Collective Awe and Prosocial Behavior

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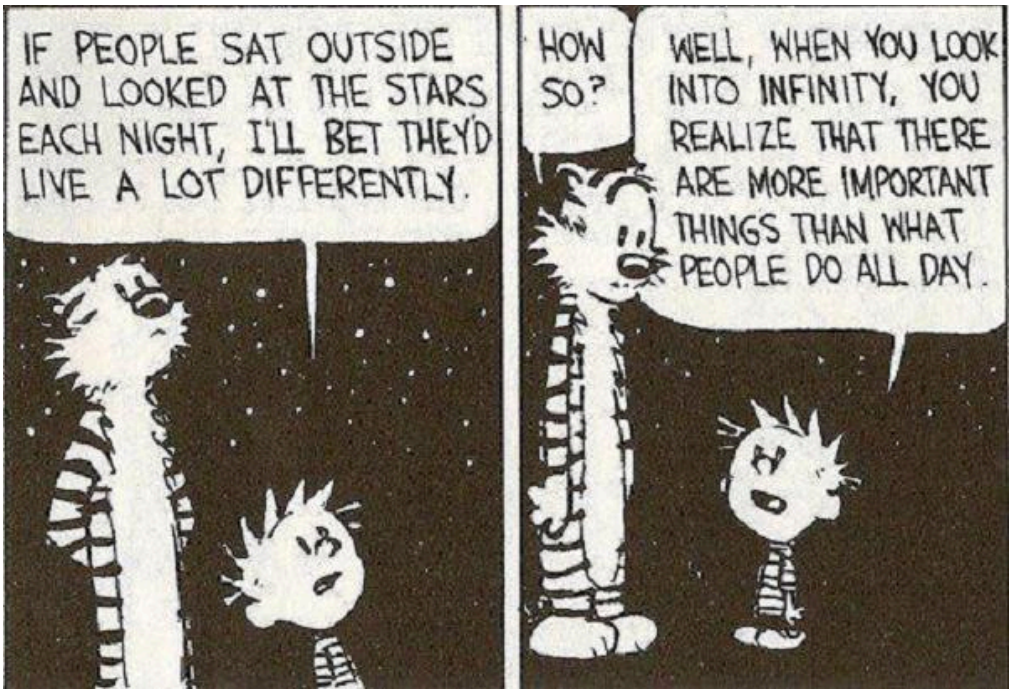

Honors Senior Thesis

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Abstract

Awe is such a unique and transformative experience that it has been referenced across multiple

disciplines for centuries. Based on past research, we chose to study the effects of “collective awe”: sharing the experience of awe with a large group of people. We hypothesized that the past findings relating awe to prosocial behavior would be enhanced when participants experienced awe collectively. In the experiment, we used video manipulations to stimulate awe and collective awe respectively. These videos were followed by a series of scales and questions to determine participants’ levels of generosity, entitlement, sense of small self, and connection with humankind or nature. However, we found no effect of collective awe on any of these prosocial behavior indicators. This suggests that further research is needed to understand the effects of awe, and how sharing this experience could impact its effects.

Collective Awe and Prosocial Behavior

There are two seconds left on the shot clock at the bottom of the fourth quarter when the

point guard shoots the basketball into the air. For the die-hard fans in the arena and watching on TV, the next two seconds seem to last for two hours. Thousands of viewers freeze, and for a moment, they completely forget about their individual identity. They forget what they have to do after this, they forget where they are, they forget the million of thoughts about themselves that normally are running through their heads every second. For the two seconds before that basket, thousands of people will, for an instant, forget their individual identities and be united in a feeling of collective awe when the basket is made. A couple of seconds after the basket, and the moment is lost. Some of the people in the stadium start documenting the moment on social media; people start remembering that they should go to the bathroom now before the line gets long. But for an instant, a community of fans was united in a feeling of collective awe.

In this study, we seek to understand the consequences of these moments in which humans lose their sense of individual selves, and the implications that this experience can have on how individuals perceive and interact with the people around them. This study is designed to show that experiencing collective awe leads to a diminished sense of self, which causes a decrease in sense of entitlement, increased feelings of generosity, and an increased sense of connection with humankind and nature.

Shift in Psychology towards Studying Positive Emotions

Historically, the field of psychology has focused on problems with the human psyche. Over the 20th century, renowned psychologists observed, studied, and wrote about anxiety, depression, psychopathy, and many other maladapted ways of thinking. Until the late 20th century, very little research was devoted to how people react to more positive conditions (Seligman & Csikszentmihalyi, 2014). In the past few decades, psychologists have started looking at the effects of positive emotions such as happiness, excitement, and awe. Such research

shows that awe is a unique "positive" emotion. There is a body of research that suggests experiencing awe that can lead people to lessen the emphasis on themselves and encourage prosociality.

Awe in Other Disciplines

Long before awe was studied from a psychological perspective, this unique phenomenon was observed and recorded within several other disciplines. *God in Search of Man*, a leading text detailing the philosophy of Judaism, references awe several times. This text details the transformative powers of awe experienced by seeking a connection with God, stating,

> there is thus only one way to wisdom: awe. Forfeit your sense of awe, let your conceit diminish your ability to revere, and the universe becomes a market place for you. Wisdom comes from awe rather than from shrewdness. It is evoked not in moments of calculation but in moments of being in rapport with the mystery of reality. The greatest insights happen to us in moments of awe. (Heschel, 1907, p. 78)

Whereas this was written long before psychologists started defining the components of awe, it remains startlingly similar to our current definition, focusing on the need to change one's perspective and awe's ability to provide clarity. While the term "awe" is rarely explicitly used in other religious texts, similar references to transformative and "cosmic" experiences that provide clarity are referenced in Hindu and Christian texts (Keltner & Haidt, 2003).

References to awe are also found in sociology, when analyzing the effects of influential speakers on the public. In Max Weber's writings on charismatic leaders, he explains how watching this type of leader is unique because they can bring about revolution or change "from the inside" by changing the listener's perspective of the world (Keltner & Haidt, 2003):

> [Charisma] manifests its revolutionary power from within, from a central metanoia

> [change] of the followers' attitudes…Instead of reverence for customs that are ancient and hence sacred, it enforces the inner subjection to the unprecedented and absolutely unique and therefore divine" (Weber, 1946, p. 1117).

What Weber describes as "charisma" can easily be interpreted as an awe-inducing stimulus.

Awe is also discussed in meditation and yoga philosophies. Kundalini yoga, an ancient branch of yoga originating from India, is designed to transform students of this practice from within through meditation, mantras, and chanting. This type of yoga requires an environment where many people are sitting together and chanting in unison. This experience is supposed to bring about an inner peace, called "shuniya":

> The experience of shuniya, the stillness at the center of the sound current, has the power to penetrate one's heart, lift the veils of maya and karma, so that one is able to see the reality of the pure Self through Divine consciousness. (Vandewalle, 2013)

Defining Awe

Clearly, awe is such a powerful experience that it has been discussed for centuries and among many disciplines. All discussions of awe, from sociological to religious, focus on the profound and transformative effect the experience can have on a person's perspective. The research that has been conducted has boiled down the definition of awe into two main components: a perceived vastness and a need for accommodation (Rudd, Vohs, & Aaker, 2012). "Perceived vastness" can refer to the vastness of anything: a physical space (e.g., the Grand Canyon), the vastness of time, or the vastness of the human ability. "Need for accommodation" means that an awe-eliciting stimulus provokes the need to update one's mental schemas to understand or accommodate for what an individual is processing. For example, dazzling views of sea life may look so different than a person's existing schema for "ocean" that it elicits awe. As

Rudd and colleagues (2012) define it, awe is an emotional response to things perceived as so vast and overwhelming that one must alter the way they understand the world.

Awe-related states are so varied it is difficult to specify the situations that could induce them. Because of this, Keltner and Haidt (2003) specified five potential criteria for scenes or experiences that could lead to awe: beauty, ability, virtue, threat, and supernatural ability. While the threat felt when watching an electrical storm, the beauty of a landscape, and the virtue of a "morally beautiful" act of kindness can create varied and unique experiences, when combined with a sense of vastness and need for accommodation, they can all induce awe.

As Kelter and Haidt (2003) explain, perceiving exceptional ability and talent can trigger a need for accommodation and elicit awe. But it is important to note that a person experiencing this type of awe would not consider their relationship to a talented person within system of hierarchy. In other words, a person in awe of a gymnast would not then admire that gymnast because they sense they are dominant or superior. In a state of awe, their positive reactions would not become mired in a system of hierarchy. This suggests that experiencing awe leads individuals to perceive their connection to others in a unique way.

Awe as a unique emotion. Between Rudd et al.'s (2012) definition of awe and Keltner and Haidt's (2003) categories of awe-inducing experiences, the psychological community has a comprehensive description of what awe is. But certainly, there are times when an individual sees a stunning nature scene and feels happy, or a person sees an incredible human feat and feels admiration or pride for the person. Neither of these people are experiencing awe, despite their positive reaction to a potentially awe-inducing stimulus. Luckily, Shiota, Keltner, and Mossman (2007) studied the ways in which awe differs from other positive experiences. Specifically, Shiota et al. identified the ways in which awe is distinct from both happiness and

accomplishment: While experiencing a sense of accomplishment heightens one's awareness of internal feelings, experiencing lessens this awareness. The study suggests that the greater awareness of personal feelings exhibited during accomplishment also leads to a heightened awareness of one's own personal values and culture, which can often lead to comparison (Shiota et al., 2007). As suggested when discussing awe induced by exceptional ability, experiencing awe does not lead to this social comparison.

The Shiota et al. (2007) study also noted the distinctions between happiness and awe. This research showed that participants in the "happiness" condition smiled significantly more than participants in the "awe" condition. This is consistent with later findings that experiencing awe was not as physiological arousing as other positive emotions, specifically anticipatory enthusiasm, attachment love, nuturant love, or amusement.

Clearly, awe changes how humans interact with and perceive the world around them. This is unique from many other emotions or experiences, which are normally all about the individual. Most emotions lead people to "turn inward" or focus on the self. Awe, on the other hand, draws one's attention away from their individual identities or personal concerns. As Shiota, Thrash, Danvers, and Dombrowski (2014) define it, awe causes people to "draw attention to that which is greater than the self, inviting us to transcend our day-to-day agendas and limits" (p. 363). Awe leads people to transcend beyond the self, allowing individuals to become less focused on or grounded in personal identifiers.

Awe and Prosocial Behavior

Ample research suggests that awe helps people focus less on their individual selves. Because of this, it is no surprise that awe has also been linked to prosocial behavior. Many psychologists have discussed the general sense of vastness and insignificance brought about by

experiencing awe, but recent research shows that awe leads to a diminished sense of self, which in turn leads to increased prosocial behavior (Piff, Dietze, Feinberg, Stancato, & Keltner, 2015). Research has also shown that experiencing awe brings people into the present moment, and therefore increases individuals perceived time availability (Rudd et al., 2012).

It is easy to assume that transcending the self, perceiving more time availability, and a diminished sense of self would lead to positive things. Several studies have looked into exactly how these changes in perception can lead to an increase in prosocial behavior. Since awe can change a person's perceived time availability, it can then lead individuals who experienced awe to be less impatient and more likely to volunteer their time (Rudd et al., 2012). A recent study (Piff et al., 2015) produced results that suggest awe, by diminishing individuals' sense of self, in turn increases an individuals' level of generosity and decreased their sense of entitlement.

There is a large body of psychological research supporting the idea that experiencing awe changes how people see themselves compared to the world around them. But how would a hypothetical shared, or "collective awe" experience change these effects? Research comparing awe and happiness has suggested that awe is inherently less social than happiness (Shiota, Keltner, & Mossman, 2007). Studies found that participants were more likely to note solitary activities (being in nature or exposure to art and music) as awe-elicitors. Alternately, participants noted more social events, like being reunited with close friends or family, as happiness elicitors. However, participants were also more likely to report another person's accomplishment as a potential awe elicitor than a happiness elicitor. This suggests that experiencing awe can in fact remove social comparison or senses of hierarchy from a relationship (Keltner & Haidt, 2003; Shiota et al., 2007) and allow individuals to feel more connected to others.

Shared Attention Theory

Even if the extant literature does not present awe as a social experience, there is a component of connection to others that may change the awe experience. To understand how experiencing awe collectively could influence the effect of awe, we turned to research on shared experiences. This research has shown that experiencing a stimulus or event with others amplifies individuals' reactions to the experience (Boothby, Clark, & Bargh, 2014). Some research argues that sharing experiences in inherently positive (Wagner et al, 2014), while other studies suggest that sharing experiences can enhance an experience positively or negatively (Boothbyet al., 2014), with unpleasant experiences becoming more negative and pleasant experiences becoming more positive when shared. Either way, individuals' clearly show an increased reaction to experiences when they experience things with other people.

Shared attention theory (Shteynberg, 2015) suggests that when someone attends to an object or event along with other people, they end up directing more cognitive resources towards the stimulus than they would if they were attending to the stimulus on their own. This leads to better memory, more extreme or amplified judgments, and higher affective intensity, among other things (Shteynberg, 2015). Research also shows that these effects are present even when individuals do not look at each other or look at another person also viewing the stimulus. The mere awareness that another person may be attending to the same stimulus yields the shared attention effects (Shteynberg, 2015).

The Current Research: Collective Awe and Prosocial Behavior

When you combine the observed effects of awe with the effects of shared attention, it seems clear that experiencing awe with a large group of people should enhance awe's effect on a diminished sense of self, leading to and increase in generosity and a decrease in entitlement. Additionally, because awe affects how people view themselves in relation to others, it seems

likely that awe would lead to an increased sense of connection with humankind. If this is true, then experiencing awe collectively would amplify this sense of connection.

Therefore, in this study I aim to examine whether “collective awe” has prosociality advantages that exceed the advantages afforded by individually experienced awe. By replicating the Piff et al. (2015) study on awe and prosocial behavior, we hope to further support current findings, and see if these findings are enhanced when the awe manipulation is experienced collectively. We have also extended this study to consider other prosocial effects of awe, such as connection to humankind and nature. This study is designed to show that experiencing awe collectively will amplify the prosocial effects of awe. Specifically, experiencing collective awe will lead to an increase in generosity, a further diminished or small sense of self, an increased sense of connection with humankind and nature, and a decreased sense of entitlement.

Method

Participants and Design

Participants were 144 undergraduate students (115 female; ages 18–35 years) recruited from DePaul University's introductory psychology courses, who completed the experiment for course credit. Five additional participants completed the study, but their data was unusable due to computer errors. Two other participants' data were dismissed because the participants did not follow instructions. The study used a single-factor (Video Condition: individual baseline, individual awe, collective awe) between-subjects design.

In accordance with IRB requirements, all participants received information on the experimental procedure prior to participating. Following the completion of all tasks, participants were debriefed and compensated accordingly.

Procedure

Participants were recruited to complete a study on nature and personality. All materials and measures were administered on personal computers running MediaLab experimental software (Empirisoft Corporation, 2012).

The experiment (including most of the measures) was adapted from Piff et al. (2015). First, participants watched a brief (5-minute) nature video. Depending on the condition, the video was designed to either elicit awe, or act as a pleasant but non-awe-invoking stimulus. Superimposed on the bottom of the video was a dynamic two-line graph, controlled by participants, that indicated their ongoing sense of positive or negative emotion while watching the video.

After viewing the video to which they are assigned, participants completed a "game" to determine their level of generosity, as adapted from the dictator game used in the Piff et al., 2015 study. As an additional generosity measure, participants also chose whether or not to submit their email to receive information from an environmental conservation charity.

Participants were then ostensibly reoriented to the actual study. They completed a series of questionnaires that measured their emotions during the video, sense of self (adapted from Piff et al., 2015), connection with humankind and nature (adapted from Aron et al., 1991), sense of entitlement (adapted from Campbell et al. 2004), and proneness to awe (adapted from Shiota et al., 2006). Finally, participants provided basic demographic information (in which a second, implicit measure of entitlement was embedded), were thanked for their time, and debriefed.

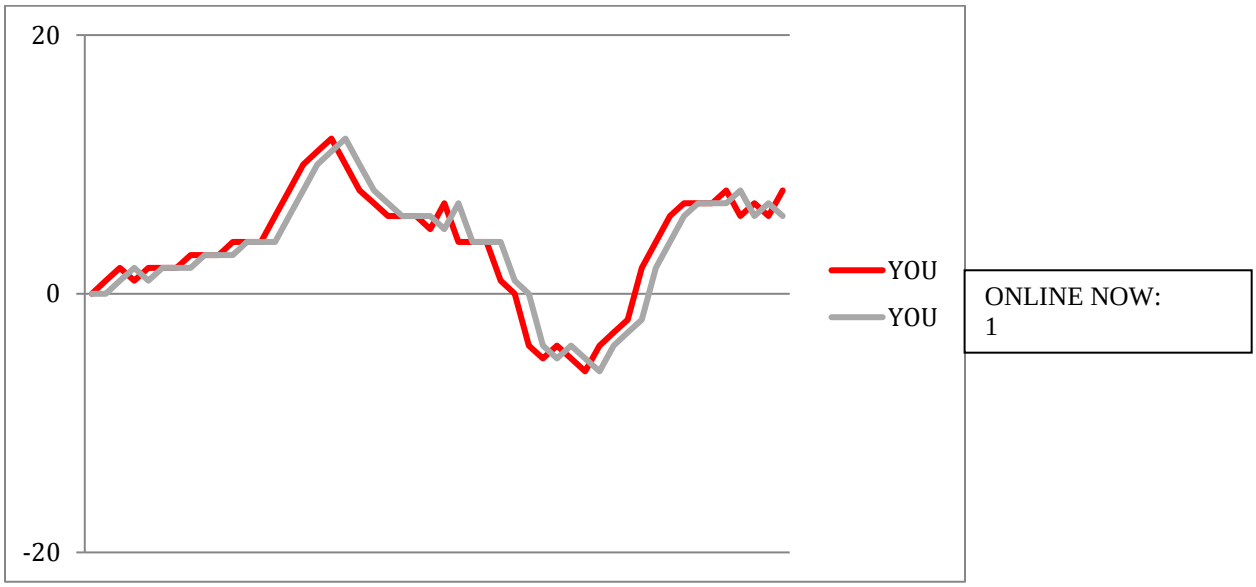
Materials

Video manipulation. Participants watched one of two videos: For the individual awe and collective awe conditions, the video depicted landscape scenes that dynamically shifted in scope from close up to far away to convey vastness (one of the known elicitors of awe; Keltner & Haidt, 2003) and that had a musical soundtrack with similar "scope" shifts (e.g., in loudness and intensity, presence of crescendos, sudden changes in dynamics). For the baseline condition, the video also depicted nature scenes, but without the visual or auditory dynamism known to heighten the experience of awe. The videos were presented via computer, with participants wearing headphones to intensify the auditory experience.

Individual versus collective experience manipulation. Beneath the video on the computer screen was a second window that depicted a dynamic two-line graph, which participants controlled to indicate their ongoing emotional experience (see Figure 1). Participants were instructed to use the up- and down-arrow keys on the computer keyboard while viewing the video to indicate the intensity of their emotional experience in real time; the starting point was be neutral, up-arrow presses indicated more intense positive emotion and down-arrow key presses indicated more intense negative emotion.

For participants in the individual baseline and awe conditions, both lines were said to

represent the participants' own ratings; both lines did, in fact, depict the participants' intensity ratings in real time. For participants in the collective awe condition, one line was said to represent the participant's real-time ratings, and the other to represent the average of everyone currently viewing the video; the (fictitious) group average line represented the participant's rating plus some amount of random deviation so that it tracked *generally* with the participant's true depicted real-time ratings but deviated enough to be believable as representing a collective rating.



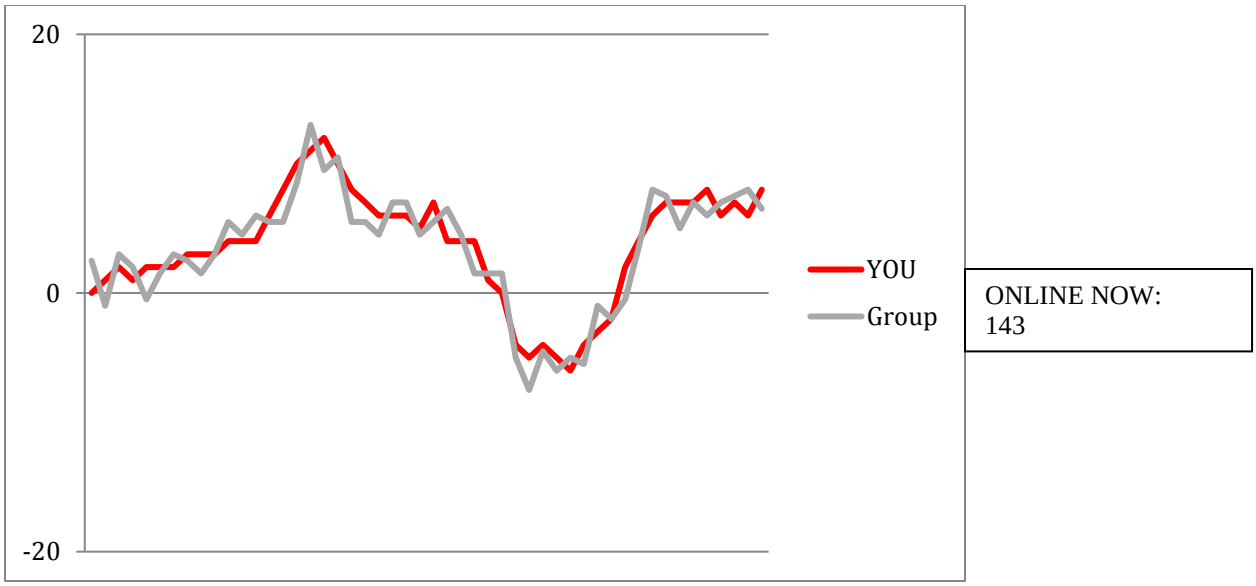


Figure 1. Both panels are designed to represent the participants' positive and negative emotions while watching a video. In the top panel both lines represent the participants' ratings, which they determine by pressing arrow keys. The bottom panel shows the participants' ratings in reference to an imaginary group average. The top portion of the figure represents the individual baseline and awe conditions; the bottom portion of the figure represents the collective awe condition.

Generosity. Participants in all conditions were then taken to a page informing them that the video was provided by a small video production company, who had also offered a $100 iTunes gift card in exchange for access to the ratings given to their videos. Participants were told that we would be raffling off the gift card once we achieve our target number of participants. Participants were told that the iTunes gift card was being raffled off to all participants based on how many entries into the raffle the participant was allotted. Participants were informed that each participant was randomly paired with another participant in a different session, and 10 points (which counted as the number of entries into the raffle) were being allocated to each pair.

Participants learned that they would play as a "decider" in a distribution task. As deciders, participants were told they would receive 10 raffle tickets that were theirs to keep, but had the option to give some of the raffle tickets to another random participants who received no tickets. Participants were then asked how many of the 10 raffle tickets, if any, they wanted to share with the other participant with whom they had been paired.

Prosocial behavior. Participants completed a second generosity measure in which they were told that the company providing the raffle also supports a nature conservation charity (the fictitious *Nature Conservancy*). Participants were asked whether they would be interested in providing their email address for more information. Participants who responded affirmatively were then asked what types of emails they would like to receive. Participants were given the option of giving their email address to receive occasional emails, a weekly newsletter, and/or an email instructing how to donate. Participants were instructed to select all of the email options that they were interested in.

Emotions. Participants rated to what extent they were experiencing each of a series of emotions on a 7-point Likert scale from 0 (*not at all*) to 6 (*very much*). The emotion labels targeted awe (awe, wonder, amazement), other positive emotions (happiness, relaxation, satisfaction), and negative emotions (frustration, anxiety, sadness, boredom; included as fillers).

Small self. Participants read a set of statements and rated to what extent they experienced each while watching the video on a 7-point Likert scale from 0 (*not at all*) to 6 (*very much*). Sample questions include "I felt the presence of something greater than myself," "I felt part of some greater entity," and "I felt small or insignificant."

Connectedness. Participants completed an adapted two-item version of the Inclusion of Other in the Self measure (Aron, Aron, & Smollan, 1992). They were presented with an image

of seven pairs of circles that varied from complete separation (1) to almost-complete overlap (7). Participants were asked to imagine that the circles shown represented them and humankind or nature, respectively. Participants chose the pair that best represented how connected they felt to humankind and to nature; the order of the two items was randomized across participants.

Explicit entitlement. Participants rated to what extent they agreed with a set of statements on a 7-point Likert scale from 0 (*not at all*) to 6 (*very much*). Sample items included, "I honestly feel I'm just more deserving than others," "Great things should come to me," and "If I were on the Titanic, I would deserve to be on the first lifeboat." The statement "I do not necessarily deserve special treatment" was also included and reverse-scored.

Proneness to awe. Participants rated to what extent they agreed with the following statements on a 7-point Likert scale from 0 (*not at all*) to 6 (*very much*). The questionnaire was adapted from Shiota et al. (2006). Sample items include, "I see beauty all around me," "I feel wonder almost every day," and "I often look for patterns in the objects around me."

Implicit entitlement. To assess participants' implicit sense of entitlement, one item was added to the end of the demographics survey. Specifically, participants were asked, "Imagine that you were able to choose your pay for this study. How much money do you think you deserve for completing this experiment?" Participants could choose any whole dollar amount from $1.00 to $10.00.

Results

Unless otherwise noted, all data were analyzed using single-factor (Video Condition: individual baseline, individual awe, collective awe) between-subjects analyses of variance (ANOVAs). Bonferroni-corrected *t*-tests were used to probe significant effects.

Descriptive statistics are presented in Tables 1 and 2.

Table 1
Mean Scores [95% Confidence Intervals] as a Function of Video Condition, Emotion Ratings

	Individual Baseline (n = 43)	Individual Awe (n = 54)	Collective Awe (n = 47)	Overall (n = 144)
Awe	3.35 [2.90, 3.79]$_{1}$	4.93 [4.53, 5.33]$_{2}$	5.32 [4.89, 5.75]$_{2}$	4.53 [4.29, 4.78]
Wonder	3.72 [3.37, 4.07]$_{1}$	5.22 [4.91, 5.54]$_{2}$	5.09 [4.75, 5.42]$_{2}$	4.68 [4.48, 4.87]
Amazement	3.12 [2.73, 3.50]$_{1}$	5.22 [4.88, 5.57]$_{2}$	5.40 [5.04, 5.77]$_{2}$	4.58 [4.37, 4.79]
Composite Awe	3.40 [2.94, 3.85$_{a}$	5.12 [4.84, 5.40]$_{a}$	5.27 [5.07, 5.50]$_{a}$	4.60 [4.41, 4.78]
Amusement	3.07 [2.54, 3.59]$_{1a}$	3.96 [3.49, 4.44]$_{2b}$	4.36 [3.86, 4.87]$_{2b}$	3.80 [3.51, 4.09]
Satisfaction	3.54 [3.10, 3.97]$_{1a}$	4.52 [4.13, 4.91]$_{2b}$	4.72 [4.31, 5.14]$_{2b}$	4.26 [4.01, 4.49]
Happiness	4.19 [3.86, 4.51]$_{1b}$	4.96 [4.67, 5.26]$_{2a}$	4.98 [4.67, 5.29]$_{2a}$	4.71 [4.53, 4.89]
Relaxation	4.70 [4.37, 5.03]	5.15 [4.86, 5.44]	5.21 [4.90, 5.53]	5.02 [4.84, 5.20]
Anxiety	0.58 [0.19, 0.98]	0.98 [0.63, 1.36]	0.92 [0.54, 1.29]	0.83 [0.61, 1.04]
Boredom	2.44 [2.04, 2.84]	0.85 [0.49, 1.21]	0.98 [0.59, 1.36]	1.42 [1.20, 1.65]
Frustration	0.54 [0.29, 0.78]	0.28 [0.06, 0.49]	0.23 [0.06, 0.49]	0.35 [.22, 0.48]
Sadness	0.44 [0.12, 0.76]	0.93 [0.64, 1.21]	0.89 [0.59, 1.20]	0.75 [0.58, 0.93]

Note. Possible range: 0 to 6. Across rows, means with different numerical subscripts differ at $p < .05$. Within columns, means with different alphabetical subscripts differ at $p < .05$; for simplicity, this analysis was conducted comparing only the awe composite to the other positive non-awe emotions.

Manipulation Check: Emotions

Our manipulation check analysis focused on positive emotions; the negative emotions were included only as fillers (but are presented in Table 1 for the reader's interest).

The primary analysis was a series of single-factor ANOVAs as a function of video condition run separately for each positive emotion (following Piff et al., 2015). All yielded significant effects of video condition, all $F > 6.36$, all $p < .003$. I predicted that participants in the individual awe and collection awe conditions would report significantly more awe-related emotions than participants in the individual baseline condition. As shown in Table 1, results showed that participants reported experiencing all positive emotions to a greater extent in the individual awe and collective awe conditions than in the baseline condition.

A second set of analyses was run comparing awe to other positive emotions. We created a composite awe score by averaging across the awe-related emotions (awe, wonder, and amazement, Cronbach's alpha= .87). We ran these scores in single-factor ANOVAs as a function of emotion type (composite awe, amusement, satisfaction, happiness) separately for each condition; all yielded significant effects of emotion type, all $F > 8.16$, all $p < .001$. I predicted that participants in the individual awe and collective awe video conditions would experience more awe-related emotions than non-awe positive emotions, whereas participants in the individual baseline condition would not differentiate among the positive emotions.

Results showed that participants in the baseline condition reported significantly higher levels of happiness than satisfaction, amusement, or awe-related emotions. More importantly, in both the individual awe and collective awe conditions, participants reported significantly higher levels of awe-related emotions than satisfaction or amusement. However, these participants did not report significant differences between experienced awe-related emotions and significant happiness.

Table 2
Mean Scores [95% Confidence Intervals] as a Function of Video Condition, Dependent Measures

	Individual Baseline (n = 43)	Individual Awe (n = 54)	Collective Awe (n = 47)	Overall (n = 144)
Points given	3.26 [2.46,4.05]	3.15[2.43, 3.87]	4.35 [3.58, 5.12]	3.59 [3.15, 4.03]
Extent of interest	1.33 [1.06,1.61]	1.19 [.961,1.40]	1.21 [.963,1.46]	1.25 [1.10, 1.39]
Small self	2.54 [2.18,2.91]	3.61 [3.29, 3.94]	3.77 [3.42,4.12]	3.31 [3.11, 3.51]
Connection	4.66 [4.34,4.99]	4.37[4.08, 4.66]	4.72 [4.41, 5.04]	4.59 [4.41, 4.76]
Explicit entitlement	1.90 [1.57,2.23]	1.94 [1.65, 2.24]	1.95 [1.63, 2.27]	1.93 [1.75,2.11]
Implicit entitlement	3.33 [2.54,4.11]	4.13 [3.43, 4.83]	3.38 [2.63, 4.14]	3.61 [3.18, 4.05]

Note. Possible range: points given, implicit entitlement, 1 to 10; interest in charity, 0 to 1; extent of interest, 1 to 3; connection with humankind, connection with nature, 1 to 7; small self, explicit entitlement, 0 to 6.

Generosity

Points given. Participants' generosity was measured by analyzing the number of points participants chose to give to another participant. It was predicted that participants in the collective awe condition would show more generosity than participants in the individual awe condition, who would show more generosity than participants in the individual baseline condition. Contrary to predictions, the analysis failed to yield a reliable effect of video condition, $F(2, 138)$, $MSE = 6.967$, $p = .056$, $\eta^2_p = .041$.

Interest in charity. Participants' yes/no responses regarding their interest in learning more about the (fictitious) charity involved in the research were analyzed in a chi-square as a function of video condition. It was predicted that participants in the collective awe condition would be more likely to respond "yes" than participants in the individual awe condition, who would be more likely to respond "yes" than participants in the individual baseline condition. Contrary to predictions, results showed no significant differences in interest in charity across

conditions, $\chi^2(2) = 1.777$, p=.411.

Extent of interest. For those participants who did indicate interest, we examined the number of types of emails they agreed to receive. It was predicted that results would show an effect of video condition on levels of generosity, with participants in the collective awe condition showing more interest than participants in the individual awe condition, who would show more interest than participants in the individual baseline condition. Again contrary to predictions, the analysis failed to yield a reliable effect of video condition, $F(2, 57)$, $MSE = .102$, $p = .705$, $\eta^2_p = .012$).

Small Self

Participants' sense of self was calculated by averaging across their small self ratings (Cronbach's alpha = .895).

I predicted that participants in the collective awe condition would show smaller senses of self than participants in the individual awe condition, who would show smaller senses of self than participants in the individual baseline condition. The analysis yielded a main effect of video condition, $F(2, 141)$, $MSE = 1.460$, $p > .001$, $\eta^2_p = .163$. As predicted, participants in the individual and collective awe conditions showed significantly smaller senses of self (Ms = 3.611 and 3.772, respectively) compared to baseline participants ($M = 2.542$), both $p < .01$(. However, there was no significant difference in small sense of self between individual and collective awe conditions, $p = .1.00$.

Sense of Connection

Participants' ratings of connection with humankind and nature were analyzed using a 3 (Video Condition: individual baseline, individual awe, collective awe) × 2 (Connection Target: humankind, nature) mixed-model ANOVA with connection target as a within-subjects factor.

It was predicted that the analysis would yield an effect of video condition, with participants in the collective awe condition reporting more connection than participants in the individual awe condition, who would report more connection than participants in the individual baseline condition.

Contrary to predictions, there was no effect of video condition, $F(2, 141)$, $MSE = 3.627$, $p = .216$, $\eta^2_p = .022$. There were also no main or interaction effects involving connection target, both $p > .22$.

Explicit Entitlement

Participants' sense of explicit entitlement was calculated by averaging across their entitlement ratings (Cronbach's alpha = .823).

It was predicted that the analysis would yield an effect of video condition, with participants in the collective awe condition reporting less entitlement than participants in the individual awe condition, who would report less entitlement than participants in the individual baseline condition. Contrary to predictions, there was no significant effect of video condition on participants' ratings of explicit entitlement, $F(2, 141)$, $MSE = 1.215$, $p = .972$, $\eta^2_p < .001$.

Implicit Entitlement

Participants' sense of implicit entitlement was measured by analyzing the dollar amount chosen in the implicit entitlement measure. It was predicted that the analysis would yield an effect of video condition, with participants in the collective awe condition reporting that they deserved a smaller payment than participants in the individual awe condition, who would report deserving a smaller payment than participants in the individual baseline condition.

Contrary to predictions, there was no effect of video condition on participants' implicit entitlement, $F(2, 141)$, $MSE = 6.827$, $p = .230$, $\eta^2_p = .021$.

Discussion

In the current experiment, participants were induced to feel awe either individually or as part of a virtual collective (or were not induced to feel awe), and then completed questionnaires designed to assess their sense of self, connectedness with humankind and nature, and prosociality. The awe manipulation was effective (although collective awe participants did not experience more awe than individual awe participants), but the only observed consequence was a decreased sense of self (again, with collective awe participants showing no greater effect than individual awe participants).

The results thus support the hypothesis that experiencing awe promotes a diminished sense of self, the theoretical precursor to prosociality. However, the results did not show consequences for prosociality. This is contrary to past research, which has shown significant effects of awe on generosity and entitlement (Piff et. al, 2015).

Contrary to predictions, the results did not show differential effects for individual versus collective awe: Participants in these conditions did report experiencing more awe than participants in the baseline condition, but collective awe participants did not report more awe than individual awe participants. Similarly, participants in the individual and collective awe conditions did report feeling a smaller sense of self than participants in the baseline condition, but collective awe participants' sense of self was no more diminished than individual awe participants' sense of self. Unlike past studies on shared attention, we observed no significant differences between participants in the individual awe and collective awe conditions throughout the entire study (Shteynberg, 2015).

Generally, the current study is not consistent with past findings related to shared attention and awe, respectively. However, there were several limitations to this study that could have led

to these findings. While the manipulation check showed that the awe stimulus was effective, the "collective" manipulation may not have been strong enough to have an effect. If participants were not paying attention to the graph or the number of other people watching, they may have not felt that they were in fact sharing this experience with others. In future studies, a stronger "collective" manipulation could lead to different results. This manipulation may be more effective if the fact that others are sharing the experience is more salient: if the participant can see the faces of the other people watching, for example. Based on shared attention theory, there is still a large body of research that suggests sharing the awe experience would have a significant effect on participants' reactions. Unfortunately, this still does not explain why we were unable to replicate Piff's findings in our individual awe condition (Piff et al, 2012). This requires future research to see if Piff's findings are in fact replicable.

Even this study's modest findings have profound implications for the real world. It shows that one awe-inspiring moment can change how people see themselves in reference to the rest of the world. While our study failed to show the expected effects of smaller senses of self (like generosity and decreased entitlement), a person thinking they are not that important in the grand scheme of things alone can change how they interact with the world for the better. While future research is necessary to understand the range of effects experiencing awe can have, it clearly gives people a better sense of perspective.

Conclusion

In conducting this study, we hoped to learn more about how sharing the experience of awe could effect how a person interacts with the rest of the world. This study showed that participants who experiences awe exhibited a significantly smaller sense of self compared to the baseline. However, our other results were inconclusive. We were unable to replicate Piff's results

relating awe to prosociality or show any differential effects between the individual and collective awe conditions. Further research is required to understand how sharing the awe experience changes the implications of awe. However, this study shows that experiencing awe makes individuals less focused on themselves and their own interests—arguably critical to focusing on and helping others—demonstrates that awe is an important and influential emotion that demands further research. Understanding this basic but powerful human reaction can help to further understand how, when, and why people act altruistically.

References

Boothby, E. J., Clark, M. S., & Bargh, J. A. (2014). Shared experiences are amplified. *Psychological Science, 25,* 2209–2216.

Heschel, A. J. (1907). God in search of man. New York, NY: Farrar, Straus, and Giroux.

Keltner, D., & Haidt, J. (2003). Approaching awe, a moral, spiritual, and aesthetic emotion. *Psychology Press, 17(2),* 297-314.

Piff, P., Dietze, P., Feinberg, M., Stancato, D., & Keltner, D. (2015). Awe, the small self, and prosocial behavior. *Journal of Personality and Social Psychology,* 883-899.

Rudd, M., Vohs, K., & Aaker, J. (2012). Awe expands people's perception of time, alters decision making, and enhances well-being. *Psychological science,* 1130-1136.

Shiota, M., Keltner, D., & Mossman, A. (2007). The nature of awe: Elicitors, appraisals, and effects on self-concept. *Psychology Press, 21(5),* 944-963.

Shiota, M. N., Neufeld, S. L., Yeung, W. H., Moser, S. E., & Perea, E. F. (2011). Feeling good: Autonomic nervous system responding in five positive emotions. *Emotion,* 1368-1378.

Shiota, M. N., Thrash, T. M., Danvers, A. F., & Dombrowski, J. T. (2014). Transcending the self: awe, elevation, and inspiration. In M. M. Tugade (Ed.), *Handbook of positive emotions* (pp. 362-377). New York, NY: Guilford Press.

Shteynberg, G. (2015). Shared Attention. *Perspectives on Psychological Science, 10*(5), 579-590.

Valdesolo, P.& Graham, J. (2014). Awe, uncertainty, and agency detection. *Psychological science, 25(1),* 170-178.

Vandewalle, Kelley M. (2013). Transformative power of Kundalini Yoga, meditation & mantra: A dialogue between Kundalini yogic philosophy and the depth psychological tradition. *Pacifica graduate institute, 3552262,* 1-190.

Wagner, U., et al. (2014). Beautiful friendship: Social sharing of emotions improves subjective feelings and activates the neural reward circuitry. *Social cognitive and affective neuroscience, 10,* 801-808.

Watterson, B. (n.d.). Calvin and Hobbes look out into the stars and ponder infinity. [Cartoon]. In *Calvin and Hobbes*.

Weber, M., Gerth, H., & Mills, C. W. (1946). *From Max Weber: Essays in sociology*. New York: Oxford University Press.