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Awe Expands People's Perception of Time, Alters Decision Making, and Enhances Well-Being

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Abstract

When do people feel as if they are rich in time? Not often, research and daily experience suggest. However, three experiments showed that participants who felt awe, relative to other emotions, felt they had more time available (Experiments 1 and 3) and were less impatient (Experiment 2). Participants who experienced awe also were more willing to volunteer their time to help other people (Experiment 2), more strongly preferred experiences over material products (Experiment 3), and experienced greater life satisfaction (Experiment 3). Mediation analyses revealed that these changes in decision making and well-being were due to awe's ability to alter the subjective experience of time. Experiences of awe bring people into the present moment, and being in the present moment underlies awe's capacity to adjust time perception, influence decisions, and make life feel more satisfying than it would otherwise.

Keywords

time perception, emotions, well-being, decision making, preferences

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Time might be the scarcest commodity for many people in modern life. A recent poll of more than 1,000 Americans found that nearly half (47%) felt they lacked enough time in daily life (Carroll, 2008). This feeling of having too much to do and not enough time to do it—or "time famine" (Perlow, 1999)—has been linked to undesirable side effects, including trouble sleeping, stress, difficulty delaying gratification, and postponing seeing a doctor when ill (Lehto, 1998; Vuckovic, 1999; C.-B. Zhong & DeVoe, 2010). In light of these findings, we asked, what can be done to shift people's perception of how much time is available?

In three experiments, we examined whether *awe*, defined as the emotion that arises when one encounters something so strikingly vast that it provokes a need to update one's mental schemas (Keltner & Haidt, 2003), can expand perceptions of time availability. Additionally, we investigated whether feeling awe, through engendering the sense that more time is available than perceived otherwise, can alter prosocial decisions concerning time, consumption preferences, and well-being assessments. We predicted that people induced to feel awe, relative to those induced to feel other states, would be more willing to volunteer their time, would prefer experiential goods over material ones, and would experience a boost in life satisfaction.

Can the Experience of Awe Increase Perceived Time Availability?

The burgeoning research on awe depicts it as a distinct (Ekman, 1992; Shiota, Campos, & Keltner, 2003) and powerful emotion with two defining features (Keltner & Haidt, 2003; Shiota, Keltner, & Mossman, 2007). First, awe involves perceptual vastness, which is the sense that one has encountered something immense in size, number, scope, complexity, ability, or social bearing (e.g., fame, authority). Second, awe stimulates a need for accommodation; that is, it alters one's understanding of the world (Keltner & Haidt, 2003). These features of awe are intertwined, so that events that expand one's usual frame of reference—such as natural events (e.g., thunderstorms), personal transitions (e.g., childbirth), or unfathomable structures (e.g., the Grand Canyon)—stimulate new mental models.

But does awe have the potential to increase perceived time availability? Prior research suggests that it does. Experiences involving awe, such as optimal athletic performances (Ravizza,

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1977), peak experiences (Maslow, 1964), and spiritual or mystical events (L. M. Fredrickson & Anderson, 1999), often also involve a sense of timelessness (Csikszentmihalyi & Hunter, 2003). The phenomenology of awe, therefore, suggests that it might expand perceptions of time.

Prior theory, too, has suggested that awe might have the ability to increase perceived time availability. For instance, two psychological theories provide support. The first is the extended-now theory (Vohs & Schmeichel, 2003), which suggests that focusing on the present moment elongates time perception. Awe focuses people's attention on what is currently unfolding before them, and the extended-now theory predicts that such focus would expand the perception of time. The second theory is the socioemotional selectivity theory (SST), which posits that people are motivated to acquire new knowledge when time feels expansive (Carstensen, Isaacowitz, & Charles, 1999). Awe triggers in people a desire to make new knowledge structures (Keltner & Haidt, 2003). Thus, a speculative suggestion from SST is that awe's ability to stimulate the creation of mental schemas may be a signal that the mind perceives an expanded amount of time in response to awe.

The Consequences of Perceived Time Availability

Whether people believe they have enough time to accomplish their goals affects numerous outcomes. First, perceived time availability influences some prosocial behaviors. Classic studies on the power of the situation demonstrate that feeling time pressured hinders the tendency to help someone in distress (Darley & Batson, 1973). Insufficient time availability is also a common barrier to volunteering and engaging in community service (Strober & Weinberg, 1980), behaviors linked to greater well-being (Thoits & Hewitt, 2001). Therefore, we predicted that creating the perception that more time is available would augment people's willingness to spend time helping other people.

Second, time perception affects choices that people make about how to live life. For instance, feeling that one lacks time is associated with markers of unhealthy diets, such as eating few family meals at home (Neumark-Sztainer, Hannan, Story, Croll, & Perry, 2003) and consuming fast food (Darian & Cohen, 1995). Furthermore, not having enough time is an often-cited reason for not engaging in leisure experiences (Mannell & Zuzanek, 1991). Elongated time perception may also influence product decisions, such that one desires to acquire experiences as opposed to material goods (Van Boven & Gilovich, 2003)—a decision pattern associated with enhanced well-being (J. Zhong & Mitchell, 2010). Indeed, one quality of experiential products is that they, by their nature, require the experiencer to devote time in order to savor the attendant feelings and sensations (Quoidbach, Dunn, Petrides, & Mikolajczak, 2010). Thus, we predicted that inducing a sense of ample time availability would lead people to choose experiences over material goods.

Third, one's sense of the amount of time available is often an indicator of health and well-being. Feeling that time is constricted is associated with a heightened risk of hypertension (Yan et al., 2003) and with ailments such as headaches, stomach pain, and poor sleep quality (Kivimäki, Kalimo, & Julkunen, 1996; Spence, Helmreich, & Pred, 1987). Mental health also suffers to the extent that time feels compressed. For instance, people who report feeling "always" rushed have lower life satisfaction than do others (Robinson & Godbey, 1997), and feeling that one has little time available has been linked to depression symptoms (Roxburgh, 2004). Consequently, we predicted that elongating perceptions of time, by eliciting awe, would lead people to experience boosts in momentary life satisfaction.

Overview of the Experiments

In Experiment 1, we examined whether awe would alter time perception by first manipulating whether people were induced to feel awe or happiness and then having them rate self-perceived time availability. Experiment 2 examined whether feeling awe, relative to feeling happiness, would alter time perception (i.e., impatience) and, in turn, willingness to donate time. Experiment 3 tested whether awe, compared with a neutral state, would increase participants' choice of experiential (vs. material) goods and momentary life satisfaction, two outcomes that we hypothesized would follow from awe's ability to expand perceptions of time.

Experiment 1

Experiment 1 tested the hypothesis that feeling awe can expand people's perception of time. We chose happiness as the comparison state because awe and happiness are alike in being positively valenced and having the ability to broaden one's perspective (B. L. Fredrickson, 2001), but differ in whether perceptual vastness and a need for accommodation are experienced (Shiota et al., 2007).

Because awe is often elicited during events such as exposure to music or nature (Shiota et al., 2007), and because these events commonly occur when people are under minimal time pressure, it is possible that an expanded perception of time is a prerequisite for experiencing awe and not a consequence of it. To address this alternative, we initially primed all participants to perceive time as constricted, before they received a novel manipulation in which they were induced to feel either awe or happiness.

Method

Participants. Sixty-three students (39 women, 24 men) participated for $20.

Procedure. To provide a cover story, we told participants that they would be participating in several unrelated studies. In the

first of three surveys, they were given a sentence-unscrambling task (Srull & Wyer, 1979) involving 12 sets of words. Each set consisted of five words (e.g., "not available enough time much"), and participants were asked to use four of them to create a meaningful phrase. Half of the unscrambled word sets pertained to non-time-related topics, whereas the other word sets pertained to the idea of constricted time. A pretest ($N = 30$) confirmed that completing this task ($M = 5.33$, $SD = 1.53$), compared with a control sentence-unscrambling task (with all non-time-related word sets; $M = 4.13$, $SD = 1.22$), resulted in higher ratings on a two-item index of perceived time constriction ("I am pressed for time," "Time is constricted"; 1 = *strongly disagree/not at all*, 7 = *strongly agree/very much*; $\alpha = .88$), $F(1, 28) = 5.65$, $p = .03$, $\eta_p^2 = .17$.

In the second survey, participants were randomly assigned to watch either an awe-eliciting 60-s commercial for an LCD television or a happiness-eliciting one. The awe-eliciting commercial depicted people in city streets and parks encountering and interacting with vast, mentally overwhelming, and seemingly realistic images, such as waterfalls, whales, and astronauts in space. The happiness-eliciting commercial depicted people in city streets and parks encountering and interacting with rainbow confetti falling through the air and a parade of smiling, joyful people who were waving flags while wearing brightly colored outfits and face paint. Participants then completed filler questions about television brands.

In the third, and final, survey, participants rated their agreement with items about personal beliefs. Embedded among fillers were four key items: "I have lots of time in which I can get things done," "Time is slipping away" (reverse-scored), "Time is expanded," and "Time is boundless" (1 = *strongly disagree/not at all*, 7 = *strongly agree/very much*). We averaged the ratings for these items to create a perceived-time-availability index ($\alpha = .86$). Last, participants reported the degree to which they were currently experiencing each of eight feelings ("angry," "awe," "sad," "happy," "calm," "bored," "excited," and "afraid"; 1 = *not at all*, 7 = *very much*).

Results and discussion

Manipulation checks. Emotion reports confirmed that participants in the awe condition ($M = 6.06$, $SD = 0.91$) experienced stronger feelings of awe during the experiment than did participants in the happiness condition ($M = 3.84$, $SD = 1.88$), $F(1, 61) = 35.97$, $p < .01$, $\eta_p^2 = .37$. In turn, participants in the happiness condition ($M = 5.61$, $SD = 0.88$) experienced stronger feelings of happiness than did participants in the awe condition ($M = 4.84$, $SD = 1.53$), $F(1, 61) = 5.95$, $p = .02$, $\eta_p^2 = .09$. Ratings of other emotions did not differ significantly between conditions, Fs < 3.52.

Time perception. To test the hypothesis that awe expands time perceptions, we conducted an analysis of variance (ANOVA) on the perceived-time-availability index, which revealed the predicted effect of emotion condition, $F(1, 61) = 7.44$, $p = .01$, $\eta_p^2 = .11$. Participants in the awe condition ($M = 3.38$, $SD = 1.49$) perceived time as more plentiful than did participants in the happiness condition ($M = 2.44$, $SD = 1.20$). Correlational analyses supported this effect by showing that, across conditions, stronger feelings of awe were associated with greater perceived time availability, $r = .36$, $p < .01$.

Discussion. Thus, awe, relative to happiness, led to the perception that time is more plentiful and expansive. Experiment 1 also demonstrated that the time-expansion effect associated with the experience of awe is not simply due to the positive valence of this emotion, as participants induced to feel a different positive emotion—happiness—perceived time as more constricted than did participants induced to feel awe. It is important to note that the predicted effect emerged even after we primed participants with the idea of time being constricted, as this reduces concern about the possibility of a natural confound between a lack of time pressure and the experience of awe.

Experiment 2

Experiment 1 showed that awe can make people perceive time as more plentiful than they do when experiencing another positively valenced emotion, happiness. Experiment 2 was designed to provide further evidence of this time-expansion effect, but for convergent validity, we used a different measure of perceived time availability. The perception that one has too many things to do in the time available can elicit impatience (Lang & Markowitz, 1986) and impatient behavior (Darley & Batson, 1973). Therefore, we predicted that participants who experienced awe (vs. happiness) would feel less impatient because impatience arises in response to the feeling that the amount of available time is inadequate.

Experiment 2 also assessed whether awe can alter prosocial decisions that exact a temporal cost. We tested the hypothesis that awe, by altering time perception, would increase people's willingness to volunteer their time. To test the specificity of our account, we also examined whether awe alters people's willingness to behave prosocially in a manner not involving time. Specifically, we tested awe's effects on monetary donations. Because our theory centered on awe's ability to alter perceptions of time, not prosociality, we expected that awe would not affect participants' willingness to donate money.

A final objective was to examine different types of awe-eliciting events and to analyze their relationship to time perception. We predicted that the feeling of awe, not the type of event that elicited it, would be what shifted participants' perception of how much time was available. Therefore, in Experiment 2, we used a different method of manipulating felt emotion: Participants wrote narratives about an emotion-eliciting personal experience.

Method

Participants. Eighty-six students (53 women, 33 men) participated for $20.

Procedure. To provide a cover story, we told participants that they would complete several unrelated surveys. In the first survey, to manipulate felt emotion, we asked participants to write a narrative about a personal experience during which they felt either awe or happiness, depending on the condition to which they were randomly assigned. Participants in the awe condition read that awe is "a response to things perceived as vast and overwhelming that alters the way you understand the world" and wrote about an experience that made them feel awe. Participants in the happiness condition read that happiness is feeling "contentment or joy" and wrote about an experience that made them feel happy.

In the second survey, participants answered filler items and then reported their feelings of impatience (1 = *not at all*, 7 = *extremely*). In the third, and final, survey, four items assessed how likely and willing participants were to volunteer time and donate money to "support a worthy cause" and "help a charity" (1 = *not at all*, 7 = *very*; "How willing are you to donate your money to support a worthy cause?"; "How willing are you to volunteer your time to support a worthy cause?"; "How likely are you to donate your money to help a charity?"; "How likely are you to volunteer your time to help a charity?"). Responses to the time-donation items and the money-donation items were averaged separately (donate time: $\alpha = .94$; donate money: $\alpha = .94$) to create two willingness-to-give indices. Last, for our manipulation checks, in this final survey we also had participants report the degree to which they were currently feeling "excitement," "awe," "pride," and "happiness" (1 = *not at all*, 7 = *very much*).

Results and discussion

Manipulation checks. Emotion reports confirmed that participants in the awe condition ($M = 4.24$, $SD = 2.06$) experienced stronger feelings of awe during the experiment than did participants in the happiness condition ($M = 2.93$, $SD = 1.74$), $F(1, 84) = 10.12$, $p < .01$, $\eta_p^2 = .12$. Also, participants in the happiness condition ($M = 4.95$, $SD = 1.26$) experienced stronger feelings of happiness than did participants in the awe condition ($M = 4.12$, $SD = 1.45$), $F(1, 84) = 8.17$, $p < .01$, $\eta_p^2 = .09$. Ratings of other emotions did not differ between conditions, Fs < 1.75.

Impatience. We used an ANOVA to test the hypothesis that awe reduces impatience. As predicted, participants in the awe condition ($M = 3.90$, $SD = 1.57$) reported feeling less impatient than did participants in the happiness condition ($M = 4.64$, $SD = 1.48$), $F(1, 84) = 4.93$, $p = .03$, $\eta_p^2 = .06$.

To determine whether awe-eliciting events were associated with less time pressure than happiness-eliciting events and whether the type of recalled event influenced temporal perception, we asked two judges to code the events described in participants' narratives. The coders rated the time pressure associated with each event (1 = *none at all*, 9 = *an extreme amount*; intraclass correlation coefficient for interrater reliability, r, was .92). Using a non–mutually exclusive system developed by Shiota et al. (2007; 0 = no, 1 = yes), the coders also rated whether the narrative described each of five categories of events: being in nature, exposure to art or music, personal accomplishments, other people's accomplishments, and social interactions. Ninety-eight percent of participants described an experience that fit into one or more categories (interrater reliability for all category ratings: κs > .90, ps < .01).

Were awe-eliciting situations merely characterized by less time pressure than happiness-eliciting situations? An ANOVA on time-pressure ratings suggests otherwise: There were no significant differences in the time pressure associated with awe narratives ($M = 1.21$, $SD = 0.68$) compared with happiness narratives ($M = 1.18$, $SD = 0.66$), $F(1, 84) = 0.05$.

We then assessed whether certain types of emotion-eliciting experiences were differentially related to time perception within and across the awe and happiness conditions. Correlational analyses between ratings of impatience and scores for each of the five event categories revealed no significant correlations within the awe condition (rs < |.12|, ps > .43); that is, the type of awe experience recalled was not a correlate of time perception. Similar null effects were found within the happiness condition (rs < |.17|, ps > .27) and across both conditions (rs < |.16|, ps > .14). In short, the effect of condition on time perception seemed not to be driven by any differences in the types of events recalled by participants in the two emotion conditions.

Willingness to give time and money. To test whether awe alters prosocial decisions involving time, we conducted an ANOVA on the willingness-to-give-time index. Results revealed the predicted effect of condition, $F(1, 84) = 6.16$, $p = .02$, $\eta_p^2 = .07$. Participants in the awe condition ($M = 5.43$, $SD = 1.23$) reported greater willingness to volunteer their time than did participants in the happiness condition ($M = 4.77$, $SD = 1.22$). To assess whether awe affected non-time-related forms of prosociality, we conducted an ANOVA on the willingness-to-give-money index. Supporting our time-expansion account, the results showed that participants in the awe condition ($M = 4.71$, $SD = 1.35$) were no more willing to donate money than were participants in the happiness condition ($M = 4.63$, $SD = 1.12$), $F < 1$.

Last, to test the process by which awe influences willingness to donate time, we conducted a mediation analysis with impatience as the mediator (Baron & Kenny, 1986). Condition (happiness = 0, awe = 1) was a significant predictor of impatience, $b = -0.73$, $p = .03$, and of the willingness-to-give-time index, $b = 0.66$, $p = .02$. Impatience was negatively correlated with the willingness-to-give-time index, $r = -.33$, $p < .01$. Results supported mediation: When condition and impatience ratings were entered as simultaneous predictors of the willingness-to-give-time index, impatience remained a significant predictor, $b = -0.34$, $p < .01$, whereas the effect of condition became nonsignificant, $b = 0.41$, $p = .10$, Sobel $z = 1.97$, $p = .05$.

Discussion. Experiment 2 showed that the temporal consequences of awe are evident in reduced impatience and increased willingness to volunteer one's time—a prosocial benefit of awe. Awe did not, however, make people more generous in general, as it had no measurable impact on willingness to donate money. Furthermore, a mediation analysis demonstrated that awe's effect on willingness to give time to help other people was driven by reduced impatience.

Experiment 3

Experiments 1 and 2 showed that awe, relative to happiness, increases the perception that time is plentiful, reduces impatience, and inspires a greater desire to volunteer time. These outcomes have been related to well-being (Robinson & Godbey, 1997; Roxburgh, 2004), which suggests that life satisfaction itself might be increased by awe. Experiment 3 tested this hypothesis and also examined the prediction that awe, by influencing perceived time availability, would alter decision making. Although experiences deliver more psychological benefits than material possessions, they are temporally costlier (Cooper-Martin, 1991; Van Boven & Gilovich, 2003). Because of awe's ability to expand perceptions of time, we predicted that feeling awe would cause participants to choose more experiential, as opposed to material, goods. For convergent validity, this experiment used a different comparison condition and a different procedure for eliciting awe than did the previous two experiments.

Method

Participants. One hundred five members of a nationwide panel (60 women, 45 men) participated for $10.

Procedure. To provide a cover story, we told participants they would be completing several unrelated surveys. In the first survey, participants were instructed to read a short story and to try to feel as the character in the story would have felt (Griskevicius, Shiota, & Neufeld, 2010). We randomly assigned participants to either the awe condition or a neutral condition. Participants in the awe condition read a story about ascending the Eiffel Tower and seeing Paris from on high. Participants in the neutral condition read about ascending an unnamed tower and seeing a plain landscape from on high. To guard against demand effects, we did not use the word *awe* in either story.

The second survey included filler items and then a perceived-time-availability index ("I have lots of time in which I can get things done," "Time is slipping away" (reverse-scored), "Time is expanded," and "Time is boundless"; 1 = *strongly disagree/not at all*, 7 = *strongly agree/very much*; α = .76). The third, and final, survey included a measure of momentary life satisfaction ("All things considered, how satisfied are you with your life as a whole, right now?"; 1 = *not at all satisfied with life*, 7 = *extremely satisfied with life*; cf. Kahneman, Krueger, Schkade, Schwarz, & Stone, 2006). In this survey, participants also made hypothetical choices between experiential and material goods (said to be equivalent in price). Participants chose between a watch and Broadway show tickets, between a $10 gas card and a $10 movie-theater pass, between a jacket and a restaurant dinner, between a scientific calculator and a professional massage, and between a $50 backpack and a $50 iTunes card. Last, participants reported their current feelings of "calmness," "anxiety," "relaxation," "worry," "awe," "sadness," "boredom," and "fear" (1 = *not at all*, 7 = *very much*).

Results and discussion

Manipulation checks. Emotion ratings confirmed that participants in the awe condition (M = 2.98, SD = 2.01) experienced stronger feelings of awe than did participants in the neutral condition (M = 2.25, SD = 1.40), $F(1, 103) = 4.65$, $p = .03$, $\eta_p^2 = .04$. Ratings of other emotions did not differ between conditions, Fs < 1.95.

Time perception. Testing whether awe expands time perceptions, an ANOVA on the perceived-time-availability index revealed the predicted condition effect, $F(1, 103) = 8.45$, $p < .01$, $\eta_p^2 = .08$. Participants in the awe condition (M = 3.83, SD = 1.38) perceived time as more plentiful than did participants in the neutral condition (M = 3.09, SD = 1.22).

Experiential- versus material-product choices. To test whether awe influences decision making, we calculated the percentage of experiential products chosen by each participant (cf. Van Boven & Gilovich, 2003). As predicted, an ANOVA revealed that participants in the awe condition (M = 65.66%, SD = 25.83) favored experiential products more than participants in the neutral condition did (M = 54.23%, SD = 26.37), $F(1, 103) = 5.03$, $p = .03$, $\eta_p^2 = .05$.

To test how awe influences decisions to choose experiential (vs. material) goods, we conducted a mediation analysis with perceived time availability as the mediator (Baron & Kenny, 1986). Condition (neutral = 0, awe = 1) predicted perceived time availability, $b = 0.74$, $p < .01$, and percentage of experiential products selected, $b = 11.43$, $p = .03$. Perceived time availability and percentage of experiential products chosen were positively correlated, $r = .30$, $p < .01$. When condition and perceived time availability were included as simultaneous predictors of experiential choices, perceived time availability remained a significant predictor, $b = 5.08$, $p = .01$, whereas the effect of condition became nonsignificant, $b = 7.67$, $p = .14$, Sobel $z = 1.96$, $p = .05$. Thus, the results of this analysis supported mediation.

Life satisfaction. To test the hypothesis that awe would affect momentary life-satisfaction ratings, we performed an ANOVA, which revealed the predicted condition effect, $F(1, 103) = 6.97$, $p = .01$, $\eta_p^2 = .06$. Participants in the awe condition (M = 5.42, SD = 1.28) reported greater momentary life satisfaction

than did participants in the neutral condition ($M = 4.65$, $SD = 1.66$).

Last, we conducted a mediation analysis to examine how awe affects life-satisfaction ratings. Condition (neutral = 0, awe = 1) predicted perceived time availability, $b = 0.74$, $p < .01$, and life satisfaction, $b = 0.76$, $p = .01$. Perceived time availability was positively correlated with life satisfaction, $r = .34$, $p < .01$. When condition and perceived time availability were simultaneously included in the model, perceived time availability remained a significant predictor of life satisfaction, $b = 0.33$, $p < .01$, whereas the effect of condition became nonsignificant, $b = 0.52$, $p = .08$, Sobel $z = 2.11$, $p = .03$. Thus, the results supported the hypothesis that perceived time availability mediates the relationship between awe and life satisfaction.

Discussion. Experiment 3 provided further evidence that awe expands perceptions of time. Eliciting a feeling of awe, compared with a neutral state, increased perceived time availability, which in turn led participants to more strongly prefer experiential goods over material ones and to view their lives as more satisfying. Experiment 3 also found evidence of mediation: Greater perceived time availability mediated awe's effect on momentary life satisfaction and participants' choice of experiential over material products.

General Discussion

People increasingly report feeling time starved, and that feeling exacts a toll on health and well-being (Menzies, 2005). Drawing on research showing that being in the present moment elongates time perception (Vohs & Schmeichel, 2003), we predicted and found that experiencing awe, relative to other states, caused people to perceive that they had more time available (Experiments 1 and 3) and lessened impatience (Experiment 2). Furthermore, by expanding time perception, awe, compared with other states, led participants to more strongly desire to spend time helping other people (Experiment 2) and to partake in experiential goods over material ones (Experiments 3). A small dose of awe even gave participants a momentary boost in life satisfaction (Experiment 3). Thus, these results not only have implications for how people spend their time, but also underscore the importance and promise of cultivating awe in everyday life.

That awe expands time perception suggests that it could also amplify the savoring of pleasurable moments (Quoidbach et al., 2010) or reduce aggressive and distracted driving (Nationwide Mutual Insurance Company, 2008). Furthermore, awe's complexity suggests that it might have multifaceted effects that are not wholly positive. For instance, being stuck in the present moment can cause people to fail at self-regulation (Vohs & Schmeichel, 2003), and this finding hints at a potential downside of awe. We look forward to future research that continues the examination of how experiences of awe produce changes in people's perception and behaviors and how such effects are distinct from those of other discrete positive emotions.

In summary, awe offset the feeling that time is limited, and this increase in perceived time availability heightened willingness to volunteer time, accentuated preferences for experiential goods, and lifted satisfaction with life. Our studies also demonstrated that awe can be elicited by reliving a memory, reading a brief story, or even watching a 60-s commercial. Therefore, awe-eliciting experiences might offer one effective way of alleviating the feeling of time starvation that plagues so many people in modern life.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

References

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182.

Carroll, J. (2008). *Time pressures, stress common for Americans*. Retrieved from http://www.gallup.com/poll/103456/Time-Pressures-Stress-Common-Americans.aspx

Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, *54*, 165–181.

Cooper-Martin, E. (1991). Consumers and movies: Some findings on experiential products. *Advances in Consumer Research*, *18*, 372–378.

Csikszentmihalyi, M., & Hunter, J. (2003). Happiness in everyday life: The uses of experience sampling. *Journal of Happiness Studies*, *4*, 185–199.

Darian, J. C., & Cohen, J. (1995). Segmenting by consumer time shortage. *Journal of Consumer Marketing*, *12*, 32–44.

Darley, J. M., & Batson, C. D. (1973). From Jerusalem to Jericho: A study of situational and dispositional variables in helping behavior. *Journal of Personality and Social Psychology*, *27*, 100–108.

Ekman, P. (1992). An argument for basic emotions. *Cognition & Emotion*, *6*, 169–200.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, *56*, 218–226.

Fredrickson, L. M., & Anderson, D. H. (1999). A qualitative exploration of the wilderness experience as a source of spiritual inspiration. *Journal of Environmental Psychology*, *19*, 21–39.

Griskevicius, V., Shiota, M. N., & Neufeld, S. (2010). Influence of different positive emotions on persuasion processing: A functional evolutionary approach. *Emotion*, *10*, 190–206.

Kahneman, D., Krueger, A. B., Schkade, D., Schwarz, N., & Stone, A. A. (2006). Would you be happier if you were richer? A focusing illusion. *Science*, *312*, 1908–1910.

Keltner, D., & Haidt, J. (2003). Approaching awe, a moral, spiritual, and aesthetic emotion. *Cognition & Emotion*, *17*, 297–314.

Kivimäki, M., Kalimo, R., & Julkunen, J. (1996). Components of Type A behavior pattern and occupational stressor-strain relationship: Testing different models in a sample of industrial managers. *Behavioral Medicine*, *22*, 67–76.

Lang, D., & Markowitz, M. (1986). Coping, individual differences, and strain: A longitudinal study of short-term role overload. *Journal of Occupational Behavior*, *7*, 195–206.

Lehto, A. (1998). Time pressure as a stress factor. *Society and Leisure*, *21*, 491–511.

Mannell, R. C., & Zuzanek, J. (1991). The nature and variability of leisure constraints in daily life: The case of the physically active leisure of older adults. *Leisure Sciences*, *13*, 337–351.

Maslow, A. H. (1964). *Religions, values, and peak-experiences*. Columbus: Ohio State University Press.

Menzies, H. (2005). *No time: Stress and the crisis of modern life*. Vancouver, British Columbia, Canada: Douglas & McIntyre.

Nationwide Mutual Insurance Company. (2008). *Driving while distracted public relations research*. Retrieved from http://www.nationwide.com/pdf/dwd-2008-survey-results.pdf

Neumark-Sztainer, D., Hannan, P. J., Story, M., Croll, J., & Perry, C. (2003). Family meal patterns: Associations with sociodemographic characteristics and improved dietary intake among adolescents. *Journal of the American Dietetic Association*, *103*, 317–322.

Perlow, L. (1999). The time famine: Toward a sociology of work time. *Administrative Science Quarterly*, *44*, 57–81.

Quoidbach, J., Dunn, E. W., Petrides, K. V., & Mikolajczak, M. (2010). Money giveth, money taketh away: The dual effect of wealth on happiness. *Psychological Science*, *21*, 759–763.

Ravizza, K. (1977). Peak experiences in sport. *Journal of Humanistic Psychology*, *17*, 35–40.

Robinson, J. P., & Godbey, G. (1997). *Time for life: The surprising ways Americans use their time*. University Park: Pennsylvania State University Press.

Roxburgh, S. (2004). There just aren't enough hours in the day: The mental consequences of time pressure. *Journal of Health and Social Behavior*, *45*, 115–131.

Shiota, M. N., Campos, B., & Keltner, D. (2003). The faces of positive emotion: Prototype displays of awe, amusement, and pride. *Annals of the New York Academy of Sciences*, *1000*, 296–299.

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

Spence, J. T., Helmreich, R. L., & Pred, R. S. (1987). Impatience versus achievement strivings in the Type A pattern: Differential effects on students' health and academic achievement. *Journal of Applied Psychology*, *72*, 522–528.

Srull, T. K., & Wyer, R. S. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology*, *37*, 1660–1672.

Strober, M. H., & Weinberg, C. B. (1980). Strategies used by working and nonworking wives to reduce time pressures. *Journal of Consumer Research*, *6*, 338–348.

Thoits, P. A., & Hewitt, L. N. (2001). Volunteer work and well-being. *Journal of Health and Social Behavior*, *42*, 15–31.

Van Boven, L., & Gilovich, T. (2003). To do or to have? That is the question. *Journal of Personality and Social Psychology*, *85*, 1193–1202.

Vohs, K. D., & Schmeichel, B. J. (2003). Self-regulation and the extended now: Controlling the self alters the subjective experience of time. *Journal of Personality and Social Psychology*, *85*, 217–230.

Vuckovic, N. (1999). Fast relief: Buying time with medications. *Medical Anthropology Quarterly*, *13*, 51–68.

Yan, L. L., Liu, K., Matthews, K. A., Daviglus, M. L., Ferguson, T. F., & Kiefe, C. I. (2003). Psychosocial factors and risk of hypertension. *Journal of the American Medical Association*, *290*, 2138–2148.

Zhong, C.-B., & DeVoe, S. (2010). You are how you eat: Fast food and impatience. *Psychological Science*, *21*, 619–623.

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.