistically significant age differences across all conditions $F(1, 119)= 0.26$, $p= 0.61$) was found. Therefore, the participants were equally distributed across all four conditions regarding their age. Most participants were of German (N= 45, 36.3%) nationality, followed by Dutch (N= 22, 17.9%). In line with the sampling method, an overview of the respondents' demographics per conditions is illustrated in table 3.4 below.

Table 3.2: *Demography per conditions*

Demography Conditions	**High Awe x Nature N= 31**	**High Awe x Interpersonal N= 31**	**Low Awe x Nature N= 31**	**Low Awe x Interpersonal N= 31**
Gender, N (%)				
Female	16 (27,1%)	15 (25,4%)	15 (25,4%)	13 (22%)
Male	15 (23,4%)	15 (23,4%)	16 (25,0%)	18 (28,1%)
Other	-	1 (100,0%)	-	-
Age, M (SD)	23,13 (2,56)	23 (2,93)	23,53 (2,52)	22,90 (2,34)
Education, N (%)				
Lower than Bachelor	9 (22,5%)	12 (30,0%)	5 (12,5%)	14 (35,0%)
Bachelor's degree	19 (26,8%)	16 (22,5%)	21 (29,6%)	15 (21,1%)
Master's degree	3 (23,1%)	3 (23,1%)	5 (38,5%)	2 (15,4%)
Nationalities, N (%)				
Germany	11 (24,4%)	12 (26,7%)	10 (22,2%)	12 (26,7%)
Netherlands	9 (40,9%)	5 (22,7%)	3 (13,6%)	5 (22,7%)
Spain	2 (28,6%)	-	1 (14,3%)	4 (57,1%)
Italy	2 (33,3%)	-	4 (66,7%)	-
Others	7 (15,9%)	14 (31,8%)	13 (29,5%)	10 (22,7%)

3.6. Procedure

The experimental study was conducted in November 2019. The research sessions were held in offices at the library of the University of Twente. The online questionnaire was administrated

through the survey software Qualtrics. The full questionnaire can be found in *Appendix B*. Upon arrival, all participants were asked to sit facing a screen. They were given the informed consent form and asked if they agreed to take part in the experiment.

Before the start of the study, instructions were administered verbally. It was explained to participants that they were about to watch a video used for an ongoing project from the Sustainable Development Goals (SDGs) and that they had to answer questions related to what they have watched. The subjects were not aware yet that it was a fictional video. Only when the first viewing of the video was completed, respondents could proceed in the study. A brief description of the goals and missions of the SDGs was described along with the possible ways of achieving these goals. Participants were then required to imagine a situation in which they were asked to contribute to the SDGs through a door-to-door collection context (i.e. how much money they are likely to donate). Then, respondents evaluate items about their donation intention.

Next, the participants were requested to answer questions related to their pro-environmental and prosocial behavioural intentions. To verify the effectiveness of the manipulations and to assess awe, they answered the degree to which they felt ten affective states including awe while watching the video along with the assessment of their small self. The questionnaire continued with a final scenario describing the relationship between the SDGs and Non-Governmental Organizations (NGOs) to address the respondents' attitudes towards these organizations. At the end of the study, the subjects were thanked for their participation and informed about the fictitious character used in the video and the survey.

3.7. Measurements

This section discusses the different dependent variables, along with their measurement scales. The complete questionnaire can be found in *Appendix B.* Also, a complete table with the final Cronbach's alpha and list of items for each construct can be found in *Appendix C.*

3.7.1. Prosocial Behaviour

Kasser and Ryan (1993) created a scale to measure people's aspirations for making the world a better place through one's actions. This scale was used to assess the respondents' prosocial behavioural intention. A 7-point Likert scale ranging from 1 (*Strongly disagree*) to 7 (*strongly agree*) is used to measure the six items. A test of internal consistency found that by deleting one item (*I would not hesitate to help others when they ask for it*). The rest of the scale consisted of five items and was found reliable with a value of α= 0.82.

3.7.2. Donation Intention

It was first measured how much money participants would be likely to spend to the SDGs as a one-time donation. Seven predefined amounts (up to 25€,50€, 75€, 100€, 150€, 300€, or more) were proposed. Further, to measure donation intention, the scale developed by Armitage and Conner (2006) was used. Participants were asked to indicate the extent to which they felt inclined to donate to the SDGs, based on a 5-point Likert scale measurement ranging from 1 (*Definitely not*) to 5 (*Definitely*). Additionally, two items from Rudd et al. (2012) assessed the likelihood and willingness to volunteer time and to donate money to a charity. An analysis showed the internal reliability of the scale with a high alpha value (α= 0.81).

3.7.3. Pro-environmental Behaviour

Fielding and Head (2012) developed a scale to assess people's likelihood to perform pro-environmental behaviour such as *buy local organic food, recycle things*. Two items were added about the willingness to make personal sacrifices to protect the environment from Zhao et al., 2018. All items were measured from 0 (*Not at all likely*) to 10 (*Extremely likely*) and were adjusted to match this study's context. The scale was found to be reliable (α= 0.82).

3.7.4. Small Self

This measure is used to assess the awe manipulations. Specifically, the small self is used to indicate people's sense of vastness towards the self and a sense of self-diminishment. Both are components of the small self established by Piff et al. (2015). The first dimension of the small self is composed of three items, and they were formulated to match this study's context. To measure self-diminishment, respondents rated their agreement with the item *While watching the video, I felt small or insignificant*". However, the latter had to be removed from the final reliability test, and subsequently, the scale was found to be reliable (α= 0.87). Further, a pictorial measurement, retrieved from the study of Bai et al. (2017) was added to complete the measurement of the small self. Specifically, respondents were presented with seven pictures and selected which of these bests represented how big or small they felt towards the world. The seven pictures were created to match a 7-point interval scale ranging from 1 (*Extremely small*) to 7 (Extremely *large*). This can be found in the complete survey displayed in *Appendix B*.

3.7.5. Proneness to Awe

The moderator for this study assessed the likelihood of experiencing awe. This inventory consisted of a 6-item awe subscale from the Dispositional position Emotional Scale and was adapted from the study of Michelle N Shiota et al. (2006). The scale was measured on a seven-point Likert Scale anchored by strongly disagree to strongly agree. The Cronbach's α was 0.7

3.7.6. Awe (Manipulation Check)

An additional measurement was added to check the effectiveness of the manipulations. Specifically, participants rated to what extent they felt ten different emotions, including awe while watching the video. Awe was assessed with a single item Likert self-report measure (1= *Not at all*, 7= *Very much*) among nine distinct emotions: anger, disgust, amusement, fear, pride, sadness, joy, fascination, and wonder.

4. Results

This research investigates the effect of the level of awe (high vs. low) induced by two types of elicitors (nature vs. interpersonal) on peoples' behavioural intentions, being prosocial, pro-environmental, and donation intentions. To determine the relevance of the research questions and to test the formulated hypotheses, various statistical tests were conducted with the software IBM SPSS 23. The following section gives an overview of the conducted analyses and their results.

4.1. Awe (Manipulation Check)

Similar to the pre-test, the effectiveness of the four manipulations were empirically checked in the main study. This manipulation check was used to investigate whether the manipulations elicited the targeted emotion (e.g. the awe-inspiring conditions as awe, the low-awe inspiring conditions as more neutral). But also, to explore whether the interpersonal elicitors evoke an awe reaction. Therefore, participants reported the degree to which they felt ten emotions, including awe, while watching the video using single items. A 2 (level of awe: high vs. low) X 2 (elicitors: nature vs. interpersonal) analysis of variance (ANOVA) with awe as the dependent variable was performed to test the differences between the four manipulations (See table 4.1 for the Univariate results).

Table 4.1: *Overview of the Univariate Results*

	F	**P**	**Partial η2**
Level of Awe	4.60	.03	.04
Elicitors	61.13	.00	.34
Level of Awe*Elicitors	3.97	.05	.03

The results showed a significant main effect of the level of awe itself on awe, $F(1, 120) = 4.60$, $p = 0.03$, $\eta 2p = 0.04$. As expected, the high awe conditions produced greater feelings of awe ($M = 3.58$, $SD = 1.32$) compared to the low awe conditions ($M = 3.13$, $SD = 1.55$). These findings confirm that participants in the high awe conditions experienced more awe than did participants in the low awe conditions. Furthermore, a significant effect of the elicitors on awe was found, $F(1, 120) = 61.13$, $p < 0.001$, $\eta 2p = 0.34$. Thus, the nature conditions scored higher on awe ($M = 4.18$, $SD = 1.11$) compared to the interpersonal conditions ($M = 2.53$, $SD = 1.29$).

Table 4.2: *Mean scores and standard deviations of the manipulations on awe*

Conditions		***Level of Awe***			
		High Awe		Low Awe	
		M	SD	M	SD
Elicitors	Nature	4.19	1.17	4.16	1.07
	Interpersonal	2.97	1.20	2.10	1.25

Finally, there was a significant interaction effect, $F(1, 120) = 3.97$, $p = 0.05$, $\eta 2p = 0.03$, indicating that there is a statistically significant difference in the effect of the manipulations on awe. While looking at the comparison of means, the awe ratings were almost similar for the high awe ($M = 4.19$, $SD = 1.17$) and low awe ($M = 4.16$, $SD = 1.07$) in the nature conditions. Therefore, no significant difference was found within the nature conditions. However, a clear distinction can be found for the interpersonal elicitors and level of awe. The mean for the high awe interpersonal was significantly higher ($M = 2.97$, $SD = 1.20$) compared to the low-awe interpersonal ($M = 2.10$, $SD = 1.25$). Table 4.2 shows the results of the interaction effect and is furthermore visualized in *Figure 6.* Based on these findings, the high awe-inspiring nature proved to be the best combination to elicit awe. *Appendix D* presents an overview of the results of the manipulation check with the ten distinct emotions, including awe.

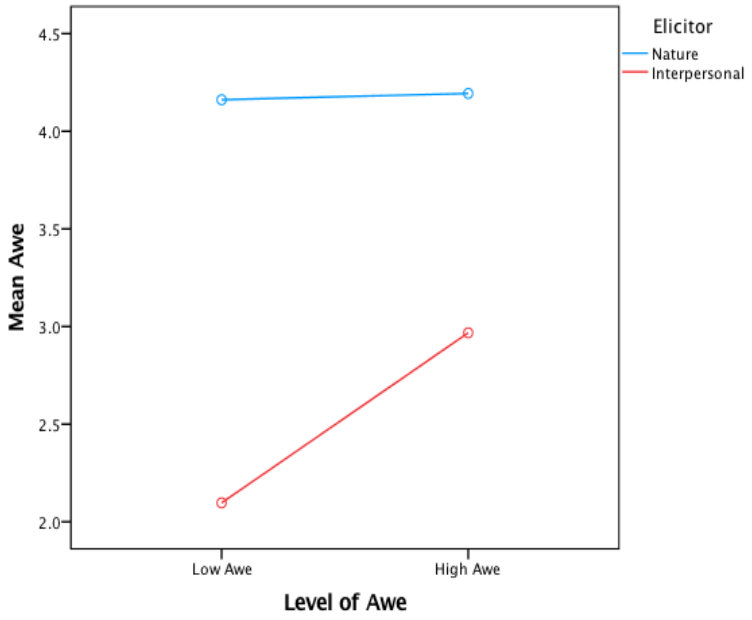


Figure 6: Profile plot of the interaction effect between level of awe and elicitors on awe

4.2. Behavioural Intentions

An initial one-way multivariate analysis of variance (MANOVA) was conducted to determine the main and interaction effects of the independent variables (i.e. level of awe vs. elicitors) on the dependent variables (i.e. prosocial, pro-environmental and donation intentions). The findings revealed no significant interaction effect of the conditions on the combined dependent variables, Wilks' λ= .99, *F(*3, 118)= 0.19, *p*= 0.90. Neither main effect was found for the level of awe, Wilks' λ= .99, *F(*3, 118)= 0.03, *p*= 0.99, nor significant effect of elicitors, Wilks' λ= .99, *F(*3, 118)= 0.25 , *p*= .85. See Table 4.3 below for the Multivariate results. Separate ANOVA's were used to further pinpoint the differences among the four conditions combining the level of awe and elicitors.

Table 4.3: *Overview of the multivariate results – Behavioural intentions*

	Λ	**F**	**P**	**Partial η2**
Level of Awe	.99	.03	.99	.00
Elicitors	.99	.25	.85	.00
Level of Awe*Elicitors	.99	.19	.90	.00

4.2.1. Prosocial behavioural intention

To further establish the differences between the conditions on prosocial behavioural intention, a 2 (level of awe: high vs. low) X 2 (elicitors: nature vs. interpersonal) analysis of variance (ANOVA) with prosocial behaviour as the dependent variable was conducted. The results showed that the main effect of level of awe, $F(1, 120)= 0.04$, $p= 0.83$, and elicitors, did not reach the significance ($F < 1$, *ns*). Neither did their interaction effect ($F's < 1$, *ns*). Table 4.4 below shows the main effects of the independent variables on prosocial behaviour. Therefore, Hypothesis H1a can be rejected.

4.2.2. Donation behavioural intention

To identify whether participants in the high awe-inspiring conditions report higher donation behavioural intention, a 2 (level of awe: high vs. low) X 2 (elicitors: nature vs. interpersonal) analysis of variance with donation intention as the dependent variable was conducted. The results showed no significant main effect of the level of awe, $F(1, 120)= .00$, $p= 0.92$. Neither the main effect of elicitors nor their interaction effect did reach significance (all $F's < 1$, ns). Table 4.4 below shows the main effects of the independent variables on donation intention. Therefore, Hypothesis H1b regarding the positive effect of awe-inspiring stimuli on donation behavioural intention can be refuted.

4.2.3. Pro-environmental behavioural intention

To determine whether participants in the high-awe inspiring conditions report higher pro-environmental behavioural intention, another similar ANOVA with level of awe (high vs. low) and elicitors (nature vs. interpersonal) was performed. The analyses showed that the main effect of the level of awe, $F (1, 120)= .00$, $p= 0.95$, elicitors and their interaction did not reach significance (all $F's < 1$, *ns*). (See Table 4.4). Hypothesis H1c can also be rejected.

Table 4.4: *Overview of the univariate results – Behavioural intentions*

	Prosocial intention		Donation intention		Pro-environmental intention	
	F	***p***	**F**	***p***	**F**	***p***
Level of Awe	.04	.83	.00	.92	.00	.95
Elicitors	.00	.94	.69	.40	.01	.92
Level of Awe*Elicitors	.19	.66	.21	.64	.04	.83

4.3. Small self: mediation effect

A 2 (level of awe: high vs. low) X 2 (elicitors: nature vs. interpersonal) analysis of variance with the small self (perceived self-size measurement) as the dependent variable was performed. Due to Levene's test revealing that the homogeneity of variances was violated ($p < .05$), p values were derived using Welch's test. The test revealed a statistically significant main effect of elicitors on the small self, *Welch's* $F(1, 112.44) = 21.18$, $p < .001$. Participants felt significantly small when nature scenery was displayed ($M = 5.24$, $SD = 1.19$) compared to the interpersonal scenery ($M = 4.07$, $SD = 1.60$). However, it was hypothesized that the high awe conditions would foster a sense of small self compared to the low awe conditions. The findings showed that the main effect of the level of awe did not indicate any significant effect, *Welch's* $F(1, 121.80) = .00$, $p = .98$. Neither did their interaction effect ($F < 1$, *ns*). See Table 4.5 below for the comparison of the means between the conditions.

Table 4.5: *Mean scores and standard deviations of participants perceived self-size (self-report measurement [a]) across conditions*

	High Awe		Low Awe		Total	
	Mean	SD	Mean	SD	Mean	SD
Nature	5.26	1.16	5.21	1.24	5.24	1.19
Interpersonal	4.04	1.68	4.09	1.54	4.07	1.60
Total	4.65	1.56	4.65	1.50		

a) 7-point Likert scale (1= Strongly disagree, 7= strongly agree)

Similarly, another ANOVA analysis was performed with the small self (pictorial measurement) as the dependent variable. The analyses showed a significant main effect of the level of awe on the pictorial measurement of the small self, $F(1, 120)= 5.54$, $p= 0.02$, $\eta 2p= 0.04$. Surprisingly, the low awe conditions increased a sense of small self ($M= 2.84$, $SD= 1.40$) compared to the high awe conditions ($M= 3.45$, $SD= 1.60$). Furthermore, a significant main effect of the elicitors was found, $F(1, 120)= 11.19$, $p= 0.001$, $\eta 2p= 0.08$, indicating that the nature conditions lead people to feel small ($M= 2.71$, $SD= 1.48$) compared to the interpersonal conditions ($M= 3.58$, $SD= 1.45$). No significant interaction effect was found on the pictorial measurement of the small self (F's < 1, *ns*). Table 4.6 below shows an overview of the means scores across all conditions. Ultimately, Hypothesis H2a can be rejected.

Table 4.6: *Mean scores and standard deviations of participants perceived self-size (pictorial measurement [a]) across conditions*

	High Awe		**Low Awe**		**Total**	
	Mean	SD	Mean	Sd	Mean	SD
Nature	3.00	1.53	2.42	1.41	2.71	1.49
Interpersonal	3.90	1.55	3.26	1.29	3.58	1.45
Total	3.45	1.60	2.84	1.40		

a) 7-point Likert scale (1= Extremely Small, 7= Extremely Large)

Finally, the small self was added as a covariate in a MANCOVA analysis to indicate its possible moderation effect of the relationship between the dependent and independent variables. The results revealed no significant effect and change in the effects of either the level of awe (Wilks' $\lambda= 0.86$, $F(3,117)= 0.03$, $p= 0.99$), elicitors (Wilks' $\lambda= 0.98$, $F(3, 117)= 0.42$, $p= 0.73$), and interaction (Wilks' $\lambda= 0.99$, $F(3, 117)= 0.17$, $p= 0.91$). Thus, there is further no indication of mediation of the small self between the independent and outcome variables. Hypothesis H2b can be rejected.

4.4. Proneness to Awe: moderation effect

Lastly, a MANCOVA analysis was performed to indicate the possible moderating effect of proneness to awe. The latter is added as a covariate in a subsequent MANOVA analysis. Against expectations, the effect of the level of awe (Wilks' $\lambda = 0.99$, $F(3, 117) = 0.35$, $p = 0.78$), elicitors (Wilks' $\lambda = 0.99$, $F(3, 117) = 0.26$, $p = 0.85$) showed no significant change and effects on the outcome variables after controlling for the effect of proneness to awe. This finding shows that proneness to awe does not moderate the relationship between the independent variables and the outcome variables. Therefore, Hypothesis H3 can be rejected.

5. Discussion

The present study aimed to extend previous research findings regarding the behavioural effects of awe. More precisely, it was examined to what extent awe evoked by two different elicitors (i.e. nature and interpersonal) affects the individuals' prosocial, pro-environmental, and donation behavioural intentions. Also explored was whether the interpersonal elicitors depicted by vast crowds caused an awe reaction. The following section discusses the main findings of the study. Then, the practical implications of these results will be outlined. Finally, the limitations and prospects for future research are discussed.

5.1. Main findings and Theoretical Implications

5.1.1. Awe (Manipulation Check)

Firstly, the results of the manipulation check suggest that the awe-inspiring conditions were effective in that they significantly elicited awe compared to the low awe conditions. Both high awe conditions, regardless of the elicitors, were perceived as awe-inspiring. In line with previous research, presenting a high awe-inspiring nature scenery resulted in higher ratings on awe. Conversely, presenting a low awe interpersonal scenery was perceived as the least awe-inspiring among all conditions.

However, the most surprising result from the manipulation check was the main effect of elicitors. Nature was the most effective in the awe-mood ratings, while interpersonal was least potent. Therefore, conditions depicting only nature scenery were perceived as awe-inspiring. Nonetheless, this result validates nature's role as a prototypical elicitor of awe (Shiota et al., 2007). This further shows the importance of nature, which was formerly identified, in previous studies, in which participants regarded this type of experience as an awe-inspiring

elicitor (Valdesolo & Graham, 2014). The effect of the nature elicitors means, however, that there were no differences in awe reactions between the low awe nature condition (characterized by close-ups and mundane nature) and high awe nature condition (characterized by large panoramic clips of nature). Such result suggests, therefore, that not only large, spectacular views of impressive mountains, canyons, and sunsets play a unique role in eliciting awe as described by Keltner and Haidt (2003), but even close-up nature scenery could produce similar effects. This outcome reflects the study of Ballew and Omoto (2018), who demonstrated that even brief and mundane nature interactions can foster awe and other positive emotions. Another possible reason for the emotional benefits of nature can be provided by attention restoration theory (ART) (R. Kaplan & Kaplan, 1989; S. Kaplan, 1995). ART holds that nature leads to cognitive benefits such as replenishment of attentional capacity and restoration of mental resources but also explains nature's positive affect. Specifically, certain features of the natural environments hold restorative benefits such as its softly fascinating mechanism, also referred to as soft fascination. While these natural features pleasantly attract attention, they do not require much cognitive effort and voluntary attention (Herzog, Black, Fountaine, & Knotts, 1997). Importantly, these physical elements in the natural landscape are inherently fascinating due to their complexity and richness in detail (Herzog et al., 1997; S. Kaplan, 1995). Some theoretical insights (e.g. Ballew and Omoto, 2018) confirm the idea that the fascinating features of nature generate positive psychological and emotional states, which explains why this cognition-based theory can also apply to emotions. In the context of this study, such soft fascination elements may be identified by the sceneries of grass swaying, flowers, gardens, or parks. Awe may, thus, share elements from ART's soft fascination component. Ultimately, the fascinating characteristics of these sceneries within the low awe nature condition possibly caused an awe-inspiring reaction.

The study, further, addressed the research gap in other awe-inspiring elicitors specifically, the interpersonal elicitors. While the interpersonal conditions had less awe-inspiring effects than nature, the finding still suggests that the awe-inspiring interpersonal condition worked, and this could be due to the *need for accommodation* (NFA). NFA is the second feature that forms an awe experience besides vastness and is defined by Chirico et al. (2018, p. 2) as "the urge to adjust mental frames according to new incoming information". It further involves elements of novelty and surprise, as cited by Chirico and Yaden (2018, p. 223). In other terms, people experiencing awe have difficulties in grasping and fully understanding a situation because it may be confusing and/or surprising, which then leads people to transform their view on things (Bonner & Friedman, 2011; Keltner & Haidt, 2003). In the case of this study, the vast crowd sceneries may have conveyed feelings of confusion since participants may be challenged to grasp what was going on in the video. As a result, they created a bewildering experience that could lead to this need for accommodation. Alternatively, these awe-inducing stimuli may have defied an individuals' mental representation. Hence, the spectacular vast crowds could cause accommodation due to its perceptual vastness, i.e. greater than anything one has experienced before. Likewise, an individual who is entirely unfamiliar with such situations must make sense of it by adjusting his mental schemas. In light of this new experience, the individual will then alter its view on things.

An alternative explanation may be that the participants were negatively overwhelmed by the vast crowd sceneries. Based on Keltner and Haidt's (2003) approach, vastness can be interpreted as threatening or powerful, which explains why fear can relate to awe. Such phenomenon can also be explained by the "flavours" of awe proposed by Keltner and Haidt (2003). Besides vastness and accommodation, the authors identified five other dimensions that may be considered during an awe-inspiring experience. Threat-based awe is one of them and occurs when one feels in danger which leads to an awe-inspiring experience accompanied by

feelings of fear. Prior evidence suggests that awe can further encompass negative valence. For instance, the work of Gordon et al. (2017) indicated that priming participants with stimuli characterized by perceptual vastness, yet threatening by nature (e.g. tornadoes), elicited an awe-inspiring experience distinct from the typically studied positive facet of awe. Thus, the clips of vast and open spaces filled with people may be stress-inducing or threatening, evoking feelings of fear, and to a certain extent, agoraphobia.

A final explanation regarding the effect of interpersonal elicitors on awe may be related to the sense of connectedness depicted in the stimuli. Research suggests that an increased sense of connectedness often accompanies awe since it reduces the self (Allen, 2018). As previously mentioned, awe can lead people to feel part of something much bigger, like they are part of a group (Saroglou et al., 2008). In the study, these sceneries may express the concept that many people with different lives and ideas come together creating a sense of unity and sense of belonging. It is therefore plausible that such an experience might encourage awe.

5.1.2 The Small Self

The small self items also assessed the effectiveness of the awe manipulations. These items produced somehow surprising results, which offers little support for the hypotheses. The analysis showed that the positive effect on the small self was only effective in the low awe conditions, leading participants to perceive their self-size smaller when visualizing close-ups sceneries. Thus, the perceptual vastness of the sceneries did not foster the small self. Similarly, Piff et al. (2015) found that participants who watched a stimulus devoid of perceptual vastness, i.e. drop of water falling in slow motion, reported a sense of small self. In the context of this study, other features might have consequently provoked the small self like the accommodation component, which implies that the sceneries were surprising or confusing to the participants. It could also be that the stimuli were conceptually vast in that they were rich in detail and complexity, which provoked an individual's smallness. Furthermore, Bonner and Friedman

(2011) argued that awe could also occur from the ordinary if one is open to its potential, which may explain why the small self arises in the low awe conditions. For these reasons, it enables the individual to be aware of the relative sense of their smallness within the universe.

Another result found in the small self analysis is that the nature elicitors yielded a significant effect on the small self. Participants reported feeling small when they are being presented by nature sceneries compared to interpersonal ones. Again, this result supports nature as a prototypical awe elicitor (Shiota et al., 2007), but it can also be explained by the softly fascinating features perceived in the natural landscape (R. Kaplan & Kaplan, 1989). Ultimately, the beauty of nature might have triggered this self-diminishment since it was previously found to affect the individuals' small self (Cohen, Gruber, & Keltner, 2010).

This study was, furthermore, unable to replicate the mediating effect of the small self on the relationship between awe and prosocial behaviour found in previous research (Piff et al., 2015). This might be due to the items used for the construct of interest. Piff et al. (2015) observed that the effect of awe on prosocial behaviour is driven primarily by the self-diminishing aspect of the small self instead of vastness. They further explained that this aspect measures one's self-concept as less important and decreases subsequently selfish behaviours. While this study assessed both facets of the small self (i.e. self-diminishment and vastness), the items measuring self-diminishment had to be removed from the final reliability test. As a result, no mediation effect of the small self was observed between awe and prosocial outcomes.

5.1.3. Behavioural Intentions

Finally, it was investigated whether awe-inspiring nature elicitors or interpersonal elicitors would promote similar or different effects on the behavioural outcomes. However, the findings do not corroborate with past studies regarding the prosocial effects of awe. The lack of significant results in the prosocial outcomes may be explained by the manipulations used in the study. While the results showed that the awe-inspiring conditions induced the target

emotion, the low awe conditions surprisingly generated the small self. Consequently, participants were possibly not able to distinguish which condition was awe-inspiring. Hence, the manipulations may not have been powerful enough to cause an effect on the prosocial outcomes. This somewhat contradictory result may also be due to the set-up of the experimental study. Specifically, the study introduced the manipulations as an ongoing project from the Sustainable Development Goals (SDGs), which could have potentially primed the participants to already behave prosocially. Moreover, the contents of the manipulations used in this study were subjectively chosen by the researcher. And thus, the clips may have conveyed undesirable constructs aside from awe that go beyond the intention of this study. For instance, the vast scenes of crowds depicted in the interpersonal elicitors may convey a sense of solidarity, which may have affected these prosocial outcomes. Additionally, the beauty perceived in the nature scenery probably influenced participants' prosocial behaviours. Prior work observed that nature promotes prosocial behaviours when they are deemed beautiful, particularly for individuals who are more receptive to the beauty of nature (Zhang, Piff, Iyer, Koleva, & Keltner, 2014).

5.2. Practical Implications

Despite the small number of significant effects found in this study, the findings provide some practical implications. Given that the current experimental study involved a practical setting with fictitious but realistic advertising presented as a Sustainable Development Goals project, these outcomes can be used as an object of interest for professionals across different fields. These findings represent relevant implications for charities and Non-Governmental Organizations (NGOs) as well as for marketers and brands. Considering the importance and the ubiquity of visuals in the advertising field, features of nature awe can be utilized within a visual brand communication for NGOs. For instance, environmental charities can use nature scenery to carry out a message about an issue or to improve the consumer's well-being. Also, features of interpersonal awe can be applied to inspire people and interact with others. For instance, a

brand can use interpersonal scenery to promote a sense of community and perhaps raise awareness related to social issues. Since low awe-inspiring views characterized by close-ups and more ordinary sceneries can provoke the small self, marketing brands and NGOs could further make use of this concept. With the small self, marketers and NGOs may use its features when designing messages for their brand, to encourage an awe-inspiring lifestyle, to shift consumer's focus onto others and communities but also to increase their connection to nature and other people.

5.3. Limitations

5.3.1. Stimulus Material

The main limitation concerns the assessment of the emotion of interest. Measuring awe can be difficult because there is a multitude of factors that could affect it. Each awe-inspiring condition consisted of different awe-inducing scenes which make it difficult to say which elements had the strongest effect to elicit awe. Apart from vastness, other explicit or implicit features in the videos could as well be influential in evoking an awe reaction. Further, Keltner and Haidt (2003) identified five other themes of an awe-inspiring experience: threat, beauty, ability, virtue, and supernatural. However, this research did not take all these aspects into account in creating such an experience. Most of these features (e.g. beauty, NFA) stated above were not included in the research conceptualization. Therefore, it cannot be concluded from the results whether it was the awe-evoking quality (i.e. perceived vastness), the beauty of nature, or the threatening aspect of the interpersonal sceneries, that were responsible for the positive influence on awe. Future studies could explore the different thematic of awe to verify the differences between these two elicitors.

Although the results suggest that the awe-inspiring conditions elicited the targeted emotions, they may not have been distinct or powerful enough to be effective. For example,

both nature conditions did not significantly differ from each other regardless of the level of awe. Thus, it would be interesting to replicate this study by including a control condition. The following would only comprise of a simple questionnaire without a cover story and any visual material. This would help understand the difference between an awe-inspiring experience and a completely neutral condition.

Another limitation within the stimulus material was the limited representation of humanity depicted in the interpersonal conditions. Most of the sequences edited in the videos represented a more westernized society depicted with clips of festivals and protests. Therefore, this could be perceived as not inclusive since it may not inspire a complete sense of humanity. The sample population of the present study is part of different countries from all over the world, making it less relatable for these participants to identify and engage with the video stimuli. Future studies should subsequently focus on highlighting inclusive interpersonal scenes for a diverse sample population.

A final limitation regarding the stimulus material was the length of the manipulations. Each condition lasted 55 seconds before it continuously looped while participants were answering the questionnaire. Therefore, the same stimuli material was exposed to the participants until the end of the experimental study, which may have hindered the experience of awe, distracted the participants from answering the questionnaire or the subjects may have felt bored watching the same video continuously. It would be particularly interesting to find the right intensity and duration to elicit an awe reaction. To the extent, however, that the length of the awe-inducing stimulus would not affect the experience and still hold the transformative aspects of the emotion.

5.3.2. Experimental Setting

The current experimental study exposed participants to stimuli material via a television screen to induce an intense awe reaction; however, this method may have limited the ecological

validity of the study. There is, undoubtedly, a significant difference between awe induced via a television screen as opposed to experiencing awe in person. Silvia et al. (2015) emphasized the difficulties to elicit awe in experimental settings. These issues remain a key challenge for researchers to grasp and reproduce the complex processes that characterize the emotion of awe in a laboratory setting. Further experimental investigations are useful to repeat this study by exposing participants to real-life settings of an awe experience.

5.3.3. Generalization

Another limitation that needs to be addressed is the sample population that is studied. Although the sample was quite diverse in terms of ethnic identity, the majority of the respondents were highly educated people, which was previously found to be a sampling bias (Henrich, Heine, & Norenzayan, 2010). Consequently, this sample group might have influenced the outcomes, and these results are only evident in this part of the population. Future research should include a more demographically representative sample of society.

5.3.4. Physiological measurement

While the findings were mostly based on self-reports, they could have been complemented with other measures. For instance, by adding physiological data, it may help understand patterns within an awe-experience. In one of the experiments from Schurtz et al. (2012), they asked participants to recall a time in which they had felt goose bumps in response to an influential person. The scholars found that awe, in response to such a situation, was positively correlated with goose bumps. Alternatively, it was found that threat-based awe provoked an increased heart rate. Therefore, further research is needed to investigate the physiological effect of awe which can support the psychological outcomes of the emotion.

5.4. Future Research

Firstly, this study mainly focused on vastness without considering the second component, need for accommodation, which together are essential factors in eliciting awe. With regards to the study results, it seems reasonable that this construct could be a key feature. Chirico et al. (2017) assessed NFA with items such as to what extent people "felt confused and bewildered" or "struck by the video". Thus, assessing the respondents' need for accommodation could be interesting to develop a full picture of awe since it can also impact responses. Therefore, additional studies would be needed to explore both core features of awe.

Secondly, this research supposedly manipulated the positive side of awe, but it may be that the interpersonal elicitors encompassed the negatively valenced facets of awe. Focusing on the negative experiences of awe is recommended to investigate whether the effects of negative-based awe on these behavioural outcomes could impact similarly or not from positive experiences of awe.

Thirdly, future work could involve music to extend the emotion of awe since this study primarily focused on the visual stimuli of awe. Keltner and Haidt (2003) established that a diverse range of songs might be comprehended as both vast and accommodating. Some studies identified music as an effect inducing elements of awe (Huron, 2006; Pilgrim, Norris, & Hackathorn, 2017). Thus, it could be interesting to explore the best combination of musical features with visually stimulating material to create a highly engaging experience of awe.

Finally, innovative methods such as virtual reality may be a promising avenue to elicit an intense awe-inspiring experience. This could guarantee a higher degree of ecological validity by giving subjects a sense of being "present". Studies who empirically induced awe with the use of virtual reality only focused on nature sceneries (Chirico et al., 2018; Quesnel & Riecke, 2018). Future studies could also include the interpersonal elicitors and understand their effects.

Regardless, it is evident that more research is needed to explore the phenomenon of awe. While this study identified distinctive features and elements to evoke an awe-inspiring experience. These findings shed light on the degree to which awe can be elicited by vast interpersonal views and surprisingly even by close-ups, everyday life sceneries. Although, such awe experiences were found to be rare; an individual may experience awe daily if they are open to its potential and allow themselves to accept the transformative experiences of awe. Therefore, what was once a positive emotional response to the extraordinary, awe may also be an exceptional response to the mainstream world.

Bibliography

Aknin, L. B., Van de Vondervoort, J. W., & Hamlin, J. K. (2018). Positive feelings reward and promote prosocial behavior. *Current Opinion in Psychology*, 20, 55-59. doi:https://doi.org/10.1016/j.copsyc.2017.08.017

Allen, S. (2018). The science of awe [White paper]. Retrieved February 26, 2019, from Greater Good Science Center at UC Berkeley: https://ggsc.berkeley.edu/images/uploads/GGSC- JTF_White_Paper-Awe_FINAL.pdf

Armitage, C., & Conner, M. (2006). Social Cognitive Determinants of Blood Donation. *Journal of Applied Social Psychology*, 31, 1431-1457. doi:10.1111/j.1559 1816.2001.tb02681.x

Bai, Y., Maruskin, L., Chen, S., M. Gordon, A., Stellar, J., D. McNeil, G., . . . Keltner, D. (2017). Awe, the Diminished Self, and Collective Engagement: Universals and Cultural Variations in the Small Self (Vol. 113*). Journal of Personality and Social Psychology*, 113(2), 185-209. DOI: 10.1037/pspa0000087

Ballew, M. T., & Omoto, A. M. (2018). Absorption: How Nature Experiences Promote Awe and Other Positive Emotions. *Ecopsychology*, 10(1), 26-35. doi:10.1089/eco.2017.0044

Bonner, E. T., & Friedman, H. L. (2011). A Conceptual Clarification of the Experience of Awe: An Interpretative Phenomenological Analysis. *The Humanistic Psychologist*, 39(3), 222-235. doi:10.1080/08873267.2011.593372

Campos, B., Shiota, M. N., Keltner, D., Gonzaga, G. C., & Goetz, J. L. (2013). What is shared, what is different? Core relational themes and expressive displays of eight positive emotions. *Cognition and Emotion*, 27(1), 37-52. doi:10.1080/02699931.2012.683852

Chirico, A., Cipresso, P., Yaden, D., Biassoni, F., Riva, G., & Gaggioli, A. (2017). Effectiveness of Immersive Videos in Inducing Awe: An Experimental Study (Vol. 7).

Chirico, A., Ferrise, F., Cordella, L., & Gaggioli, A. (2018). Designing Awe in Virtual Reality: An Experimental Study. *Frontiers in Psychology*, 8(2351). doi:10.3389/fpsyg.2017.02351

Chirico, A., & Yaden, D. (2018). Awe: A Self-Transcendent and Sometimes Transformative Emotion. *Springer International Publishing*, 221-233. DOI: 10.1007/978-3-319-77619-4_11

Cnaan, R. A., Jones, K., Dickin, A., & Salomon, M. (2011). Nonprofit watchdogs: Do they serve the average donor? Nonprofit Management and Leadership, 21(4), 381-397. doi:10.1002/nml.20032

Cohen, A., Gruber, J., & Keltner, D. (2010). Comparing Spiritual Transformations and Experiences of Profound Beauty (Vol. 2). *Psychology of Religion and Spirituality*, 2(3), 127–135. https://doi.org/10.1037/a0019126

Fielding, K. S., & Head, B. W. (2012). Determinants of young Australians' environmental actions: the role of responsibility attributions, locus of control, knowledge and attitudes. Environmental Education Research, 18(2), 171-186. doi:10.1080/13504622.2011.592936

Gino, F., & Mogilner, C. (2014). Time, money, and morality. *Psychological Science*, 25(2), 414-421.

Gordon, A. M., Stellar, J. E., Anderson, C. L., McNeil, G. D., Loew, D., & Keltner, D. (2017). The dark side of the sublime: Distinguishing a threat-based variant of awe. *Journal of personality and social psychology*, 113(2), 310. https://doi.org/10.1037/pspp0000120.

Grace, D., & Griffin, D. (2006). Exploring conspicuousness in the context of donation behaviour. *International Journal of Nonprofit and Voluntary Sector Marketing*, 11(2), 147-154.

Graziosi, M., & Yaden, D. (2019). Interpersonal awe: Exploring the social domain of awe elicitors. *The Journal of Positive Psychology*, 1-9. doi:10.1080/17439760.2019.1689422

Guan, F., Chen, J., Chen, O., Liu, L., & Zha, Y. (2019). Awe and prosocial tendency. *Current Psychology*. doi:10.1007/s12144-019-00244-7

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, 33(2-3), 61-83. doi:10.1017/S0140525X0999152X

Herzog, T. R., Black, A. M., Fountaine, K. A., & Knotts, D. J. (1997). Reflection and attentional recovery as distinctive benefits of restorative environments. *Journal of Environmental Psychology*, 17(2), 165-170. doi:10.1006/jevp.1997.0051

Huron, D. B. (2006). Sweet anticipation: Music and the psychology of expectation: MIT press.

Joye, Y., & Bolderdijk, J. W. (2015). An exploratory study into the effects of extraordinary nature on emotions, mood, and prosociality. *Frontiers in Psychology*, 5(1577). doi:10.3389/fpsyg.2014.01577

Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*: CUP Archive. New York, NY: Cambridge University Press.

Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology*, 15(3), 169-182. doi:10.1016/0272-4944(95)90001-2

Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of personality and social psychology*, 65(2), 410.

Keltner, D., & Haidt, J. (2003). Approaching awe, a moral, spiritual, and aesthetic emotion. *Cognition and Emotion*, 17(2), 297-314. doi:10.1080/02699930302297

Milfont, T. L., Richter, I., Sibley, C. G., Wilson, M. S., & Fischer, R. (2013). Environmental Consequences of the Desire to Dominate and Be Superior. *Personality and Social Psychology Bulletin*, 39(9), 1127-1138. doi:10.1177/0146167213490805

Penner, L. A., Dovidio, J. F., Piliavin, J. A., & Schroeder, D. A. (2005). Prosocial behavior: Multilevel perspectives. *Annu. Rev. Psychol.,* 56, 365-392. doi: 10.1146/annurev.psych.56.091103.070141

Piff, P. K., Dietze, P., Feinberg, M., Stancato, D. M., & Keltner, D. (2015). Awe, the small self, and prosocial behavior. *Journal of personality and social psychology*, 108(6), 883. doi: 10.1037/pspi0000018

Pilgrim, L., Norris, J. I., & Hackathorn, J. (2017). Music is awesome: Influences of emotion, personality, and preference on experienced awe. *Journal of Consumer Behaviour*, 16(5), 442-451. doi:10.1002/cb.1645

Plutchik, R. (1980). A general psychoevolutionary theory of emotion. *In Theories of emotion* (pp. 3-33): Elsevier.

Prade, C., & Saroglou, V. (2016). Awe's effects on generosity and helping. *The Journal of Positive Psychology*, 11(5), 522-530. doi:10.1080/17439760.2015.1127992

Quesnel, D., & Riecke, B. E. (2018). Are You Awed Yet? How Virtual Reality Gives Us Awe and Goose Bumps. *Frontiers in Psychology*, 9(2158). doi:10.3389/fpsyg.2018.02158

Rudd, M., Vohs, K. D., & Aaker, J. (2012). Awe Expands People's Perception of Time, Alters Decision Making, and Enhances Well-Being. *Psychological Science*, 23(10), 1130-1136. doi:10.1177/0956797612438731

Saroglou, V., Buxant, C., & Tilquin, J. (2008). Positive emotions as leading to religion and spirituality. *The Journal of Positive Psychology*, 3(3), 165-173. doi:10.1080/17439760801998737

Schurtz, D. R., Blincoe, S., Smith, R. H., Powell, C. A. J., Combs, D. J. Y., & Kim, S. H. (2012). Exploring the social aspects of goose bumps and their role in awe and envy. *Motivation and Emotion*, 36(2), 205-217. doi:10.1007/s11031-011-9243-8

Schwartz, D., & Loewenstein, G. (2017). The Chill of the Moment: Emotions and Proenvironmental Behavior. *Journal of Public Policy & Marketing*, 36(2), 255-268. doi:10.1509/jppm.16.132

Shiota, M. N., Keltner, D., Campos, B., & Hertenstein, M. (2004). Positive emotion and the regulation of interpersonal relationships. In P. Phillipot & R. Feldman (Eds.), *Emotion regulation* (pp. 127–156). Mahwah, NJ: Erlbaum.

Shiota, Keltner, D., & Mossman, A. (2007). The nature of awe: Elicitors, appraisals, and effects on self-concept. *Cognition and Emotion*, 21(5), 944-963. doi:10.1080/02699930600923668

Shiota, M. N., Keltner, D., & John, O. P. (2006). Positive emotion dispositions differentially associated with Big Five personality and attachment style. *The Journal of Positive Psychology*, 1(2), 61-71.

Shiota, M. N., Thrash, T. M., Danvers, A., & Dombrowski, J. T. (2017). Transcending the self: Awe, elevation, and inspiration. *Handbook of Positive Emotions*, (c), 362–377.

Silvia, P., Fayn, K., Nusbaum, E., & Beaty, R. (2015). Openness to Experience and Awe in Response to Nature and Music: Personality and Profound Aesthetic Experiences. *Psychology of Aesthetics, Creativity, and the Arts*, 9(4), 376–384. https://doi.org/10.1037/aca0000028

Stellar, J., M. Gordon, A., K. Piff, P., Cordaro, D., L. Anderson, C., Bai, Y., . . . Keltner, D. (2017). Self-Transcendent Emotions and Their Social Functions: Compassion, Gratitude, and Awe Bind Us to Others Through Prosociality. *Emotion Review*, 9, 175407391668455. doi:10.1177/1754073916684557

Valdesolo, P., & Graham, J. (2014). Awe, Uncertainty, and Agency Detection. *Psychological Science*, 25(1), 170-178. doi:10.1177/0956797613501884

Van Cappellen, P., & Saroglou, V. (2012). Awe activates religious and spiritual feelings and behavioral intentions. *Psychology of Religion and Spirituality*, 4(3), 223.

van Elk, M., Karinen, A., Specker, E., Stamkou, E., & Baas, M. (2016). 'Standing in awe': The effects of awe on body perception and the relation with absorption. *Collabra: Psychology*, 2(1). doi:10.1525/collabra.36

Vlek, C., & Steg, L. (2007). Human Behavior and Environmental Sustainability: Problems, Driving Forces, and Research Topics. *Journal of social issues*, 63(1), 1-19. doi: 10.1111/ j.1540- 4560.2007.00493.x

Wang, T., Mukhopadhyay, A., & Patrick, V. M. (2017). Getting consumers to recycle NOW! when and why cuteness appeals influence prosocial and sustainable Behavior. *Journal of Public Policy & Marketing*, 36(2), 269-283.

Wittmayer, J. M., Schäpke, N., van Steenbergen, F., & Omann, I. (2014). Making sense of sustainability transitions locally: how action research contributes to addressing societal challenges. *Critical Policy Studies*, 8(4), 465-485. doi:10.1080/19460171.2014.957336

Yaden, D. B., Haidt, J., Hood, R. W., Vago, D. R., & Newberg, A. B. (2017). The Varieties of Self-Transcendent Experience. *Review of General Psychology*, 21(2), 143-160. doi:10.1037/gpr0000102

Yang, Y., Hu, J., Jing, F., & Nguyen, B. (2018). From awe to ecological behavior: The mediating role of connectedness to nature. *Sustainability*, 10(7), 2477. doi:10.3390/su10072477

Zhang, J. W., Piff, P. K., Iyer, R., Koleva, S., & Keltner, D. (2014). An occasion for unselfing: Beautiful nature leads to prosociality. *Journal of Environmental Psychology*, 37, 61-72. https://doi.org/10.1016/j.jenvp.2013.11.008

Zhao, H., Zhang, H., Xu, Y., Lu, J., & He, W. (2018). Relation Between Awe and Environmentalism: The Role of Social Dominance Orientation. *Frontiers in Psychology,* 9(2367). doi:10.3389/fpsyg.2018.02367

Zhong, J., & Mitchell, V.-W. (2010). A Mechanism Model of the Effect of Hedonic Product Consumption on Well-being. *Journal of Consumer Psychology*, 20, 152-162. doi:10.1016/j.jcps.2010.01.001

Appendix A

Pre-Study Results

Table A.1
Pretest1. Ratings of the four preselected video stimuli (Nature vs. Interpersonal) with Means and standard deviations

	Nature		**Interpersonal**	
	Land (N= 20)	Water (N=20)	Large Crowd (N= 20)	Small Crowd (N= 20)
	M (*SD*)	M (*SD*)	M (*SD*)	M (*SD*)
Anger	1.35 (1.13)	1.34 (0.93)	1.11 (0.30)	1.20 (0.52)
Awe	5.30 (1.86)	5.30 (1.45)	3.50 (1.76)	3.25 (1.86)
Disgust	1.10 (0.30)	1 (0)	1.20 (0.52)	1.42 (0.67)
Amusement	4.30 (1.80)	3.30 (2.13)	4.40 (1.53)	4.90 (1.02)
Fear	1.80 (1.43)	2.50 (2.18)	1.45 (1.35)	1.25 (0.63)
Pride	3.75 (1.99)	3.20 (1.70)	3.65 (2)	3.40 (1.93)
Sadness	1.70 (1.41)	2 (1.74)	1.15 (0.48)	1.35 (0.58)
Joy	5.80 (1.15)	5.55 (1.53)	5.40 (1.35)	5.60 (1.23)
Fascination	6.65 (0.58)	6.15 (0.81)	4.15 (1.56)	4 (1.86)
Wonder	5.60 (1.69)	5.35 (1.26)	3.60 (1.87)	3.89 (1.33)

Table A.2
Pretest 2. Ratings of two video stimuli from the interpersonal elicitors (Large vs. Small) with means and standard deviation values

	Interpersonal	
	Large Crowd (N= 20)	Small Crowd (N= 20)
	M (*SD*)	M (*SD*)
Anger	1.41 (1)	1.18 (0.52)
Awe	4.19 (1.87)	3.59 (2.03)
Disgust	1.24 (0.75)	1.24 (0.56)
Amusement	4.35 (1.80)	5.06 (1.24)
Fear	1.82 (1.23)	1.47 (1)
Pride	4.71 (1.64)	4.41 (1.58)
Sadness	1.65 (0.99)	1.59 (1.06)
Joy	5.06 (1.56)	5.24 (1.56)
Fascination	5.35 (1.49)	5 (1.36)
Wonder	4.65 (1.57)	3.94 (1.74)

Appendix B

Survey Main Study

INFORMED CONSENT FORM

Hi!

My name is Bryan Cajas, and I am a master student in Marketing Communication Science at the University of Twente. I am conducting this experiment as part of my master thesis.

This research investigates people's prosocial and pro-environmental behaviour.

This study will include a **video** that is part of an ongoing project carried out by the **Sustainable Development Goals (SDGs)**. The Sustainable Development Goals are initiatives introduced by the United Nations (UN) back in 2015. 17 goals have been universally set to all countries which address different issues from fighting inequalities to tackling climate change, ensuring all people to enjoy peace and prosperity by 2030.

The participation in this study is anonymous and voluntary if, by any reason, you feel uncomfortable and want to stop this experiment, please feel free to do so and notify the researcher. The complete survey should take around 10-15 minutes. Be assured that all the answers you provide will be confidential. Also, the personal data you provided will be confidential and not be included in the report of this research.

If you have any questions about this research, you can ask the researcher now or email him later on b.cajas@student.utwente.nl

Please confirm that you have read the above information, and agree to take part in this study.

- ○ Yes, I consent to take part in this study
- ○ No

IDNumber

Instruction

First, you will be asked to watch attentively this video (which contains no audio), part of a work in progress by the **Sustainable Development Goals** (SDGs). After watching the video once, you can start with answering the questions. The video will continuously go on while you take part in the survey. **Please take your time while answering the questions and be as honest as possible.**

Did you watch the video once?

- ○ Yes
- ○ No

The **Sustainable Development Goals (SDGs)** are the blueprint (= plan) to achieve a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, hunger, and climate change, among other issues central to human progress and sustainable development, such as gender equality, environmental degradation, prosperity, and peace and justice. The 17 Goals interconnect and in order to leave no one behind, we must achieve each Goal and target by 2030.

To achieve these, the easiest and effective way is to donate to **non-governmental organizations (NGOs) and charities** such as "Amnesty International", "WWF" or "Human Rights Watch". Financially supporting these organizations enables people to make an impact on the themes addressed by the SDGs. The SDGs has generated different ways to fund the goals mainly through online money donation. However, collecting donations through door-to-door collection context is also possible.

Now, imagine you are at home and a person working for the SDGs rings/knocks at your door. The person explains the SDGs mission and discusses further the multiple programs the SDGs developed. At the end of the discussion, the person asks if you would make a contribution to the SDGs?

Imagine you want to make a one-time donation to the Sustainable Development Goals. How much money would you be likely to spend?

Please indicate your level of agreements with the following statements based on the scenario you just read.

	Definitely not	Probably not	Possibly	Probably	Definitely
How likely are you to volunteer your time to help the SDGs?	○	○	○	○	○
How likely are you to donate your money to help the SDGs?	○	○	○	○	○
I intend to donate money to the SDGs in the future.	○	○	○	○	○
The likelihood that I will donate to the SDGs is high.	○	○	○	○	○
I do not have the intention to donate to the SDGs.	○	○	○	○	○

Were you familiar with the Sustainable Development Goals (SDGs) before this study?

Yes ○ No ○

The money given to the SDGs goes directly to real and meaningful work related to the goals. Further, there are many other possibilities of addressing today's societal issues and changing the world for the better. Every small step starts with yourself and by doing so, you are creating a positive impact on the world.

For each of the following statements, please indicate the likelihood that you would engage in the described activity or behaviour compared to your current lifestyle.

On a scale from 0-10, how likely are you to make sacrifices to your standard of living (e.g. minimize waste, drive less and reduce household energy use) to protect the natural environment?

Not at all likely — Neutral — Extremely likely

0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○

On a scale from 0-10, how likely are you to change your daily routine to protect the environment?

Not at all likely — Neutral — Extremely likely

0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○

On a scale from 0-10, how likely are you to buy fewer new things?

Not at all likely — Neutral — Extremely likely

0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○

On a scale from 0-10, how likely are you to eat less meat?

Not at all likely — Neutral — Extremely likely

0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○

On a scale from 0-10, how likely are you to buy organic/biological food?

Not at all likely — Neutral — Extremely likely

0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○

On a scale from 0-10, how likely are you to recycle things rather than throw them away?

Not at all likely — Extremely likely

0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○

On a scale from 0-10, how likely are you to buy less non-essential stuff?

Not at all likely — Neutral — Extremely likely

0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○

For each of the following described activity or behaviour, please indicate your level of agreement.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I would work to make the world a better place.	○	○	○	○	○	○	○
I would help others to improve their lives.	○	○	○	○	○	○	○
I would help people in need or in real crisis.	○	○	○	○	○	○	○
I would not hesitate to help others when they ask for it.	○	○	○	○	○	○	○
I would work for the betterment of society.	○	○	○	○	○	○	○
I would participate in social or political movements.	○	○	○	○	○	○	○

You are now halfway through the questionnaire. For the next section, I would like to ask you questions regarding the video, seen at the start of this study, part of a work in progress from the Sustainable Development Goals (SDGs).

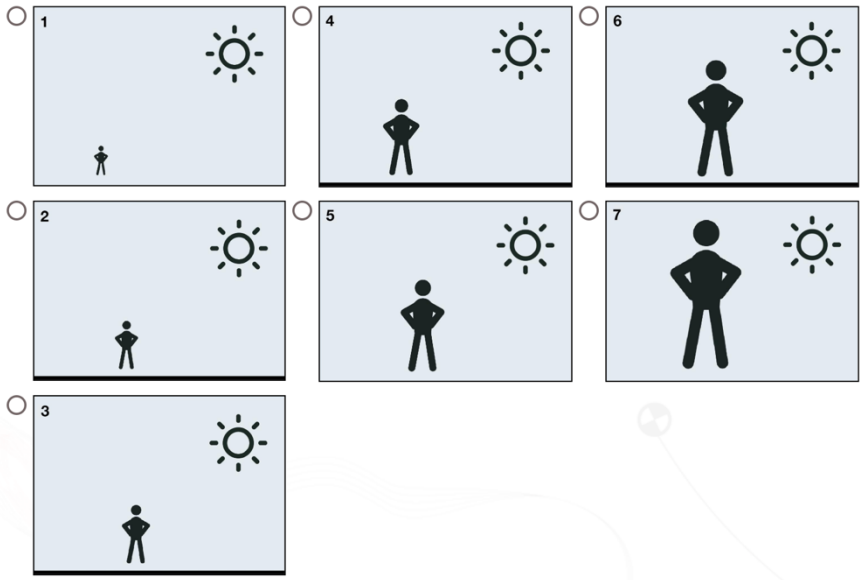
Think about how the video inspired you, please indicate to what extent you agree with the following statements. Take your time to answer this set of questions.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The video inspired a sense of being connected to everything.	○	○	○	○	○	○	○
The video inspired a sense of communion with all living things.	○	○	○	○	○	○	○
The video inspired me to experience a sense of oneness with all things.	○	○	○	○	○	○	○
The video inspired me to feel closely connected to humanity	○	○	○	○	○	○	○
The video inspired me to have a sense of complete connectedness.	○	○	○	○	○	○	○
The video inspired me to feel connected with nature and the world around me.	○	○	○	○	○	○	○
The video inspired me to feel a sense of oneness with the natural world around me	○	○	○	○	○	○	○

Based on the video you were presented; please indicate to what extent you agree with the following the statements. Take your time to answer this set of questions.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
While watching the video, I felt small or insignificant.	○	○	○	○	○	○	○
While watching the video, I felt the presence of something greater than myself.	○	○	○	○	○	○	○
While watching the video, I felt part of some greater entity.	○	○	○	○	○	○	○
While watching the video, I felt like I am in the presence of something grand.	○	○	○	○	○	○	○

Please choose which one of the following drawings best describes how you feel about your position in the world.



Please indicate to what extent you think the following emotions best described the way you felt while watching the video presented.

	While watching the video, I felt…				
	Does not describe my feelings	Slightly describes my feelings	Moderately describes my feelings	Mostly describes my feelings	Clearly describes my feelings
Pride: *feeling of respect or worthiness towards yourself or others.*	○	○	○	○	○
Anger: *feeling you get when something unfair, painful, or bad happens.*	○	○	○	○	○
Disgust: *feeling of disapproval and dislike.*	○	○	○	○	○
Fear: *unpleasant feeling by something/someone bad and distressing.*	○	○	○	○	○
Awe: *feeling of great respect and amazement in response to something/someone vast, beautiful or frightening.*	○	○	○	○	○
Amusement: *feeling of being entertained or made to laugh.*	○	○	○	○	○
Joy: *feeling of great happiness.*	○	○	○	○	○
Wonder: *feeling of great surprise and admiration.*	○	○	○	○	○
Sadness: *feeling unhappy or "down".*	○	○	○	○	○
Fascination: *state of feeling an intense interest in something/someone.*	○	○	○	○	○

Please indicate to what extent you agree, according to your attitudes, beliefs, and experiences, with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I would say that I often feel awe.	○	○	○	○	○	○	○
I would say that I see beauty all around me.	○	○	○	○	○	○	○
I would say that I feel wonder almost every day.	○	○	○	○	○	○	○
I would say that I often look for patterns in the objects around me.	○	○	○	○	○	○	○
I would say that I have many opportunities to see the beauty of nature.	○	○	○	○	○	○	○
I would describe myself as a person that seeks out experiences that challenge my understanding of the world.	○	○	○	○	○	○	○

The **Sustainable Development Goals** are achievable through various programs proposed by multiple **charities** and **non-governmental organizations (NGOs)** such as “Amnesty International”, “WWF”, “Human Rights Watch”, and many more. These NGOs focus on each of the goals from the SDGs and ultimately, achieve them by 2030.

NGOs are defined by the UN as “any non-profit, voluntary citizens” groups organized on a local, national and, international level. They perform a variety of functions but mainly, work to promote social or political change on a large or small scale. These organizations play a critical part in developing society, improving communities, and promoting citizen participation.

Please indicate to what extent you agree, according to your attitudes, beliefs, and experiences with the following statements regarding Non-Governmental Organizations (NGOs):

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
Supporting NGOs is really important to me.	○	○	○	○	○	○	○
The money given to NGOs goes to good causes.	○	○	○	○	○	○	○
My image of NGOs is positive.	○	○	○	○	○	○	○
NGOs have been quite successful in helping the needy and the environment.	○	○	○	○	○	○	○
NGOs perform a useful function for society.	○	○	○	○	○	○	○
Much of the money donated to NGOs is wasted.	○	○	○	○	○	○	○

Finally, I would like to know something about you. The following section starts off with some demographic questions, followed by questions regarding your previous donation behaviour and financial status.

What is your gender?

Male ○ Female ○ Other (please specify) ○ Preferred not to say ○

How old are you?

What is your nationality?

What is your highest level of education you have completed?

- ○ Lower than bachelor
- ○ Undergraduate education (Bachelor's degree)
- ○ Postgraduate education (Master's degree)
- ○ Higher than master

How often do you donate to a charity?

Once a week ○ Once a month ○ Once a year ○ Less than once a year ○ Never ○

What is your employment status, are you currently…?

- ○ Employed full time
- ○ Employed part time
- ○ Self-employed
- ○ Currently out of work
- ○ Retired
- ○ Student
- ○ Unable to work

What is your income

Appendix C

Reliability Analysis and scale items

Table C1.
Overview of reliability scores, mean scores, standard deviations items of the constructs

Constructs	Cronbachs' alpha	M (SD)	Items
Prosocial intention[a)]	0,82	29,3 (3,87)	1. I would work to make the world a better place. 2. I would help others to improve their lives. 3. I would help people in need or in real crisis. 4. I ~~would not hesitate to help others when they ask for it.~~ 5. I would work for the betterment of society. 6. I would participate in social or political movements.
Donation intention[b)]	0,81	17,4 (3,86)	1. How likely are you to volunteer your time to help the SDGs? 2. How likely are you to donate your money to help the SDGs? 3. I intend to donate money to the SDGs in the future. 4. The likelihood that I will donate to the SDGs is high. 5. I do not have the intention to donate to the SDGs.
Pro-environmental intention[c)]	0,82	52 (10,06)	1. How likely are you to make sacrifices to your standard of living (e.g. minimize waste, drive less and reduce household energy use) to protect the natural environment? 2. How likely are you to change your daily routine to protect the environment? 3. How likely are you to buy fewer new things? 4. How likely are you to eat less meat? 5. How likely are you to buy organic/biological food? 6. How likely are you to recycle things rather than throw them away? 7. How likely are you to buy less non-essential stuff?
Small Self[d)]	0,87	13,9 (4,59)	~~1. While watching the video, I felt small or insignificant.~~ 2. While watching the video, I felt the presence of something greater than myself. 3. While watching the video, I felt part of some greater entity. 4. While watching the video, I felt like I am in the presence of something grand.
Proneness to awe[f)]	0,73	30,8 (5,44)	1. I would say that I often feel awe. 2. I would say that I see beauty all around me. 3. I would say that I feel wonder almost every day. 4. I would say that I often look for patterns in the objects around me. 5. I would say that I have many opportunities to see the beauty of nature.

	6. I would describe myself as a person that seeks out experiences that challenge my understanding of the world.

a) 7-point Likert scale (1= Strongly disagree, 7= strongly agree), b) 5-point Likert scale (1= definitely not, 5= Definitely, c) 10-point Likert scale (1= not at all likely – 10= Extremely likely), d) 7-point Likert scale (1= Strongly disagree, 7= strongly agree), e) 7-point Likert scale (1= Strongly disagree, 7= strongly agree), f) 7-point Likert scale (1= Strongly disagree, 7= strongly agree)

Appendix D

Results

Table D1.
Mean Scores for Self-reported Emotional States Through Four Conditions

	Condition 1 N= 31	Condition 2 N= 29	Condition 3 N= 30	Condition 4 N= 31
	High Awe Nature	**High Awe Interpersonal**	**Low Awe Nature**	**Low Awe Interpersonal**
Pride	2.87 (1.28)	2.72 (0.96)	2.57 (1.27)	2.26 (1.26)
Anger	1.45 (0.85)	1.38 (0.86)	1.33 (0.84)	1.77 (1.02)
Disgust	1.10 (0.39)	1.38 (0.82)	1.13 (0.57)	2.23 (1.17)
Fear	1.42 (0.95)	1.28 (0.59)	1.37 (0.71)	1.94 (0.89)
Awe	4.19 (1.16)	2.97 (1.20)	4.16 (1.07)	2.10 (1.25)
Amusement	1.81 (1.04)	2.83 (1.31)	2.03 (1.15)	1.55 (1.02)
Joy	3.55 (1.17)	3.45 (1.12)	3.60 (1.00)	1.74 (1.12)
Wonder	3.84 (1.34)	3.03 (0.98)	4 (1.05)	2.42 (1.28)
Sadness	1.48 (0.67)	1.17 (0.53)	1.63 (0.92)	2.39 (1.30)
Fascination	4.19 (1.04)	3.76 (1.21)	4.10 (0.96)	2.48 (1.20)

Note. All responses were made using single items and 7-point scales (1= *Not at all* to 7= *Very much*), with higher values indicating greater emotional intensity.

Appendix E

Potential Covariates

The current study included two attitude constructs who are controlled as two potential covariates (i.e. previous donation behaviour and general attitude towards NGO). Overall, the results showed no significant effect of the level of awe and type of elicitors on the behavioural intention variables whilst controlling for the effect of previous donation behaviour and general attitude towards NGO (all p's < 0.05). These two covariate factors were consequently of no concern in the results section of this research.

Previous Donation Behaviour

One item assessed past donation behaviour which was *"How often do you donate to a charity?"* with a five-point Likert scale that ranged from once a week to never.

General attitude towards NGO

Past research, specializing in antecedents of specific behaviours, discovered that behavioural intentions are also measured by behavioural attitudes and attitudes towards the object (Fishbein & Ajzen, 1975). This construct comprised of six items and was adapted from several studies (Lee, 2011; Lwin & Phau, 2014). Five items measured the attitude towards charitable organizations which is represented for instance by *The money given to NGOs goes for good causes*. Moreover, one item assessed the level of involvement towards an NGO and was formulated as such *Supporting NGOs is really important to me.* Together, the Cronbach's α was highly reliable with 0.88. In the present study, the non-governmental organization is represented by the Sustainable Development Goals (SDGs), which are initiatives introduced by the United Nations.