

**Inspired to Create:**

**Awe Enhances Openness to Learning and the Desire for Experiential Creation**

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**Abstract**

Automated fabrication, home services, and premade goods pervade the modern consumer landscape. Against this backdrop, this research explored how an emotion—awe—could motivate consumers to instead partake in experiential creation (i.e., activities wherein one actively produces an outcome) by enhancing their willingness to learn. Across eight experiments, experiencing awe (vs. happiness, excitement, pride, amusement, and/or neutrality) increased people's likelihood of choosing an experiential creation gift (vs. one not involving experiential creation), willingness to pay for experiential creation products (vs. comparable ready-made products), likelihood of creating a bespoke snack (vs. taking a premade one), preference for experiential creation solutions (vs. solutions without experiential creation), likelihood of purchasing a product when it was framed as high (vs. low) in experiential creation, preference for high (vs. low) experiential creation meals, and likelihood of creating a knickknack (vs. taking a premade one). This greater desire for experiential creation was mediated by openness to learning and moderated by need for closure. These findings, relevant for firms encouraging creation-oriented products and behaviors, offer fresh insights on engaging consumers.

Keywords: experiential creation, learning, awe, emotions

Compared to the rest of human history, most people today have it fairly easy. They do not have to know how to grow their own food, build a fire, or craft a dwelling out of whatever is available from the land. It is against this backdrop that we embarked upon studies of when people choose to actively create (instead of favoring premade products or activities that do not require self-creation). Understanding when and why consumers engage in experiential creation can bring great benefits to firms and even undergirds entire industries. For instance, the appeal of self-designed products (Moreau and Herd 2010), consumer generation of new product ideas (Chang and Taylor 2016), and the profitability of do-it-yourself industries (Tratensek and Jensen 2006) are but a few outcomes affected by consumers' desire to create. The desire to create also impacts consumers' decisions to perform everyday creation behaviors (e.g., cooking, automotive repair, and home improvement) and purchasing in a wide range of product categories (e.g., how-to guides, crafts, and items requiring assembly). Thus, a pivotal question is, how can consumers' desire for experiential creation be enhanced? We propose that evoking awe is one answer.

Awe is a distinctly human experience. It involves encountering something so strikingly vast that the experience cannot be accounted for by one's current understanding of the world. Along with this jarring of schemas comes another hallmark feature of experiencing awe—a need to alter, jettison, or otherwise revise one's existing knowledge (Keltner and Haidt 2003). In the current work, we proposed that this unique experience of awe is followed by a boost in the desire to embrace products, solutions, and activities that involve experiential creation.

Eight experiments tested the hypothesis that eliciting awe (vs. other positive emotions or neutral states) would enhance consumers' desires, preferences, and choices related to experiential creation. Through both mediation and moderation, these experiments also provided evidence of the underlying mechanism, demonstrating that awe boosts consumers' desire for experiential

creation by helping them overcome a crucial barrier: a tepid motivation to learn and acquire knowledge. Although people possess an intrinsic drive to learn and explore that is present from birth (Harter 1978), this drive is easily disrupted (Ryan and Deci 2000). Everyday distractions, resource constraints, and regulatory demands can turn curious consumers into cognitive misers and shortcut-driven creatures of habit (Fiske and Taylor 1984; Wood and Neal 2009). Our work linked this drive to acquire knowledge to experiential creation: We expected and found that awe's ability to shake consumers' confidence in their existing mental structures (Keltner and Haidt 2003) opens them up to the prospect of learning, thereby fueling their desire for experiential creation.

The empirical findings and theoretical positions of the present research advance the field's understandings of learning, emotions, and experiential creation. Our work identifies a novel, malleable factor capable of influencing consumers' openness to learning, and shines a light on a neglected emotion—awe—in the marketing literature. Moreover, our research answers calls for more studies of experiential creation (Dahl and Moreau 2007; Holbrook et al. 1984). Prior work largely has focused on outcomes of experiential creation, such as creative ability (Burroughs and Mick 2004; Dahl and Moreau 2002; Mehta, Zhu, and Cheema 2012; Moreau and Dahl 2005), enjoyment of creative tasks (Dahl and Moreau 2007), and consumers' perceptions of their creations (Norton, Mochon, and Ariely 2012). Our research builds on this work by pivoting to reveal a key antecedent of experiential creation—how awe inspires the desire to create.

#### *AWE FOSTERS OPENNESS TO LEARNING AND NEW KNOWLEDGE*

Awe is a common feature of firms' consumer-focused endeavors. Indeed, attempts to evoke awe can be seen in advertising campaigns (e.g., Samsung's "Dedicated to Wonder")

campaign and Palace Resorts' "Live in Awe" campaign) and in-store environments (e.g., Apple's flagship stores; Kozinets et al. 2004). Empirical examinations of awe's implications for consumer behavior, however, are nascent (Berger and Milkman 2012; Griskevicius, Shiota, and Neufeld 2010; Rudd, Vohs, and Aaker 2012).

Awe has generally been classified as a distinct positive emotion (Griskevicius et al. 2010; Rudd et al. 2012; Shiota, Campos, and Keltner 2003; Shiota, Keltner, & Mossman, 2007; Valdesolo and Graham 2014). Although awe has been described as having the potential to be "both profoundly positive and terrifyingly negative" (Keltner and Haidt 2003, p. 303) with recent studies identifying a negative, threat-based variant of awe (Gordon et al. 2017), these studies also found support for the notion that awe is almost entirely positive in nature. In the present research, we thus limited our focus to positive awe, the predominant variant. We also conceptualized awe as having two defining features (Keltner and Haidt 2003). First, awe involves perceptual vastness, which refers to the sense that one has encountered something immense in size, number, scope, complexity, ability, or social bearing (e.g., fame or authority). Second, awe prompts a need for accommodation, meaning awe experiences are difficult to grasp and provoke the sense that one's existing knowledge and mental structures are insufficient or inaccurate. This second theoretical theme is especially germane to our investigation, as it alludes to the possibility that awe might enhance people's openness to learning and is consistent with early theoretical writings that associated the feeling of wonder with the human instinct to be curious (McDougall 1908).

Accommodation refers to the processes that occur when people detect a discrepancy between an encountered stimulus and their existing mental schemas or knowledge, and must consequently revise or create new schemas in order to account for the discrepancy (Fiedler 2001; Keltner and Haidt 2003; Piaget 1970). Thus, accommodation involves the destruction or revision

of old mental structures and formation of new ones in their place. Although the notion that awe facilitates accommodation (Griskevicius et al. 2010; Keltner and Haidt 2003; Shiota et al. 2007) is aligned with the established concept that emotions can influence cognition (Isen 2000), it also sets awe apart from other positive emotions. That is to say, positive affective states (like happiness) generally facilitate knowledge-driven processing (i.e., reliance on prior knowledge and assimilation of stimuli into existing schemas) rather than accommodative processing (Bless et al. 1996; Bodenhausen, Kramer, and Süsser 1994; Fiedler 2001; Forgas 1998). But because awe is commonly experienced when one has the opportunity to build informational resources, awe instead encourages cognitive accommodation (vs. assimilation; Shiota et al 2007). Hence, building upon the idea that the evolutionary function of awe is to generate a need for accommodative processing (Griskevicius et al. 2010; Keltner and Haidt 2003)—a need people are generally motivated to satisfy (Fiedler 2001)—we hypothesized:

**H1:** The experience of awe will increase people’s openness to learning.

### *EXPERIENTIAL CREATION AND AWE*

What is experiential creation? Broadly defined, experiential creation refers to “the universe of activities in which a consumer actively produces an outcome” (Dahl and Moreau 2007, p. 358). This definition allows for a continuum of experiential creation (Dahl and Moreau 2007)—one that encompasses both activities with no target outcome that require improvisation (e.g., painting an original piece of art) and activities with fixed target outcomes that discourage improvisation (e.g., completing a paint-by-numbers kit), as well as both activities involving no instructions (e.g., invention) and activities with detailed instructions (e.g., home repair using a

how-to guide). In this research, we expound upon the aforesaid definition of experiential creation to more clearly delineate what is and is not classified as experiential creation.

First, we underscore the creation component of the experiential creation construct by clarifying that it refers to the physical act of making or creating (i.e., bringing something into existence). Thus, sketching an architectural drawing would be classified as experiential creation, whereas merely imagining a new architectural structure would not. Second, we emphasize the experiential component of experiential creation by clarifying that the consumer must play a direct, active (vs. an indirect, passive) role in creating (i.e., consumers must see themselves as an agent of the creation experience vs. a passive bystander). For instance, if a consumer walked up to a machine, pressed a button, and the machine set about making and baking a pie, this would not be classified as experiential creation. In contrast, if a consumer made a pie by hand—even if following a recipe in a cookbook—that would be classified as experiential creation.

Though creation activities have existed for perhaps as long as humans have been on earth (Joordens et al. 2015), experiential creation industries have undergone especially dramatic growth in the past few decades, becoming among the economy's fastest-rising sectors (Tratensek and Jensen 2006). Just as these industries have blossomed, so too has experiential creation research. Within this literature, the predominant focus has been on how to affect creative outcomes (e.g., creative performance or people's valuations of their creations; Burroughs et al. 2011; Burroughs and Mick 2004; Dahl and Moreau 2002; Mehta et al. 2012; Moreau and Dahl 2005; Norton et al. 2012). Other work, however, has sought to understand what motivates people to create.

Though this latter research has largely looked at how consumers' needs for competence or autonomy might stimulate the undertaking of creation-oriented tasks (Dahl and Moreau 2007; Moreau and Herd 2010; Mochon et al. 2012; Watson and Shove 2008), ancillary findings suggest

that learning may also be an important incentive. For instance, in a qualitative study wherein Dahl and Moreau (2007) interviewed hobbyists, it emerged that learning was one of the basic motivations driving people's participation in experiential creation. Such findings are of particular interest to our research, as they suggest that if awe is indeed able to enhance people's openness to learning (as we predicted), then it could fuel their desire to partake in experiential creation. Further support for the notion that consumers view experiential creation activities as learning opportunities can be found in industry research and research on human learning and development. For instance, the Craft and Hobby Association (2010) recently identified "I like to learn new things" as one of the top drivers of crafting behaviors. Moreover, research has shown that, beginning in infancy (Piaget 1964) and continuing, in some form, throughout life (Kendall and Sproles 1986; Kolb, Boyatzis, and Mainemelis 2000), behaviors like play, making, and touching—which are all common elements of experiential creation—are some of the most basic, primal ways that humans learn. Therefore, building upon both research that suggests people view experiential creation as involving (i.e., requiring or resulting in) learning and our prediction that the experience of awe will promote greater openness to learning, we hypothesized:

**H2a:** The experience of awe will increase people's desire for experiential creation.

**H2b:** The effect of awe on people's desire to partake in experiential creation will be mediated by openness to learning.

### *THE MODERATING ROLE OF NEED FOR CLOSURE*

If, as we predict, openness to learning indeed drives the effect of awe on the desire for experiential creation, then not all people at all times should react to awe with the same desire to



create. Namely, awe's effect on experiential creation desires is likely to be stronger when awe's ability to stimulate a thirst for knowledge is amplified. In the current research, we focused on the moderating role of people's dispositional need for closure, as this need has been shown to influence the extent to which people seek or shun new knowledge (Kruglanski 1990).

Need for closure is defined as an aversion to, and urge to decisively resolve, feelings of ambiguity or confusion (Kruglanski 1990). With regard to how need for closure affects people's motivation to learn and acquire knowledge, prior work has shown that this effect is sometimes positive and sometimes negative: Though high (vs. low) need for closure increases reluctance to search for or consider new information in some situations (Klein and Webster 2000; Kruglanski and Mayseless 1988), it also makes people less reluctant and more open to learning under other conditions. Of special interest to our work is the finding that, when people high (vs. low) in need for closure are faced with confusion or lack confidence in their existing mental structures (i.e., when their sense of closure is shaken), they become highly motivated to extensively search for information and "covet" knowledge (Kruglanski 1988, p. 122; Kruglanski, Webster, and Klem 1993). Simply put, situations that make people high (vs. low) in need for closure feel uncertain about their current knowledge spark within them a need to resolve that feeling and regain a sense of closure (Kruglanski 1988)—and this need has implications for their openness learning. Indeed, under conditions of uncertainty, people high (vs. low) in need for closure exhibit increased consideration of alternatives, acceptance of persuasive messages, and information processing and search—all signs of greater openness to learning (Kruglanski, Peri, and Zakai 1991; Kruglanski et al. 1993; Van Hiel and Mervielde 2002; Vermeir, Van Kenhove, and Hendrickx 2002).

Given that awe is theorized to elicit a need for accommodation and shake people's certainty in their existing mental structures (Keltner and Haidt 2003), and that people high (vs.

low) in need for closure are more motivated to resolve such feelings of uncertainty and to do so by coveting knowledge (Kruglanski et al. 1991, Kruglanski et al. 1993; Van Hiel and Mervielde 2002; Vermeir et al. 2002), we expected that need for closure would play a moderating role in our conceptual model. Building upon this prior research, our theoretical model predicts that people high (vs. low) in need for closure should respond to awe with a greater openness to learn and thus a greater eagerness to engage in experiential creation (in hopes of satisfying the need for accommodation elicited by awe). In sum, we hypothesized a first-stage moderated mediation:

**H3:** The experience of awe will increase people’s openness to learning and, consequently, increase their desire for experiential creation if they have a high need for closure, but this mediational effect will be attenuated (such that experiencing awe will not increase openness to learning) if they have a low need for closure.

### *THE PRESENT RESEARCH*

Eight experiments tested whether experiencing awe increases the desire to partake in experiential creation. As predicted, participants who experienced awe (vs. happiness, excitement, pride, amusement, and/or a neutral state) were more likely to choose an experiential creation gift for an upcoming holiday (experiment 1), were willing to pay more for experiential creation products (follow-up experiment A), were more likely to create their own trail-mix (experiment 2), more frequently chose to use experiential creation solutions to solve problems (experiment 3), reported a greater purchase likelihood when a product was framed as high (but not low) in experiential creation (experiment 4), exhibited stronger preferences for meals high in experiential creation (follow-up experiments B and C), and were more likely to make their own coaster

(experiment 5). This effect was shown to be mediated by openness to learning (experiments 2-5 and follow-up experiments B and C) and moderated by need for closure (experiment 5).

### *EXPERIMENT 1*

Experiment 1 was an initial test of our hypothesis that awe can increase people's desire to partake in experiential creation. We conducted experiment 1 in late January, an ideal time to test if people induced to feel awe would be more interested in giving a gift of handmade chocolates (an experiential creation gift) or store-bought chocolates (a gift that does not involve experiential creation) during the upcoming Valentine's Day. Experiment 1 also used two comparison conditions: a neutral state (to test if awe raises experiential creation desire above a baseline) and a happiness condition (to test if awe's effect is simply characteristic of all positive emotions).

#### *Participants and Procedure*

One hundred and sixty-five individuals on Amazon's Mechanical Turk (50% female;  $M_{\text{Age}} = 34.70$ ;  $SD_{\text{Age}} = 11.79$ ) completed the study in exchange for \$1. The experiment used a 3 cell (Emotion: Awe vs. Happiness vs. Neutral) between-subjects design.

As a cover story, we told participants they would complete several unrelated surveys. In the first survey, we manipulated emotions by randomly assigning participants to watch an awe-eliciting, happiness-eliciting, or neutral 60 second commercial for an LCD television (Rudd et al. 2012). All commercials advertised the same brand and had no dialog. The awe-eliciting commercial depicted people in city streets and parks encountering vast, mentally overwhelming, and realistic-looking images of things such as waterfalls, whales, and astronauts in space. The happiness-eliciting commercial depicted people in city streets and parks encountering rainbow

confetti falling through the air and a parade of smiling, cheerful people waving flags and wearing colorful outfits and face paint. The neutral commercial depicted several features of the television and showed it from various angles. Afterwards, participants reported how much they liked the commercial [1 = *not at all*, 7 = *very much*] and answered filler questions about television brands.

In a second survey, participants responded to filler questions about Valentine's Day and then to a measure of experiential creation desire. Specifically, we told them that, as thanks for participating, they could pick one of two options: "Receive a recipe for Valentine's Day chocolates that you can make and give to a loved one on Valentine's Day" or "Receive a coupon for a discount on premade Valentine's Day chocolates that you can buy and have delivered to a loved one on Valentine's Day." We told them that their "loved one may be a significant other, friend, family member, or crush." After making their decision (0 = *get chocolates*; 1 = *make chocolates*), those who chose "get chocolates" received a real discount coupon for buying chocolates and those who chose "make chocolates" received a real recipe for making chocolates. Last, they reported their current emotions ("sadness," "fear," "pride," "awe," "peacefulness," "excitement," "happiness," and "boredom"; 1 = *not at all*; 7 = *extremely*).

### *Results and Discussion*

*Manipulation checks.* We conducted one-way analyses of variance (ANOVAs) on the emotion items. They confirmed ( $F(2, 162) = 27.71, p < .01, \eta_p^2 = .26$ ) that participants in the awe condition ( $M = 3.71, SD = 1.80$ ) reported experiencing stronger feelings of awe during the experiment than did those in the happiness condition ( $M = 1.56, SD = 1.45; t(162) = 7.05, p < .01$ ) or the neutral condition ( $M = 1.98, SD = 1.60; t(162) = 5.55, p < .01$ ). The happiness and neutral conditions did not significantly differ in their feelings of awe ( $t(162) = 1.35, p = .18$ ). Also supporting the effectiveness of the manipulation ( $F(2, 162) = 7.34, p < .01, \eta_p^2 = .08$ ),

participants in the happiness condition ( $M = 4.89$ ,  $SD = 2.02$ ) reported experiencing stronger feelings of happiness during the experiment than did those in the awe condition ( $M = 3.55$ ,  $SD = 1.89$ ;  $t(162) = 3.63$ ,  $p < .01$ ) or the neutral condition ( $M = 3.83$ ,  $SD = 1.99$ ;  $t(162) = 2.84$ ,  $p = .01$ ). The awe and neutral conditions did not significantly differ in their feelings of happiness ( $t(162) = .72$ ,  $p = .47$ ). Moreover, neither ratings of the other emotions ( $ts < 1.63$ , NS) nor the extent participants liked the commercials ( $ts < .83$ , NS) significantly differed across conditions.

*Gift choice.* To test if awe altered experiential creation desires, we conducted a logistic regression on participants' gift choice. As predicted, we found that participants in the awe condition ( $M = 53.6\%$ ) chose the "make chocolates" option more often than did those in the happiness ( $M = 29.8\%$ ;  $\beta = 1.00$ ,  $\text{Exp}(B) = 2.72$ ,  $\text{Wald} = 6.41$ ,  $p = .01$ ) or neutral conditions ( $M = 32.7\%$ ;  $\beta = .87$ ,  $\text{Exp}(B) = 2.38$ ,  $\text{Wald} = 4.70$ ,  $p = .03$ ). The happiness and neutral conditions did not differ in likelihood of choosing to "make chocolates" ( $\beta = -.13$ ,  $\text{Wald} = .10$ ,  $p = .75$ ).

*Discussion.* Experiment 1 measured actual choice and found initial evidence that awe increases the desire to partake in experiential creation: Participants induced to feel awe (vs. a neutral state or happiness) more frequently chose a recipe for making Valentine's Day chocolates over a discount coupon for buying chocolates. Notably, awe's ability to increase experiential creation desires was not simply due to positive valence, as participants induced to feel a different positive emotion—happiness—chose the experiential creation option less often than did those induced to feel awe. Experiment 1 also showed that this effect was indeed due to awe increasing creation desires (and not due to happiness decreasing them), as participants in the awe condition also chose the experiential creation option more often than did those in the neutral condition.

We conducted a follow-up experiment (follow-up experiment A;  $N = 88$ ; see the Web Appendix) to conceptually replicate the findings of experiment 1 and provide a test of theory

specificity. For convergent validity, experiment A used a different method of inducing our target emotions: We manipulated emotions by randomly assigning participants to watch an awe-eliciting or happiness-eliciting slideshow. The slideshow images were of known elicitors of awe (e.g., galaxies, sunsets, mountain peaks, Earth from space, and waterfalls) or happiness (e.g., families, desserts, puppies, babies, and smiling couples; Mikels et al. 2005). Our key dependent variables were consumers' willingness to pay (WTP) for 8 products that involved experiential creation (e.g., furniture that required assembly and art supplies) and WTP for 8 comparable products that did not involve experiential creation (e.g., furniture that came preassembled and premade art). We predicted that awe (vs. happiness) would increase people's WTP for the experiential creation products, but not for the similar products that lacked experiential creation elements (because our theory specifically relates awe to experiential creation desires).

We conducted a 2 (between-subjects condition: awe vs. happiness) by 2 (within-subjects condition: product type) mixed-measures ANOVA to test our predictions. As expected, there was an interaction between emotion condition and product type ( $p < .01$ ): Participants in the awe (vs. happiness) condition were willing to pay significantly more for the experiential creation products ( $p < .01$ ), but were equally willing to pay for the not-experiential-creation products ( $p = .22$ ). Together, these results provided additional converging evidence for our theoretical model and the prediction that the experience of awe can increase people's desire for experiential creation.

## *EXPERIMENT 2*

The first objective of experiment 2 was to provide an initial test of the mechanism proposed to underlie awe's effect on experiential creation desire: openness to learning.

Specifically, we tested the predictions that awe would make people more open to the prospect of learning and that this greater openness to learning would, in turn, drive awe's ability to heighten experiential creation desires. The second objective was to manipulate awe and obtain evidence of the relationships among awe, openness to learning, and experiential creation desires in a real world, field setting using measures of actual behavior. Thus, we conducted experiment 2 in the field at a major hiking destination in the Swiss Alps. The third objective was to help rule out an alternative explanation for awe's ability to increase experiential creation desires. Because people's decisions to engage in experiential creation might involve considerations of how much time they have at their disposal and because awe can make people feel more time affluent (Rudd et al. 2012), one could argue that the effect of awe on people's desire for experiential creation is not due to a greater openness to learning (as predicted), but instead due to an altered perception of time. Experiment 2 addressed this alternative by measuring perceived time affluence.

#### *Participants and Procedure*

A total of 162 adults (51% female;  $M_{\text{Age}} = 47.51$ ;  $SD_{\text{Age}} = 18.60$ ) at a major hiking destination in Switzerland completed the study in exchange for a bag of trail mix. The study used a 2 cell (Awe: Mountain Top/High Awe vs. Mountain Bottom/Low Awe) between-subjects design. To test if exposure to a high-awe (vs. low-awe) inducing experience increases people's openness to learning and, in turn, their desire to create, research assistants (blind to our hypotheses) recruited hikers to complete a short survey at either the foot of the mountain near the parking lot and entrance to the mountain's cable car service (i.e., the mountain bottom condition) or the mountain summit near the end of the cable car line (i.e., the mountain top condition). We expected that the mountain bottom condition would elicit a relatively low amount of awe and serve as a neutral control, whereas the mountain top condition would elicit a high amount of awe.

The hikers first answered a filler question about how often they visit this destination, then reported their current experience of awe (“Right now, I’m experiencing a strong feeling of awe”; 1 = *strongly disagree*, 7 = *strongly agree*) and perceived time affluence (“I feel pressed for time” [reverse coded] and “Time is slipping away” [reverse coded]; 1 = *strongly disagree*, 7 = *strongly agree*; Rudd et al. 2012). At this point, we led participants to believe the study was finished and, as an ostensibly unrelated compensation, offered them a choice between taking a premade trail-mix assortment or creating their own assortment (we used the same ingredients—cranberries, dried apricots, hazelnuts, cashews, and raisins—for both the premade and self-made trail-mixes). The choice to take a premade trail-mix (coded as 0) or create one’s own trail-mix (coded as 1) was used as a behavioral measure of participants’ experiential creation desire. Also, sitting beside the trail-mixes was a stack of brochures. We told participants that these educational brochures contained information about the local hiking region and that they could take one if they wanted to learn more. Whether participants chose to take an educational brochure (coded as 1) or not (coded as 0) served as a behavioral measure of their openness to learning.

Importantly, the order in which we presented participants with the premade trail-mix, the ingredients they could use to make their own trail-mix, and the educational hiking brochures was counterbalanced across conditions and randomized every hour. Also, to rule out any potential effects that the time of data collection may have on consumers’ feeling of awe and their decision making, we collected the data during a single day (8 a.m. to 4 p.m.) and we randomized the two experimental conditions (i.e., mountain top vs. bottom) every two hours.

### *Results and Discussion*

*Manipulation check.* A one-way ANOVA was conducted on hikers’ current feeling of awe. As predicted, hikers in the mountain top condition ( $M = 4.92$ ,  $SD = 1.28$ ) reported



experiencing significantly greater awe than did hikers in the mountain bottom condition ( $M = 3.04$ ,  $SD = 1.45$ ;  $F(1,160) = 76.29$ ,  $p < .01$ ,  $\eta_p^2 = .32$ ). This result indicates that our naturalistic manipulation of awe was successful.

*Experiential creation desire.* To assess hikers' actual desire to create, we conducted a logistic regression on their choice to create their own trail-mix (vs. take premade trail-mix). In support of our prediction that experiencing stronger awe leads to a greater desire to partake in experiential creation, the results revealed that the hikers standing on the top of the mountain ( $M = 59.03\%$ ) were more likely to create their own trail-mix than were the hikers standing at the foot of the mountain ( $M = 24.05\%$ ;  $z(160) = 4.39$ ,  $\text{Exp}(B) = 4.55$ ,  $p < .01$ ). Notably, we neither found evidence for a main effect of time of day ( $\beta = .05$ ,  $z(158) = .76$ ,  $\text{Exp}(B) = 1.06$ ,  $p > .38$ ) nor a time of day by experimental condition interaction ( $\beta = .09$ ,  $z(158) = .46$ ,  $\text{Exp}(B) = 1.10$ ,  $p > .49$ ).

*Openness to learning.* To assess participants' openness to learning, we conducted a logistic regression on their choice to take (vs. not take) an educational hiking brochure. The results revealed that hikers at the top of the mountain ( $M = 39.76\%$ ) were more likely to take an educational brochure than were those at the bottom of the mountain ( $M = 25.32\%$ ;  $z(160) = 1.95$ ,  $\text{Exp}(B) = 1.95$ ,  $p = .05$ ). This finding supports our prediction that experiencing a stronger feeling of awe leads to a greater openness to and interest in learning.

*Perceived time affluence.* In line with prior work showing that awe can expand perceived time (Rudd et al. 2012), a one-way ANOVA revealed that participants in the mountain top condition ( $M = 5.57$ ,  $SD = .82$ ) felt more time affluent than did those in the mountain bottom condition ( $M = 5.23$ ,  $SD = 1.02$ ;  $F(1,160) = 5.41$ ,  $p < .05$ ,  $\eta_p^2 = .03$ ). Logistic regressions, however, showed that perceived time affluence neither affected people's decision to take an educational brochure ( $B = .11$ ,  $z(160) = .61$ ,  $\text{Exp}(B) = 1.12$ ,  $p = .54$ ) nor their decision to create

their own trail-mix ( $B = .25$ ,  $z(160) = 1.39$ ,  $\text{Exp}(B) = 1.29$ ,  $p = .16$ ). Thus, although participants in the mountain top (vs. bottom) condition felt more time affluent, this greater time affluence could not account for the aforementioned openness to learning and experiential creation findings.

*Mediation analysis.* To test our prediction that awe increases the desire to partake in experiential creation by increasing openness to learning, we conducted a mediation analysis with a bootstrapping package and binomial link function in R (10,000 resamples). Awe condition (0 = mountain bottom, 1 = mountain top) was the independent variable, the binary brochure choice (0 = did not take a brochure, 1 = took a brochure) was the mediator, the binary trail-mix choice (0 = took premade trail-mix, 1 = created trail-mix) was the dependent variable, and the perceived time affluence index was included as a covariate (to rule out time affluence as the true underlying mechanism). Mediations are significant if the interval between the upper and lower limits of a bootstrapped 95% confidence interval (CI) for the indirect effect does not contain zero. Supporting our theory, the analysis showed that, even controlling for the effect of perceived time affluence, the mountain top (vs. bottom) condition's positive effect on participants' choice to make their own trail-mix was mediated by their openness to learning (i.e., their choice to take the educational brochure;  $b = .11$ , 95% CI [.01, .36]).

We conducted two additional mediation analyses to further rule out the alternative time affluence account. The first tested whether perceived time affluence mediated the relationship between awe condition and experiential creation desire when openness to learning was included as a covariate. The results revealed that, when controlling for the effect of openness to learning, perceived time affluence was not a significant independent mediator (95% CI: [-.09, .10]). The second tested the following serial mediation: mountain bottom (vs. top)  $\rightarrow$  perceived time affluence  $\rightarrow$  openness to learning  $\rightarrow$  experiential creation desire. The results revealed that this

serial mediation pathway was also not significant (95% CI: [-.01, .05]). Together, these analyses offered additional evidence that awe's effect on experiential creation desire could not be adequately explained by perceived time affluence.

*Discussion.* Using a field setting and measuring actual behavior, experiment 2 obtained initial evidence for the mechanism predicted to underlie awe's ability to enhance the desire for experiential creation: openness to learning. As predicted, people exposed to a high-awe inducing setting (i.e., the mountain top condition) versus a low-awe inducing setting (i.e., the mountain bottom condition) were more likely to engage in experiential creation (i.e., choose to create their own trail-mix) and express an interest in learning (i.e., take an educational brochure). A mediation analysis also revealed that those in the mountain top (vs. bottom) condition were more likely to create their own trail-mix because of this greater openness to learning. Last, experiment 2 helped rule out the possibility that awe's effect on experiential creation is not due to greater openness to learning (as predicted), but instead due to greater perceived time affluence. The findings showed that although participants in the mountain top (vs. bottom) condition felt more time affluent, time affluence did not significantly affect their trail-mix choice or their decision to take a brochure.

Though the natural setting and measures of actual behavior used in experiment 2 allowed for findings with high external validity, they also had limitations. Namely, due to the inherent difficulty in controlling aspects of the real world environment, the naturalistic awe manipulation may have also manipulated other constructs, introducing possible confounds. Also, the measure of openness to learning that we used was not a direct measure, but rather a behavioral proxy. Thus, it is possible that participants' choice to take (vs. not take) an educational brochure signaled more than their openness to learning. Experiment 3 aimed to address both limitations.

### *EXPERIMENT 3*

Experiment 3 sought to conceptually replicate the relationships among awe, openness to learning, and experiential creation desires from the prior field experiment, but in a controlled lab setting. Experiment 3 also sought to extend the previously obtained process evidence by using a different operationalization of desire for experiential creation (i.e., people's preferences for solving problems in ways that either do or do not involve experiential creation), using a more explicit openness to learning measure (vs. an indirect, behavioral measure as in experiment 2), and ruling out several alternative explanations. First, experiment 3 aimed to further rule out the alternative time affluence account examined in the prior study. Second, given that prior work on experiential creation motives has focused on how competence and autonomy might stimulate the undertaking of creation-oriented tasks (Dahl and Moreau 2007; Moreau and Herd 2010; Mochon et al. 2012; Watson and Shove 2008), experiment 3 sought to rule out the possibility that awe's ability to enhance the desire to engage in experiential creation is driven by motivations for competence or autonomy rather than a motivation to learn (as predicted). Third, experiment 3 aimed to rule out construal, as one could argue that awe may be boosting abstract construal, thereby increasing the extent decision making is driven by desirability (vs. feasibility; Liberman and Trope 1998). If so (and if one were to also argue that experiential creation is relatively high in desirability and low in feasibility), construal could be a possible alternative mechanism.

#### *Participants and Procedure*

One hundred fourteen university students (55% female;  $M_{\text{Age}} = 22.08$ ;  $SD_{\text{Age}} = 4.41$ ) completed the study in exchange for extra course credit. The experiment used a 2 cell (Emotion: Awe vs. Happiness) between-subjects design.

In the first of several ostensibly unrelated surveys, we manipulated participants' emotions by randomly assigning them to watch either an awe-eliciting or happiness-eliciting commercial (as in experiment 1; Rudd et al. 2012). Participants then reported how much they liked the commercial (1 = *not at all*, 7 = *very much*) and answered filler items about TV brands. In a second survey, we presented participants with five common problems (e.g., something in their home needed repair or improvement; see the Web Appendix for all items). For each problem, participants imagined they were currently experiencing it and reported which of two solutions they would pick: One was an experiential creation solution (e.g., 1 = *try to fix it myself*), the other was not (e.g., 0 = *have someone else [e.g., a handyman] try to fix it for me*). The percentage of experiential creation solutions chosen was our measure of experiential creation desire.

In a third survey, participants completed a 4-item openness to learning index ( $\alpha = .85$ ; "I am open to altering how I see or understand the world," "I want to increase my knowledge," "I am curious," and "I am open to acquiring new knowledge"; 1 = *not at all*, 7 = *extremely*) and a 3-item perceived time affluence index ( $\alpha = .90$ ; "I am pressed for time," "Time is constricted," and "Time is slipping away"; 1 = *not at all*, 7 = *extremely*; items reverse-coded). Next, a 4-item scale measured participants' motivation for competence ( $\alpha = .96$ ; "I want to feel competent," "I want to feel talented," "I want to feel smart," and "I want to do things well"; 1 = *not at all*, 7 = *extremely*; Dahl and Moreau 2007) and a 4-item scale measured their motivation for autonomy ( $\alpha = .88$ ; "I want to be free to make my own choices," "I want to express myself," "I don't want to be controlled," "I don't want to feel pressured"; 1 = *not at all*, 7 = *extremely*; Dahl and Moreau 2007). Participants then completed the behavior identification form (BIF; Vallacher and Wegner 1989), a measure of construal, in which they classified 25 tasks (e.g., taking a test) as either low level (e.g., answering questions) or high level (e.g., showing one's knowledge). Last,

participants reported their current emotions: “fear,” “anger,” “sadness,” “pride,” “awe,” “peacefulness,” “excitement,” “happiness,” and “boredom” (1 = *not at all*; 7 = *extremely*).

### *Results and Discussion*

*Manipulation checks.* One-way ANOVAs on the emotion items confirmed that those in the awe condition ( $M = 3.39$ ,  $SD = 1.91$ ) versus happiness condition ( $M = 1.79$ ,  $SD = 1.33$ ) reported experiencing stronger feelings of awe during the experiment ( $F(1, 112) = 26.85$ ,  $p < .01$ ,  $\eta_p^2 = .19$ ), and that those in the happiness condition ( $M = 5.02$ ,  $SD = 1.73$ ) versus awe condition ( $M = 4.16$ ,  $SD = 1.54$ ) reported feeling happier during the experiment ( $F(1, 112) = 7.85$ ,  $p = .01$ ,  $\eta_p^2 = .07$ ). Ratings of the other emotions did not differ significantly across conditions ( $F_s < 1.33$ , NS). Participants’ liking of the commercials also did not differ across conditions ( $M_{Awe} = 4.72$ ,  $SD_{Awe} = 1.51$  vs.  $M_{Happy} = 5.07$ ,  $SD_{Happy} = 1.43$ ;  $F(1, 112) = 1.63$ , NS).

*Experiential creation desires.* To test whether awe altered experiential creation desires, we conducted a one-way ANOVA on the percentage of experiential creation solutions selected. As predicted, the results showed that participants in the awe condition ( $M = 49.82\%$ ,  $SD = 21.09\%$ ) versus happiness condition ( $M = 39.30\%$ ,  $SD = 19.99\%$ ) more strongly preferred to use experiential creation solutions to solve problems ( $F(1, 112) = 7.48$ ,  $p = .01$ ,  $\eta_p^2 = .06$ ).

*Openness to learning.* To test whether awe altered openness to learning, we conducted a one-way ANOVA on the openness to learning index. The results revealed the predicted effect of emotion condition ( $F(1, 112) = 9.83$ ,  $p < .01$ ,  $\eta_p^2 = .08$ ): Participants in the awe condition ( $M = 4.56$ ,  $SD = 1.35$ ) reported that they currently felt more open to the prospect of learning than did those in the happiness condition ( $M = 3.66$ ,  $SD = 1.69$ ).

*Time affluence, competence, autonomy, and construal.* We conducted one-way ANOVAs on the perceived time affluence index, competence index, autonomy index, and number of tasks

classified as high level on the BIF. In line with prior work (Rudd et al. 2012), the results showed that participants in the awe condition ( $M = 3.87$ ,  $SD = 1.44$ ) versus happiness condition ( $M = 3.25$ ,  $SD = 1.67$ ) felt more time affluent ( $F(1, 112) = 4.50$ ,  $p = .04$ ,  $\eta_p^2 = .04$ ). However, those in the awe and happiness conditions were equally motivated to be competent ( $M_{Awe} = 6.07$ ,  $SD_{Awe} = 1.25$  vs.  $M_{Happy} = 6.01$ ,  $SD_{Happy} = 1.29$ ;  $F(1, 112) = .06$ ,  $p = .81$ ) and autonomous ( $M_{Awe} = 6.03$ ,  $SD_{Awe} = 1.31$  vs.  $M_{Happy} = 5.94$ ,  $SD_{Happy} = 1.33$ ;  $F(1, 112) = .13$ ,  $p = .72$ ) and construed an equal number of tasks at an abstract, high level ( $M_{Awe} = 16.89$ ,  $SD_{Awe} = 4.74$  vs.  $M_{Happy} = 16.30$ ,  $SD_{Happy} = 4.17$ ;  $F(1, 112) = .51$ ,  $p = .48$ ). Thus, neither motivations for competence or autonomy nor construal level could account for why awe (vs. happiness) boosted creation desires.

*Mediation analyses.* We conducted a mediation analysis (PROCESS model 4; 10,000 resamples; Hayes 2013) to test if, as predicted, greater openness to learning mediated the relationship between emotion condition (happiness = 0, awe = 1) and experiential creation desires (i.e., participants' preferences for solving problems with experiential creation solutions). To rule out the possibility that perceived time affluence (which was found to differ across emotion conditions) was the true mechanism underlying awe's ability to alter experiential creation desires, the perceived time affluence index was included as a covariate. The results revealed that, even controlling for the effect of perceived time affluence, participants in the awe (vs. happiness) condition expressed a greater preference for experiential creation solutions because of a greater openness to learning ( $b = 3.95$ ; 95% CI: [1.68, 7.76]).

We conducted two additional mediation analyses to further rule out the alternative time affluence account. The first tested if perceived time affluence mediated the relationship between emotion condition and experiential creation desire when openness to learning was included as a covariate. The results showed that, when controlling for the effect of openness to learning,

perceived time affluence was not a significant independent mediator (95% CI: [-5.03, .01]). The second tested the following serial mediation: experiencing awe (vs. happiness) → perceived time affluence → openness to learning → experiential creation desires. The results showed that this serial mediation pathway was not significant (95% CI: [-1.92, .01]). Together, these results offered additional evidence that the effect of awe (vs. happiness) on desire for experiential creation could not be adequately explained by perceived time affluence.

*Discussion.* Using a controlled lab setting, a different manipulation of awe (i.e., one with fewer potential confounds), and a more direct measure of openness to learning, experiment 3 conceptually replicated the findings of experiment 2. Namely, participants made to feel awe (vs. happiness) subsequently reported being more open to learning and exhibited a stronger preference for solving problems with experiential creation solutions. Further supporting our conceptual model, mediation analyses showed that the effect of awe (vs. happiness) on problem solving preferences was indeed driven by people's openness to learning. Experiment 3 also helped rule out several alternative accounts, showing that participants in both emotion conditions exhibited the same construal level and same needs for competence and autonomy. Thus, the greater preference for experiential creation solutions expressed by participants in the awe (vs. happiness) condition could not be explained by any differences in construal level or motivations for competence or autonomy. Moreover, mirroring the results of experiment 2, although time perception did differ across conditions—such that those in the awe (vs. happiness) condition felt more time affluent—mediation analyses revealed that this time affluence could not account for awe's effect on experiential creation desire. Though these findings do not rule out the possibility that perceived time affluence could *ever* play an independent role in awe's ability to influence experiential creation desire, the converging evidence from experiments 2 and 3 strongly supports



the proposed openness to learning mechanism by showing that it consistently plays a significant, independent role in driving this effect (whereas perceived time affluence does not).

#### *EXPERIMENT 4*

Thus far, we've tested our hypotheses by comparing awe to happiness and neutral states. However, since awe could be classified as a highly activating or arousing emotion (whereas happiness is moderately activating), experiment 4 instead compared awe to excitement (which is also positive and highly activating; Russell 1980) so as to show that awe's effects on experiential creation and openness to learning are not simply due to arousal. For additional convergent validity, experiment 4 operationalized experiential creation desire as people's likelihood of purchasing a product that was framed as being either high or low in experiential creation. We chose this experimental paradigm because it allowed us to obtain empirical evidence for a key aspect of our conceptual definition of experiential creation: For an activity or product to be deemed experiential creation, a person must feel they are playing a direct, active role in creating (i.e., that they are an agent of the creation experience vs. a passive bystander). In the context of experiment 4, this should only be the case when the product is framed as high (vs. low) in experiential creation. Thus, we predicted a moderated mediation: Participants who experienced awe (vs. excitement or a neutral state) would be more likely to purchase the product when it was framed as high in experiential creation (and this effect would be mediated by openness to learning), but this effect would be attenuated when the product was framed as low in experiential creation. Last, as a test of theory specificity, experiment 4 included a measure of general task persistence to help rule out the possibility that awe is not specifically enhancing experiential

creation desires, but rather enhancing motivation more broadly (e.g., general persistence or willingness to engage in any activity).

### *Participants and Procedure*

Three hundred university students (53.3% female;  $M_{\text{Age}} = 22.09$ ;  $SD_{\text{Age}} = 3.90$ ) participated for extra course credit. The experiment used a 3 (Emotion: Awe vs. Excitement vs. Neutral) x 2 (Product Framing: High vs. Low Experiential Creation) between-subjects design.

The first of several ostensibly unrelated surveys manipulated emotions by randomly assigning participants to spend a few minutes carefully viewing an awe-eliciting, excitement-eliciting, or emotionally neutral print ad for an allegedly real ski resort (see the Web Appendix). The ads were identical except for the featured image, which was of a known elicitor of awe (a towering mountain), excitement (a jumping downhill skier), or a neutral state (skis—inanimate objects; Mikels et al. 2005). Participants then reported how much they liked the ad and the ski resort (1 = *not at all*, 7 = *very much*), how the ad made them feel (1 = *very negative*, 7 = *very positive*), and “how surprising or unexpected” and “how novel or atypical” it was for the image to be used in a ski resort ad (1 = *not at all*, 7 = *very*).

In a second survey, participants viewed an ad for a product (cake mix) that was framed (randomly) as being either high or low in experiential creation (see Web Appendix). The brand, product, and imagery were identical in both ads, but the ad copy differed systematically across conditions. For instance, the high [low] experiential creation frame condition read, “Create your own cake with Duncan Hines cake mix” [“Let Duncan Hines cake mix do the work for you”]. Participants then reported their likelihood of purchase ( $\alpha = .92$ ; “How interested are you in purchasing the advertised product?”, “How likely are you to purchase the advertised product in the future?”, and “How much do you like the advertised product?”; 1 = *not at all*, 7 = *very*).

In a third survey, participants responded to the same 4-item openness to learning index from experiment 3 ( $\alpha = .86$ ) and then completed a measure of general persistence (Dzhogleva and Lamberton 2014). For this persistence task, we gave participants 12 anagrams to solve and told them to continue on to the next screen once they had solved as many anagrams as they could. What participants did not know is that half of these anagrams were unsolvable. Thus, the key dependent variable here was how long participants persisted on this task before giving up. Last, participants reported the extent they felt “fear,” “anger,” “sadness,” “pride,” “awe,” “peacefulness,” “excitement,” “happiness,” “boredom,” “anxiety,” “love,” “surprise,” “amusement,” and “disgust” during the study (1 = *not at all*; 7 = *extremely*).

### *Results and Discussion*

*Manipulation checks.* We conducted one-way ANOVAs on the emotion items. They confirmed ( $F(2, 297) = 18.43, p < .01, \eta_p^2 = .11$ ) that participants in the awe condition ( $M = 4.73, SD = 1.99$ ) reported experiencing stronger feelings of awe during the experiment than did those in the excitement condition ( $M = 3.30, SD = 1.82; t(297) = 5.35, p < .01$ ) or neutral condition ( $M = 3.34, SD = 1.83; t(297) = 5.22, p < .01$ ). The excitement and neutral conditions did not differ in their feelings of awe ( $t(297) = .16, p = .87$ ). The analyses also confirmed ( $F(2, 297) = 7.16, p < .01, \eta_p^2 = .05$ ) that participants in the excitement condition ( $M = 5.23, SD = 1.74$ ) reported experiencing stronger excitement than did those in the awe condition ( $M = 4.58, SD = 1.85; t(297) = 2.46, p = .01$ ) or neutral condition ( $M = 4.27, SD = 1.92; t(297) = 3.72, p < .01$ ). The awe and neutral conditions did not differ in their feelings of excitement ( $t(297) = 1.20, p = .23$ ).

With the exception of the neutral condition ( $M = 1.50, SD = 1.11$ ) producing marginally more anger than the awe condition ( $M = 1.25, SD = .71; t(297) = 1.89, p = .06$ ) but not the excitement condition ( $M = 1.32, SD = .87; t(297) = 1.39, p = .17$ ) and the neutral condition ( $M =$

1.49,  $SD = .99$ ) producing marginally more boredom than the awe ( $M = 1.26$ ,  $SD = .67$ ;  $t(297) = 1.91$ ,  $p = .06$ ) and excitement conditions ( $M = 1.27$ ,  $SD = .79$ ;  $t(297) = 1.88$ ,  $p = .06$ ), the conditions did not differ on the other reported emotions ( $ts < 1.31$ , NS; and anger and boredom were nevertheless low in all conditions). Moreover, although the ads in the awe ( $M = 5.15$ ,  $SD = 1.18$ ) and excitement conditions ( $M = 5.25$ ,  $SD = 1.20$ ) made participants feel more positive than did the ad in the neutral condition ( $M = 4.79$ ,  $SD = 1.41$ ; Awe vs. Neutral:  $t(297) = 2.00$ ,  $p = .05$ ; Excitement vs. Neutral:  $t(297) = 2.60$ ,  $p = .01$ ), they did not differ from one another ( $t(297) = .56$ ,  $p = .57$ ). These analyses suggest that the awe and excitement conditions induced our target emotions, but not other emotions, and did not differ in terms of general positivity. Additionally, neither the extent to which participants liked the ad or ski resort or found the image in the ad surprising or atypical for a ski resort ad significantly differed across conditions ( $ts < 1.36$ , NS).

*General task persistence.* The amount of time (in seconds) participants persisted on the anagram task was log-transformed to correct for positive skewness prior to analyses. As predicted, a one-way ANOVA revealed that participants in the awe ( $M = 2.22$ ,  $SD = .29$ ), excitement ( $M = 2.21$ ,  $SD = .36$ ), and neutral conditions ( $M = 2.18$ ,  $SD = .39$ ) did not differ in how long they persisted on the unsolvable anagram task ( $F(2, 297) = .24$ ,  $p = .79$ ). The number of anagrams correctly solved also did not differ across conditions ( $ts < 1.29$ , NS).

*Openness to learning.* A one-way ANOVA conducted on the openness to learning index showed ( $F(2, 297) = 5.07$ ,  $p < .01$ ,  $\eta_p^2 = .03$ ) that participants in the awe condition ( $M = 5.73$ ,  $SD = 1.29$ ) currently felt more open to learning than did those in the excitement ( $M = 5.30$ ,  $SD = 1.23$ ;  $t(297) = 2.25$ ,  $p = .03$ ) or neutral conditions ( $M = 5.14$ ,  $SD = 1.45$ ;  $t(297) = 3.09$ ,  $p < .01$ ).

*Experiential creation desire.* A 3 (Emotion: Awe vs. Excitement vs. Neutral) x 2 (Product Framing: High vs. Low Experiential Creation) ANOVA conducted on the purchase likelihood

index showed the predicted interaction ( $F(2, 294) = 3.59, p = .03, \eta_p^2 = .02$ ). Participants in the awe condition ( $M = 5.27, SD = 1.48$ ) reported a greater likelihood of purchasing the cake mix than did those in the excitement ( $M = 4.03, SD = 2.08; p < .01$ ) or neutral conditions ( $M = 4.26, SD = 1.81; p = .01$ ) when the cake mix was framed as high in experiential creation (the neutral and excitement conditions did not differ;  $p = .53$ ). However, purchase likelihood did not differ across the awe ( $M = 4.66, SD = 1.70$ ), excitement ( $M = 4.73, SD = 1.84$ ), and neutral conditions ( $M = 4.61, SD = 1.67$ ) when the cake mix was framed as low in experiential creation ( $ps > .72$ ).

*Moderated mediation analyses.* According to our theory, experiencing awe (vs. a neutral state or excitement) should increase openness to learning, which should in turn increase people's likelihood of purchasing the cake mix when it is framed as a high experiential creation product, but not when it is framed as a low experiential creation product. To test our conceptual model, we conducted two moderated mediation analyses (PROCESS model 4; 10,000 resamples; Hayes 2013) using procedures recommended for performing mediation analyses with multi-categorical independent variables (Hayes and Preacher 2014). In the first analysis, emotion condition (excitement = 0, awe = 1) was the independent variable, openness to learning was the mediator, experiential creation product framing (high = 0, low = 1) was the second-stage moderator, and purchase likelihood was the dependent variable. The neutral condition was included as a covariate. The second analysis was the same, except emotion condition (neutral = 0, awe = 1) was the independent variable and the excitement condition was included as a covariate.

As predicted, the results of both analyses showed a significant moderated mediation (Excitement vs. Awe: Index =  $-.36$ ; 95% CI:  $[-.75, -.06]$ ; Neutral vs. Awe: Index =  $-.49$ ; 95% CI:  $[-.92, -.17]$ ): Openness to learning significantly mediated the effect of emotion condition on purchase likelihood when the cake mix was framed as high in experiential creation (Excitement

vs. Awe:  $b = .28$ ; 95% CI: [.05, .58]; Neutral vs. Awe:  $b = .38$ ; 95% CI: [.14, .70]), but this indirect effect was nonsignificant when the cake mix was framed as low in experiential creation (Excitement vs. Awe:  $b = -.08$ ; 95% CI: [-.25, .004]; Neutral vs. Awe:  $b = -.11$ ; 95% CI: [-.29, .01]). In sum, when the product was framed as high in experiential creation, the positive effect of awe (vs. excitement or a neutral state) on purchase likelihood was mediated by openness to learning; when the product was framed as low in experiential creation, purchase likelihood did not differ across conditions and the indirect effect of openness to learning was attenuated.

*Discussion.* Experiment 4 further supported the prediction that awe increases experiential creation desires, showing that people induced to feel awe (vs. excitement or a neutral state) expressed a greater likelihood of purchasing a product when it was framed as high in experiential creation, but not when it was framed as low in experiential creation. In line with our theory and proposed underlying mechanism, participants in the awe (vs. excitement or neutral) condition also felt more open to learning. Notably, moderated mediation analyses showed that the greater openness to learning felt by participants in the awe (vs. excitement or neutral) condition drove their increased likelihood of buying the cake mix when it was framed as high in experiential creation (this indirect effect was nonsignificant when the cake mix was framed as low in experiential creation). Last, experiment 4 supported our theory's specificity and helped rule out the possibility that awe is simply boosting general motivation, as those in the awe, neutral, and excitement conditions exhibited equal persistence on the unsolvable anagram task (see the Web Appendix for analyses that indicate this null result was not due to order of presentation effects).

We also conducted two follow-up experiments (see Web Appendix) to obtain additional evidence for the mediating role of openness to learning and to further rule out the alternative general motivation account. Moreover, because the experience of awe can lead to a diminished

sense of self (i.e., feeling one's being and goals to be less significant) relative to something deemed vaster than the individual (Piff et al. 2015), these experiments also aimed to rule out a diminished sense of self as an alternative explanation. Finally, these experiments also extended the generalizability of our findings by comparing awe with other discrete positive emotions. To that end, follow-up experiment B (N = 155) manipulated awe (vs. pride vs. a neutral state) using a narrative recall task (Piff et al. 2015), and experiment C (N = 272) manipulated awe (vs. amusement vs. a neutral state) using nature videos (Valdesolo, Park, and Gottlieb 2016).

After the emotion manipulations, participants in both studies imagined they were hungry and made five hypothetical choices between comparable meal options that were either high or low in experiential creation (e.g., “Make a bowl of homemade soup from scratch on the stove” or “Microwave a bowl of canned soup”). Participants then reported their general desire to make or create things on a 7-item index (1 = *not at all*, 7 = *very much*; e.g., “I want to create something” and “I would like to fix or build things”), general desire to exercise on a 9-item index (1 = *not at all*, 7 = *very much*; e.g., “I desire to exercise” and “I want to go for a run”), openness to learning (as in experiment 3), and perceptions of a small self on a 10-item index (Piff et al. 2015). Last, they reported their emotions (as in experiment 4). For both studies, the core prediction was a serial mediation: Participants who experienced awe (vs. pride or a neutral state in experiment A; vs. amusement or a neutral state in experiment B) would subsequently express a greater openness to learning, which would in turn increase their general desire to create, which would in turn lead them to exhibit a stronger preference for meals that required a high amount of experiential creation to prepare (vs. comparable meals low in experiential creation).

For experiment B [experiment C], one-way ANOVAs showed that participants in the awe (vs. neutral and pride [amusement]) condition more strongly favored (i.e., chose a significantly

greater percentage of) the high experiential creation meals ( $ps \leq .02$ ), scored significantly higher on the general creation desires index ( $ps \leq .03$ ), and expressed a significantly greater openness to learning ( $ps \leq .02$ ). In line with prior research (Piff et al. 2015), small self ratings were also significantly higher in the awe condition relative to the neutral and pride [amusement] conditions ( $ps \leq .03$ ). However, supporting our theory's specificity and helping rule out the alternative explanation that awe is simply boosting general motivation (e.g., to engage in any activity), those in the awe, neutral, and pride [amusement] conditions expressed an equal desire to exercise ( $ps = NS$ ). Last, serial mediation analyses (PROCESS model 6) tested the predicted model: emotion condition  $\rightarrow$  openness to learning  $\rightarrow$  general desire for experiential creation  $\rightarrow$  meal preferences. To rule out the possibility that a diminished sense of self was the true underlying mechanism, the small self index was included as a covariate. The results revealed that, even controlling for any effect of small self, the serial indirect effect from emotion condition to meal preferences through both mediators (i.e., openness to learning and general desire to create) was indeed significant (both when comparing awe vs. neutral and awe vs. pride [amusement];  $ps < .05$ ). Together, these results provide further converging evidence for the proposed openness to learning mechanism.

### *EXPERIMENT 5*

The prior experiments showed that experiencing awe (vs. happiness, excitement, pride, amusement, or a neutral state) can boost the desire to partake in experiential creation and that a greater openness to learning seems to drive this effect. Experiment 5 sought to provide further evidence for our conceptual model by testing our prediction that people's dispositional need for closure would serve as a first-stage moderator of our previously observed effects: Experiencing



awe (vs. happiness) should increase people's openness to learning (and, in turn, their desire to partake in experiential creation) if their need for closure is high, but not if their need for closure is low. In other words, openness to learning should mediate the effect of awe (vs. happiness) on desire for experiential creation only when need for closure is high (vs. low).

### *Participants and Procedure*

One hundred ninety-three university students (57.5% female;  $M_{\text{Age}} = 21.67$ ;  $SD_{\text{Age}} = 2.91$ ) participated for extra course credit. The experiment used a mixed-measures design: Emotion (Awe vs. Happiness) was a between-subjects factor and Need for Closure was a measured factor.

After arriving at the experimental lab, we told participants they would be completing several ostensibly unrelated surveys. In the first survey, participants completed the 15-item short-form Need for Closure Scale (mean-centered;  $\alpha = .92$ ; Roets and Van Hiel 2011). Sample items include "I dislike unpredictable situations" and "I enjoy having a clear and structured mode of life" (1 = *strongly disagree*, 6 = *strongly agree*). In the second survey, to manipulate emotions, we randomly assigned participants to watch either an awe-eliciting or happiness-eliciting slideshow (as in follow-up experiment A). Participants then reported how much they liked the slideshow images (1 = *not at all*, 7 = *very much*) and how the slideshow made them feel (1 = *very negative*, 7 = *very positive*). In the third survey, participants responded to the 4-item openness to learning index used in experiment 3 ( $\alpha = .85$ ) and the 7-item general experiential creation desire index used in follow-up experiments B and C ( $\alpha = .95$ ). Participants also reported the extent they currently felt "anger," "fear," "sadness," "anxiety," "love," "happiness," "peacefulness," "excitement," "awe," "pride," and "boredom" (1 = *not at all*; 7 = *extremely*).

As part of the fourth survey, we told participants (as a cover story) that the researchers were interested in consumers' preferences for certain materials, colors, and patterns and that to

study these preferences, the researchers were offering all participants a handmade coaster. We told participants that they could choose to either “make your own handmade coaster from the provided craft supplies” or “take a premade coaster that was made from the same collection of craft supplies.” A research assistant then led participants over to a table where we had displayed the various craft supplies (e.g., square cork coaster bases, craft glue, and bins containing small ceramic, wood, and glass tiles of various colors) and premade coasters.

We then told participants that if they chose to make a handmade coaster, they would receive basic instructions on how they could use these supplies to make the coaster, but that they would then be given free reign over the craft supplies and allowed to create their coaster however they saw fit. We also told them that if they chose to take a premade handmade coaster, they would be allowed to thoroughly examine and choose from the selection of premade coasters on display. The research assistant then reiterated that participants would get to keep their coaster regardless of whether they chose to make a coaster or take a premade coaster. At this point, participants then decided whether to make a coaster (coded as 1) or take a premade coaster (coded as 0), and carried out their decision. This choice served as our key dependent variable.

### *Results and Discussion*

*Manipulation checks.* One-way ANOVAs on the emotion items confirmed that those in the awe condition ( $M = 3.81$ ,  $SD = 2.17$ ) versus happiness condition ( $M = 2.25$ ,  $SD = 1.63$ ) reported feeling stronger awe during the experiment ( $F(1, 191) = 32.12$ ,  $p < .01$ ,  $\eta_p^2 = .14$ ), and that those in the happiness condition ( $M = 4.90$ ,  $SD = 1.66$ ) versus awe condition ( $M = 3.68$ ,  $SD = 1.86$ ) reported feeling stronger happiness ( $F(1, 191) = 23.24$ ,  $p < .01$ ,  $\eta_p^2 = .11$ ). Ratings of the other emotions did not differ across conditions ( $F_s < .50$ , NS). Moreover, regressions revealed that, for all the emotion items, the main effect of condition was not moderated by need for

closure ( $t_s < 1.69$ , NS). Participants in the awe and happiness conditions also liked the slideshows equally ( $M_{Awe} = 5.41$ ,  $SD_{Awe} = 1.39$  vs.  $M_{Happy} = 5.11$ ,  $SD_{Happy} = 1.31$ ;  $F(1, 191) = 2.28$ ,  $p = .13$ ) and felt equally positive in response to them ( $M_{Awe} = 5.06$ ,  $SD_{Awe} = 1.12$  vs.  $M_{Happy} = 5.27$ ,  $SD_{Happy} = 1.01$ ;  $F(1, 191) = 1.80$ ,  $p = .18$ ). Moreover, regressions showed that the main effect of condition on these items was not moderated by need for closure ( $t_s < .86$ , NS).

*Openness to learning and experiential creation desire.* We conducted one-way ANOVAs on the openness to learning and general creation desire indices, and a logistic regression on the choice to make (vs. take) a coaster. As predicted, participants in the awe (vs. happiness) condition were more open to learning ( $M_{Awe} = 5.20$ ,  $SD_{Awe} = 1.28$  vs.  $M_{Happy} = 4.69$ ,  $SD_{Happy} = 1.50$ ;  $F(1, 191) = 6.42$ ,  $p = .01$ ,  $\eta_p^2 = .03$ ), scored higher on the general creation desire index ( $M_{Awe} = 4.63$ ,  $SD_{Awe} = 1.65$  vs.  $M_{Happy} = 4.05$ ,  $SD_{Happy} = 1.66$ ;  $F(1, 191) = 5.82$ ,  $p = .02$ ,  $\eta_p^2 = .03$ ), and were more likely to make a coaster ( $M_{Awe} = 61.46\%$  vs.  $M_{Happy} = 45.36\%$ ;  $B = .65$ ,  $\text{Exp}(B) = 1.92$ ,  $\text{Wald} = 4.98$ ;  $p = .03$ ). Regression analyses additionally showed that need for closure did not have a significant main effect on openness to learning ( $F(1, 191) = .73$ ,  $p = .39$ ), general creation desires ( $F(1, 191) = .09$ ,  $p = .97$ ), or coaster choice ( $\text{Wald} = .10$ ;  $p = .76$ ).

*Moderated mediation analysis.* Our theory predicts a first-stage interaction between emotion condition and need for closure, such that awe (vs. happiness) leads to greater openness to learning (and, in turn, greater experiential creation desire and greater likelihood of making a coaster) when need for closure is high, but not when need for closure is low. As an initial test of this model, we examined (PROCESS model 1; Hayes 2013) if there was indeed an interactive effect of emotion condition and need for closure on our key dependent variable: coaster choice. The results showed that, as predicted, the main effect of emotion condition ( $b = .66$ ; 95% CI: [.08, 1.24]) was qualified by a significant interaction ( $b = .64$ ; 95% CI: [.08, 1.24]), such that

participants in the awe (vs. happiness) condition were more likely to make a coaster if their need for closure was high (1 SD above the mean;  $b = 1.30$ ; 95% CI: [.46, 2.14]) but not if it was low (1 SD below the mean;  $b = .02$ ; 95% CI: [-.80, .84]). We thus proceeded to test our full model by conducting a moderated serial mediation analysis (Hayes 2015): Emotion condition (happiness = 0, awe = 1) was the independent variable, openness to learning was the first mediator, general experiential creation desire was the second mediator, coaster choice (take = 0, make = 1) was the dependent variable, and need for closure was a first-stage moderating variable. The analysis (10,000 resamples) showed the following results (see the Web Appendix for a full illustration).

First, the effect of emotion condition on openness to learning was significantly moderated by need for closure ( $b = .62$ , 95% CI: [.23, 1.01]): Feeling awe (vs. happiness) had a significant positive influence on openness to learning when need for closure was high (1 SD above the mean;  $b = 1.13$ , 95% CI: [.58, 1.68]), but the effect of awe (vs. happiness) on openness to learning was not significant when need for closure was low (1 SD below the mean;  $b = -.11$ , 95% CI: [-.66, .44]). Second, openness to learning had a significant positive influence on people's general desire to create ( $b = .62$ , 95% CI: [.47, .76]) and this desire to create had a significant positive influence on their decision to make (vs. take) a coaster ( $b = .40$ , 95% CI: [.17, .63]). Third, the serial indirect effect through both mediators was significantly moderated by need for closure (i.e., the index of moderated mediation was significant; 95% CI: [.01, .37]). Namely, the awe (vs. happiness)  $\rightarrow$  openness to learning  $\rightarrow$  general creation desire  $\rightarrow$  choice to make (vs. take) a coaster pathway was significant and positive when need for closure was high ( $b = .28$ , 95% CI: [.07, .60]), but nonsignificant when need for closure was low ( $b = -.03$ , 95% CI: [-.23, .16]). Together, these results confirm the predicted moderated serial mediation.

*Discussion.* Measuring actual behavior, experiment 5 provided further evidence that awe enhances openness to learning and, in turn, people's desire for experiential creation. Consistent with the notion that awe elicits uncertainty about one's existing mental structures (Keltner and Haidt 2003) and that people high (vs. low) in need for closure are more motivated to acquire knowledge when feeling such uncertainty (Kruglanski et al. 1991; Kruglanski et al. 1993; Van Hiel and Mervielde 2002; Vermeir et al. 2002), experiment 5 also revealed a moderating role of need for closure. For participants high in need for closure, feeling awe (vs. happiness) made them more open to learning, which in turn increased their desire to create, which in turn made them more likely to make (vs. take) a coaster. However, for participants low in need for closure, this serial mediation effect was attenuated (as feeling awe vs. happiness no longer increased openness to learning). These findings support and bolster our theory that awe enhances the desire to engage in experiential creation and that greater openness to learning drives this effect.

### *GENERAL DISCUSSION*

Awe has been characterized as a powerful emotion—one capable of challenging people's existing mental structures and eliciting a need for accommodation (Keltner and Haidt 2003). Across eight experiments, we predicted and found that awe heightens people's desire to partake in experiential creation (experiments 1-5, follow-up experiments A, B, and C) and that this effect is due to awe's ability to open people up to the prospect of learning (experiments 2-5, follow-up experiments B and C). We obtained further evidence for our conceptual model by showing that dispositional need for closure moderates awe's ability to increase people's openness to learning and, consequently, their desire for experiential creation (experiment 5). Notably, we obtained

these findings in various settings (from online and in the lab to the summit of a mountain in the Swiss Alps) on two continents (North America and Europe) and when comparing awe to a variety of other emotions (happiness, excitement, pride, amusement, and a neutral state). We also used a wide range of participant samples (Mturkers, university students, hikers, and adults nationwide), measures (real choice, actual behavior, purchase likelihood, willingness to pay, and scenario-based measures), and methods (mediation, serial mediation, and moderated serial mediation) to further demonstrate the robustness of these predicted effects.

### *Theoretical and Practical Contributions*

The current work makes a number of contributions, both theoretical and practical. First, it contributes to the understanding of experiential creation, a topic invigorated by a growing stream of research in marketing. Prior work has provided valuable insights into the role of creation in consumer behavior, such as by investigating the factors that influence creativity (Burroughs and Mick 2004; Dahl and Moreau 2002; Mehta et al. 2012; Moreau and Dahl 2005), the perceived quality of creative experiences (Dahl and Moreau 2007), and the extent consumers value their creations (Norton et al. 2012). Our research took a different tack, extending this prior work by instead focusing on how to inspire a desire to create, offering evidence of a novel factor capable of enhancing people's desire to partake in experiential creation: awe. Moreover, in showing that awe increases experiential creation desires by heightening people's openness to learning, our research also connects to work that has sought to understand why consumers engage in creation-oriented tasks (Dahl and Moreau 2007; Moreau and Herd 2010; Mochon et al. 2012). Though much of this work has focused on two particular motivators, autonomy and competence (Dahl and Moreau 2007; Moreau and Herd 2010; Mochon et al. 2012; Watson and Shove 2008), qualitative findings suggested that learning may also motivate creation (Dahl and Moreau 2007).

Thus, by providing empirical evidence of the role that openness to learning plays in fueling consumers' experiential creation desires, our research contributes to this extant work.

Second, our research contributes to prior work on human learning and knowledge acquisition by identifying awe as a novel way to increase people's willingness to learn. This contribution is particularly important for marketing since consumers often eschew learning, change, and other forms of mental activity due to the ease of keeping with established habits and employing mental shortcuts (Fiske and Taylor 1984; Wood and Neal 2009). To overcome such obstacles, marketers frequently employ behavioral influence tactics (e.g., offer sales promotions; Gupta 1988) or wait for consumers to experience major life events (e.g., marriage, starting a new job, or having a baby; Andreasen 1984; Wood and Neal 2009). However, such strategies have drawbacks (e.g., sales promotions have limited effectiveness and it is often impractical to wait to target consumers until they experience a significant life change) and do not address the underlying problem: consumers' lack of intrinsic motivation to learn. Our findings demonstrate that experiencing awe can ameliorate this problem, suggesting that awe may be a valuable addition to the toolbox of marketers who seek to increase consumers' openness to learning.

Last, our findings enrich the emotion literature. In recent years, there has been an impetus for research that examines how different positive emotions influence psychological processes (as opposed to treating positive emotion as a unidimensional construct or simply labeling it as happiness; Lerner, Han, and Keltner 2007). Notably, because marketers often try to create positive environments for consumers or make consumers feel good, understanding how discrete positive emotions influence judgments and decision making is particularly important for the field of consumer behavior. Thus, in demonstrating that awe (vs. happiness, excitement, pride, amusement, or neutrality) is able to increase people's openness to learning and thereby enhance

their desire to partake in experiential creation, our work makes novel theoretical contributions to the growing stream of research that has begun examining the functional differences of discrete positive emotions (Fredrickson 2001; Griskevicius et al. 2010; Keltner and Haidt 2003) and highlights the importance of being strategic about the specific positive emotions marketers attempt to elicit. Moreover, since empirical research on the consequences of awe (especially in marketing) is still relatively nascent, the current work also helps fill this research lacuna.

#### *Limitations and Future Directions*

Our work examined whether awe could enhance people's desire to partake in experiential creation. It did not, however, include measures that could speak to what impact awe might have on people's subsequent enjoyment of these creative activities or creative performance. Though much prior work has studied the relationship between affect and creative ability, this literature has largely used valence of generalized affect or mood as the independent variable (e.g., positive vs. neutral mood; Baas, De Dreu, and Nijstad 2008; Isen, Daubman, and Nowicki 1987), rather than specific emotions. Consequently, whereas there is abundant evidence that positive mood or generalized positive affect can boost creative performance (Baas et al. 2008; Isen et al. 1987), the extent to which discrete positive emotions influence creative performance (and what varied mechanisms may drive these effects) remains a largely open question worthy of future research.

Although the present research showed that one's need for closure moderates awe's ability to boost experiential creation desires, another avenue for future research is to explore additional boundary conditions for the effects observed in our studies. For instance, it has been proposed that the presence of certain ancillary factors (e.g., virtue or threat) can flavor the experience of awe (Keltner and Haidt 2003), and it is possible that these factors might alter the experience in such a way that changes the relationship between awe and experiential creation. In particular,



given our finding that awe enhances experiential creation desires by promoting greater openness to learning, one might predict that flavoring an awe experience with threat (i.e., combining awe with feelings of fear) would instead reduce these desires. In other words, although experiencing awe may generally be enlightening and open one up to learning, experiencing a negative, threat-based variant of awe (Gordon et al. 2017) might have the opposite effect—it may be paralyzing and lead one to close oneself off to things like learning. Exploring such possibilities could further explicate when and why awe’s positive effect on creation desires might attenuate or reverse.

Given the imbalance between what is currently known about awe and awe’s frequent presence in marketing communications and consumption contexts, future research should also identify other consequences of experiencing awe. In the present research, we found that, by increasing their openness to learning, awe enhanced people’s desire to partake in experiential creation. Thus, a promising starting point for future research would be to see if awe has a similar impact on other consumer behaviors that have been linked to learning and curiosity (e.g., new product adoption, browsing, novelty and variety seeking, and brand switching; Burnham, Frels, and Mahajan 2003; Hirschman 1980; Robertson and Gatignon 1986).

### *Conclusion*

Awe is a mysterious and transformative feeling (Keltner and Haidt 2003). Our work on this enigmatic emotion showed that inducing awe can be an effective way of alleviating consumers’ lack of intrinsic motivation to learn as well as stimulating their desires to create. Our main processes of study—the experience of awe, the willingness to learn, and a thirst to create—are all too rare in everyday life. Considering that one key function of the marketplace is to improve consumers’ lives, marketers would be well-served to use awe in order to evoke the deeply ingrained—but often neglected—motivations to learn and create.

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## Inspired to Create:

### Awe Enhances Openness to Learning and the Desire for Experiential Creation

Melanie Rudd, Christian Hildebrand, and Kathleen D. Vohs

## WEB APPENDIX

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## FOLLOW-UP EXPERIMENT A

Follow-up experiment A was designed to conceptually replicate the findings of experiment 1 and provide a test of specificity. For convergent validity, we used a different operationalization of both the independent and dependent variables: Emotions were manipulated using a video slideshow and we measured consumers' willingness to pay for products containing experiential creation elements. We predicted that experiencing awe (vs. happiness) would lead people to be willing to pay more for these products. To test the specificity of our account, we also tested if awe alters people's willingness to pay for products that do not involve experiential creation. Because our theory specifically relates awe to experiential creation desires, we predicted that awe would not affect willingness to pay for these not-experiential-creation products.

### *Participants and Procedure*

Eighty-eight individuals from a university-run, nationwide pool (70% female;  $M_{\text{Age}} = 35.98$ ;  $SD_{\text{Age}} = 11.35$ ) completed the study in exchange for \$5. The experiment used a 2 cell (Emotion: Awe vs. Happiness) between-subjects design.

As a cover story, participants were told they would complete two unrelated surveys. In the first survey, emotions were manipulated by randomly assigning participants to watch an awe-eliciting or happiness-eliciting slideshow. The slideshows were the same length and included the same number of images. The images were of known elicitors of awe (e.g., galaxies, sunsets, sand dunes, mountain peaks, Earth from space, and waterfalls) or happiness (e.g., families, desserts, puppies, babies, kittens, and smiling couples; Mikels et al. 2005). Participants then reported how the slideshow made them feel (1 = *very bad*, 7 = *very good*; 1 = *very negative*, 7 = *very positive*) and how much they liked the images in the slideshow (1 = *not at all*, 7 = *very much*).



In a second survey, participants reported how much they would be willing to pay for 16 products. For each product, participants saw an image and a list of features, and then reported their willingness to pay. All products, images, and descriptions were the same across conditions and presented in random order. In total, eight of the products had experiential creation elements and eight did not. The products were four pieces of experiential creation furniture (a coffee table, sofa table, bookshelf, and dresser that required assembly), four pieces of not-experiential-creation furniture (a coffee table, sofa table, bookshelf, and dresser that came fully assembled), two experiential creation food products (an Italian pasta cookbook and all-purpose cookbook), two not-experiential-creation food products (a premade and home delivered pasta dish for two and premade and home delivered entrée for two), two experiential creation art products (a kit for making a woodworked pen and sketching/drawing set), and two not-experiential-creation art products (a premade woodworked pen and professional art print). Last, as a manipulation check, participants reported the extent they currently felt “fear,” “sadness,” “pride,” “awe,” “peacefulness,” “excitement,” “happiness,” and “boredom” (1 = *not at all*; 7 = *extremely*).

### *Results and Discussion*

*Manipulation checks.* One-way ANOVAs on the emotion items confirmed that those in the awe condition ( $M = 4.47$ ,  $SD = 1.86$ ) reported feeling stronger awe during the experiment than did those in the happiness condition ( $M = 1.89$ ,  $SD = 1.50$ ;  $F(1, 86) = 51.62$ ,  $p < .01$ ,  $\eta_p^2 = .38$ ), and that those in the happiness condition ( $M = 5.02$ ,  $SD = 1.12$ ) reported feeling happier during the experiment than did those in the awe condition ( $M = 4.26$ ,  $SD = 1.16$ ;  $F(1, 86) = 9.99$ ,  $p < .01$ ,  $\eta_p^2 = .10$ ). Ratings of the other emotions did not differ significantly across conditions ( $F_s < 2.44$ , NS). Moreover, participants in the awe and happiness conditions liked the slideshows equally ( $M_{Awe} = 6.12$ ,  $SD_{Awe} = 1.30$  vs.  $M_{Happy} = 5.84$ ,  $SD_{Happy} = 1.02$ ;  $F(1, 86) = 1.20$ ,  $p = .28$ )

and felt equally positive ( $M_{Awe} = 5.65$ ,  $SD_{Awe} = 1.13$  vs.  $M_{Happy} = 6.02$ ,  $SD_{Happy} = 1.01$ ;  $F(1, 86) = 2.64$ ,  $p = .11$ ) and equally good ( $M_{Awe} = 5.63$ ,  $SD_{Awe} = 1.09$  vs.  $M_{Happy} = 5.82$ ,  $SD_{Happy} = 1.01$ ;  $F(1, 86) = .76$ ,  $p = .39$ ) in response to them. Hence, the manipulation effectively altered emotional states without producing extraneous differences in other perceptions of the slideshow.

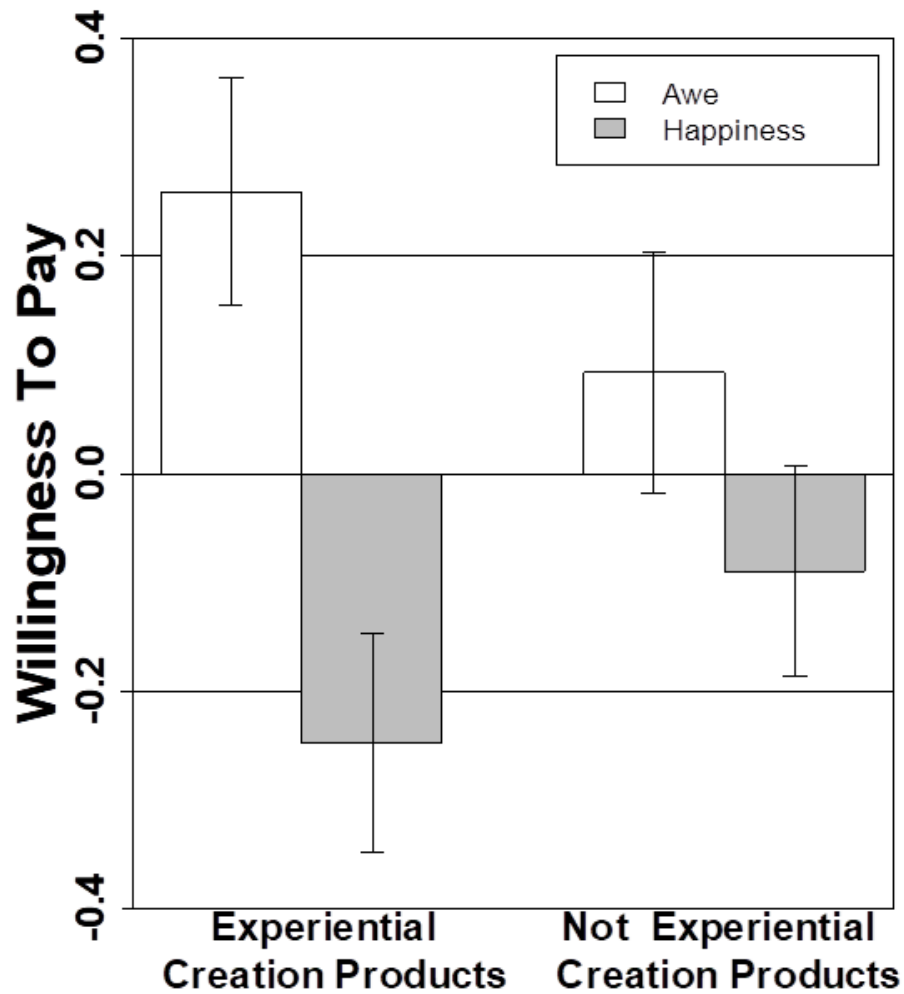
*Willingness to pay.* All WTP amounts were log-transformed to correct for positive skewness and then converted to Z-scores prior to analyses to allow for averaging and within-subjects comparison across products (Sussman and Alter 2012). We formed a WTP experiential creation index and a WTP not-experiential-creation index by averaging all WTP amounts for the experiential creation products ( $\alpha = .87$ ) and not-experiential-creation products ( $\alpha = .84$ ), respectively. To test our prediction that experiencing awe (vs. happiness) would influence consumers' WTP for products that involved experiential creation (but not WTP for comparable not-experiential-creation products), we conducted a 2 (between-subjects condition: awe vs. happiness) by 2 (within-subjects condition: product type) mixed-measures ANOVA. The results revealed (see Figure A1) the predicted interaction between emotion condition and product type ( $F(1, 86) = 21.15$ ,  $p < .01$ ,  $\eta_p^2 = .20$ ): Participants in the awe (vs. happiness) condition were willing to pay significantly more for the experiential creation products ( $Z_{Awe} = .26$ ,  $SD_{Awe} = .69$  vs.  $Z_{Happy} = -.25$ ,  $SD_{Happy} = .67$ ;  $p < .01$ ,  $\eta_p^2 = .12$ ), but were equally willing to pay for the not-experiential-creation products ( $Z_{Awe} = .09$ ,  $SD_{Awe} = .73$  vs.  $Z_{Happy} = -.09$ ,  $SD_{Happy} = .65$ ;  $p = .22$ ).

To assess whether a few specific items drove the observed effects, we also conducted two separate 2 (between-subjects condition: awe vs. happiness) by 8 (within-subjects condition: individual products evaluated) mixed-measures ANOVAs with Greenhouse-Geisser corrections. The first ANOVA, which examined the effect of emotion condition on WTP for experiential creation items, again revealed the predicted main effect of emotion condition: Participants in the

awe (vs. happiness) condition were willing to pay more for the experiential creation products ( $p < .01$ ,  $\eta_p^2 = .12$ ). But importantly, there was no interaction effect ( $F(4.67, 401.47) = .77$ ,  $p = .56$ ), indicating that the main effect of emotion condition was not driven by a few specific items. The second ANOVA examined the effect of emotion condition on WTP for products that did not involve experiential creation, and revealed a nonsignificant main effect of emotion condition (as before, those in the awe and happiness conditions were equally willing to pay for these products;  $p = .22$ ) and a nonsignificant interaction ( $F(5.37, 461.73) = .73$ ,  $p = .61$ ), indicating that the nonsignificant main effect of emotion was not driven by a few specific items.

*Discussion.* Follow-up experiment A showed that the experience of awe affects consumers' willingness to pay for products that have an experiential creation component: People who were induced to feel awe, as opposed to happiness, were willing to pay more for experiential creation products. This effect was not limited to one product category, as it generalized to products in the furniture, arts and crafts, and food industries. Hence, using a new method of inducing emotions and a new set of experiential creation outcome measures, the findings of experiment A conceptually replicated those of experiment 1. Experiment A also provided a test of theory specificity. It showed that people in the awe and happiness conditions reported equivalent willingness to pay for not-experiential-creation products. This specificity test helps to rule out a key alternative explanation: that awe increases willingness to pay in general. That is not the case, as awe boosted willingness to pay only for products with an experiential creation component.

FIGURE A1



Notes: Effects of awe and happiness on willingness to pay for experiential creation products and products that are not experiential creation.

#### *FOLLOW-UP EXPERIMENTS B AND C*

Follow-up experiments B and C had several objectives. First, these studies aimed to extend the findings of experiment 4 and further demonstrate that awe's effect on openness to learning and experiential creation desire is not simply characteristic of all positive emotions by comparing awe to additional discreet positive emotions. Follow-up experiment B manipulated

awe (vs. pride vs. a neutral state) and experiment C manipulated awe (vs. amusement vs. a neutral state). Pride was selected as a comparison because although both awe and pride are positive and arousing, these emotions differ in terms of their elicitors insofar as awe (but not pride) is strongly linked to a need for accommodation (Shiota et al. 2007). Pride was also chosen because both awe and pride experiences could be seen as involving some kind of perceptual vastness—whereas awe is externally elicited by stimuli perceived as vast (e.g., panoramic views or novel architecture; Keltner and Haidt 2003; Shiota et al. 2007), pride is internally elicited by perceptions of great (i.e., vast) personal control, accomplishments, or abilities (Smith and Ellsworth 1985; Tracy and Robins 2004). Amusement was selected as a comparison because although both awe and amusement are positive and involve an incongruity between one's expectations and experience, an important difference between these emotions is that whereas the resolution of an incongruity is what serves as a key elicitor of amusement (Suls 1972; Wyer and Collins 1992), it is the lack of resolution of an incongruity and the accompanying need for accommodation (plus perceptual vastness) that are key for awe experiences (Keltner and Haidt 2003). Both pride and amusement were also selected because they are commonly used as positive emotions with which to contrast the effects of awe (Piff et al. 2015; Shiota et al. 2007; Valdesolo, Park, and Gottlieb 2016; Van Cappellen and Saroglou 2012).

Thus far, experiential creation desire has been measured using both actual choice behavior (experiments 1 and 2) as well as scenario-based measures (experiments A, 3, and 4). However, a possible limitation to these measures is that they measure experiential creation desire relatively indirectly, rather than more explicitly. Hence, a second objective of these follow-up studies was to obtain additional evidence of the proposed openness to learning mechanism and further demonstrate the generalizability of our predicted effects by measuring both general desire

to make or create things (a more explicit measure of experiential creation desire) and preferences for meals that require a high (vs. low) amount of experiential creation to prepare. In particular, we predicted a serial mediation: Participants who experienced awe (vs. happiness) would express a greater openness to learning, which would in turn increase their general desire to create, which would in turn lead them to exhibit a stronger preference for meals that required a high amount of experiential creation to prepare (vs. comparable meals low in experiential creation).

A third objective was to build upon the results of experiment 4 by further ruling out the alternative general motivation account (i.e., that awe is simply increasing general persistence or motivation to engage in any activity). Thus, in addition to measuring participants' desire to partake in experiential creation, we measured their desire to partake in another type of activity—exercise. Because our theory specifically relates awe to experiential creation desires, we predicted that awe (vs. pride or a neutral state in experiment B and vs. amusement or a neutral state in experiment C) would not significantly affect the desire to exercise. Last, a fourth objective was to test an alternative explanation for awe's ability to increase the desire for experiential creation. Because the experience of awe can lead to a diminished sense of self (i.e., feeling one's being and goals are less significant) relative to something deemed vaster than the individual (Piff et al. 2015), one could argue that the effect of awe on the desire to partake in experiential creation is not due to a greater openness to learning (as predicted), but instead due to a diminished sense of self. To address this alternative, our follow-up studies measured perceptions of a small self.

### *Participants and Procedure*

In follow-up experiment B, 155 university students (56.8% female;  $M_{\text{Age}} = 21.89$ ;  $SD_{\text{Age}} = 3.15$ ) participated for extra course credit. The experiment used a 3-cell (Emotion: Awe vs. Pride vs. Neutral) between-subjects design. In follow-up experiment C, 272 university students

(57% female;  $M_{\text{Age}} = 22.26$ ;  $SD_{\text{Age}} = 3.89$ ) participated for extra course credit. The experiment used a 3-cell (Emotion: Awe vs. Amusement vs. Neutral) between-subjects design.

As a cover story, participants in both studies were told they would complete several unrelated surveys. In the first survey of follow-up experiment B, emotions were manipulated by randomly assigning participants to one of three narrative recall conditions that induced specific emotions by having participants recall and write about a time when they were in a situation that is a prototypical elicitor of the target emotion. The specific instructions that participants received in each emotion condition were as follows (adapted from Piff et al. 2015). For the awe condition: “Please take a few minutes to think about a particular time, fairly recently, when you felt **awe**. This might have been a sunset, a view from a high place, or any other time you were in a natural setting that you felt was beautiful.” For the pride condition: “Please take a few minutes to think about a particular time, fairly recently, when you felt pride. This might have been being accepted to a university, winning an event or competition, or any other time that you achieved a personal accomplishment.” For the neutral condition: “Please take a few minutes to think about something you did fairly recently. This might have been driving a car, eating breakfast, or any other thing that happened during your day.” As in Piff et al. (2015), all participants were then asked to write at least five sentences describing the experience, their accompanying emotions, and what they were thinking about during the experience, providing as much detail as they can. In a post-study review of the written narratives, we ensured that all participants followed the instructions.

In the first survey of follow-up experiment C, emotions were manipulated (as in Valdesolo et al. 2016) by randomly assigning participants to watch a 5 minute neutral nature video (a short documentary about the relationship between the goby fish and the pistol shrimp that contains a monotone narration; <https://www.youtube.com/watch?v=8YFKdjtLozc>),

amusement-eliciting nature video (a montage of comedic nature clips from the BBC's *Walk on the Wild Side*; <https://www.youtube.com/watch?v=Kg1gK2E7dAQ>) or awe-eliciting nature video (a montage of scenic nature clips from the BBC's *Planet Earth*, which was primarily composed of grand, sweeping shots of plains, mountains, space, and canyons; [https://www.youtube.com/watch?v=RUp\\_P2g8sAc](https://www.youtube.com/watch?v=RUp_P2g8sAc)). All videos were in the content domain of nature to avoid potential confounds associated with merely priming nature concepts. Participants then reported how much they liked the video clip (1 = *not at all*, 7 = *very much*); how the video clip made them feel (1 = *very negative*, 7 = *very positive*); and "how surprising or unexpected" it was, "how novel or atypical" it was, and "how surprised" they were to see those images used in a nature video (1 = *not at all*, 7 = *very*; items were averaged;  $\alpha = .86$ ).

From this point forward, the procedures in experiments B and C were the same. In the second survey, participants imagined they were hungry and wanted something to eat, and then made five hypothetical choices between comparable meal options that were either high or low in experiential creation (i.e., "Make a bowl of homemade soup from 'scratch' on the stove" or "Microwave a bowl of canned soup"; "Bake a homemade cake or pie and eat a slice" or "Eat a slice of store-bought cake or pie"; "Mix up some batter, make a few pancakes on the stove, and then add your toppings of choice" or "Heat-up a few frozen pancakes in the toaster and then add your toppings of choice"; "Take a ready-made pizza crust, add sauce, cheese, and/or any other desired toppings, and bake it in the oven" or "Take a pre-made frozen pizza out of its box and bake it in the oven"; "Make a burrito by sautéing some fillings (e.g., meat or veggies), placing the cooked fillings in a tortilla, and adding any desired extras (e.g., beans, cheese, or salsa)" or "Heat-up a microwavable meat or veggie burrito"). The percentage of high experiential creation meals chosen by participants was our key dependent variable.



Participants then completed a 7-item experiential creation desire index (experiment B:  $\alpha = .92$ ; experiment C:  $\alpha = .94$ ) that measured their general desire to create (1 = *not at all*, 7 = *very much*): “I desire to make things with my hands,” “I think making things with my hands would be fun and enjoyable,” “I would like to fix or build things,” “I think my hands would be capable of creating meaningful and beautiful things,” “I would like to assemble parts or construct things,” “I want to create something,” and “I would like to draw, color, or trace something.” Participants also reported their general desire to exercise on a 9-item index (1 = *not at all*, 7 = *very much*; experiment B:  $\alpha = .88$ ; experiment C:  $\alpha = .81$ ): “I desire to exercise,” “I want to go for a run,” “I think exercising would be fun and enjoyable,” “I am interested in exercising,” “I would like to lift weights,” “I would like to do push-ups or sit-ups,” “I would like to go swimming,” “I would like to use a cardio machine (e.g., treadmill, elliptical, rowing, stationary bike),” and “I would like to participate in exercise-intensive sports (e.g., basketball, soccer, tennis, cycling).” Participants then completed the openness to learning index from experiment 3 (experiment B:  $\alpha = .86$ ; experiment C:  $\alpha = .86$ ) and a 10-item small self index (experiment B:  $\alpha = .89$ ; experiment C:  $\alpha = .80$ ; Piff et al. 2015). Last, participants reported the extent they currently felt “anger,” “fear,” “sadness,” “peacefulness,” “excitement,” “pride,” “awe,” “happiness,” “boredom,” “disgust,” “anxious,” “surprise,” “love,” and “amusement” (1 = *not at all*; 7 = *extremely*).

### *Results and Discussion*

*Manipulation checks.* For experiment B, one-way ANOVAs were conducted on the emotion items. They confirmed ( $F(2, 152) = 35.97, p < .01, \eta_p^2 = .32$ ) that participants in the awe condition ( $M = 4.22, SD = 2.03$ ) reported experiencing stronger feelings of awe during the experiment than did those in the pride condition ( $M = 1.96, SD = 1.29; t(152) = 7.29, p < .01$ ) or neutral condition ( $M = 1.90, SD = 1.30; t(152) = 7.42, p < .01$ ). The pride and neutral conditions

did not differ in their feelings of awe ( $t(152) = .20, p = .85$ ). The analyses also confirmed ( $F(2, 152) = 21.17, p < .01, \eta_p^2 = .22$ ) that participants in the pride condition ( $M = 5.49, SD = 1.50$ ) reported experiencing stronger pride than did those in the awe condition ( $M = 3.80, SD = 1.95; t(152) = 4.76, p < .01$ ) or neutral condition ( $M = 3.29, SD = 1.94; t(152) = 6.20, p < .01$ ). The awe and neutral conditions did not differ in their reported pride ( $t(152) = 1.43, p = .16$ ).

The conditions did not differ on the other reported emotions ( $t_s < 1.64, NS$ ), with the following exceptions. The neutral condition ( $M = 2.10, SD = 1.53$ ) produced marginally higher levels of sadness than the awe condition ( $M = 1.59, SD = 1.22; t(152) = 1.81, p = .07$ ) but not the pride condition ( $M = 1.81, SD = 1.49; t(152) = 1.03, p = .31$ ; though sadness was nevertheless low in all conditions), and the neutral condition ( $M = 1.90, SD = 1.47$ ) produced marginally higher levels of disgust than the awe ( $M = 1.49, SD = .95; t(152) = 1.74, p = .08$ ) but not the pride condition ( $M = 1.58, SD = 1.10; t(152) = 1.36, p = .18$ ; disgust was also nevertheless low in all conditions). The neutral condition ( $M = 4.37, SD = 1.87$ ) also produced lower levels of happiness than the pride condition ( $M = 5.13, SD = 1.76; t(152) = 2.09, p = .04$ ) but not the awe condition ( $M = 4.63, SD = 1.95; t(152) = 1.39, p = .17$ ), and the neutral condition ( $M = 3.61, SD = 1.69$ ) produced marginally lower levels of amusement than the pride ( $M = 4.23, SD = 1.76; t(152) = 1.75, p = .08$ ) and awe conditions ( $M = 4.22, SD = 1.96; t(152) = 1.70, p = .09$ ).

Together, these manipulation check analyses suggest that the awe and pride conditions successfully induced our target emotions, but not other emotions.

For experiment C, one-way ANOVAs were conducted on the emotion items. They confirmed ( $F(2, 269) = 83.32, p < .01, \eta_p^2 = .15$ ) that participants in the awe condition ( $M = 4.81, SD = 1.94$ ) reported experiencing stronger feelings of awe during the experiment than did those in the amusement condition ( $M = 3.01, SD = 1.80; t(269) = 6.53, p < .01$ ) or neutral condition

( $M = 3.33$ ,  $SD = 1.81$ ;  $t(269) = 5.41$ ,  $p < .01$ ). The amusement and neutral conditions did not differ in their feelings of awe ( $t(269) = 1.15$ ,  $p = .25$ ). The analyses also confirmed ( $F(2, 269) = 31.78$ ,  $p < .01$ ,  $\eta_p^2 = .06$ ) that participants in the amusement condition ( $M = 4.80$ ,  $SD = 2.04$ ) experienced stronger amusement than did those in the awe condition ( $M = 4.01$ ,  $SD = 1.81$ ;  $t(269) = 2.78$ ,  $p = .01$ ) or neutral condition ( $M = 3.64$ ,  $SD = 1.85$ ;  $t(269) = 4.11$ ,  $p < .01$ ). The awe and neutral conditions did not differ in their feelings of amusement ( $t(269) = 1.31$ ,  $p = .19$ ).

The conditions did not differ on the other reported emotions ( $ts < 1.61$ , NS), with the following exception. The neutral condition ( $M = 1.72$ ,  $SD = 1.25$ ) produced marginally higher levels of fear than the amusement condition ( $M = 1.43$ ,  $SD = .94$ ;  $t(269) = 1.71$ ,  $p = .09$ ) but not the awe condition ( $M = 1.57$ ,  $SD = 1.15$ ;  $t(269) = .91$ ,  $p = .37$ ; though fear was nevertheless low in all conditions). Finally, the extent to which the ads made participants feel positive (vs. negative) varied by condition ( $F(2, 269) = 15.77$ ,  $p < .01$ ,  $\eta_p^2 = .11$ ), such that our awe ( $M = 5.77$ ,  $SD = 1.31$ ) and amusement conditions ( $M = 5.83$ ,  $SD = 1.42$ ) made participants feel more positive than our neutral condition ( $M = 4.84$ ,  $SD = 1.29$ ; Awe vs. Neutral:  $t(269) = 4.68$ ,  $p < .01$ ; Amusement vs. Neutral:  $t(269) = 5.02$ ,  $p < .01$ ), but they did not differ from one another ( $t(269) = .33$ ,  $p = .74$ ). These analyses suggest that the awe and amusement conditions induced our target emotions but not other emotions, and did not differ from one another in terms of general positivity. Moreover, neither the extent to which participants liked the video clip ( $ts < 1.17$ , NS) or thought the images in the video were unexpected, atypical, or surprising for a nature video ( $ts < .96$ , NS) significantly differed across conditions.

*Openness to learning.* For both follow-up experiment B and C, we conducted a one-way ANOVA on the openness to learning index. As predicted, the results for experiment B revealed that participants in the awe condition ( $M = 6.23$ ,  $SD = .81$ ) versus the pride condition ( $M = 5.36$ ,

SD = 1.43;  $t(152) = 3.61, p < .01$ ) or versus the neutral condition (M = 5.40, SD = 1.33;  $t(152) = 3.43, p < .01$ ) currently felt more open to the prospect of learning ( $F(2, 152) = 8.26, p < .01, \eta_p^2 = .10$ ). Similarly, the results for experiment C revealed that participants in the awe condition (M = 6.01, SD = 1.05) versus the amusement condition (M = 5.58, SD = 1.27;  $t(269) = 2.47, p = .01$ ) or versus the neutral condition (M = 5.60, SD = 1.11;  $t(269) = 2.39, p = .02$ ) currently felt more open to the prospect of learning ( $F(2, 269) = 3.93, p = .02, \eta_p^2 = .03$ ).

*Experiential creation desires and meal preferences.* To test whether awe altered experiential creation desires, we conducted one-way ANOVAs on both the general experiential creation desires index and the percentage of high experiential creation meals selected. Both outcomes showed similar patterns in follow-up experiments B and C. For the experiential creation desires index in experiment B, the results revealed that, as predicted, participants in the awe condition (M = 4.74, SD = 1.41) versus the pride condition (M = 4.05, SD = 1.65;  $t(152) = 2.29, p = .02$ ) or versus the neutral condition (M = 4.08, SD = 1.55;  $t(152) = 2.17, p = .03$ ) reported a greater general desire to make or create things ( $F(2, 152) = 3.31, p = .04, \eta_p^2 = .04$ ). Also as predicted, the results of experiment B revealed that participants in the awe condition (M = 43.14%, SD = 26.04%) versus the pride condition (M = 27.92%, SD = 19.35%;  $t(152) = 3.45, p < .01$ ) or versus the neutral condition (M = 26.63%, SD = 21.64%;  $t(152) = 3.26, p < .01$ ) more strongly favored the high experiential creation meals ( $F(2, 152) = 7.50, p < .01, \eta_p^2 = .09$ ).

For the experiential creation desires index in experiment C, the results revealed that, as predicted, participants in the awe condition (M = 5.03, SD = 1.22) versus the amusement condition (M = 4.38, SD = 1.71;  $t(269) = 3.02, p < .01$ ) or versus the neutral condition (M = 4.36, SD = 1.39;  $t(269) = 3.10, p < .01$ ) reported a greater general desire to make or create things ( $F(2, 269) = 6.24, p < .01, \eta_p^2 = .04$ ). Also as predicted, the results of experiment C revealed that

participants in the awe condition ( $M = 58.89\%$ ,  $SD = 21.49\%$ ) versus the amusement condition ( $M = 50.00\%$ ,  $SD = 25.48\%$ ;  $t(269) = 2.54$ ,  $p = .01$ ) or versus the neutral condition ( $M = 50.43\%$ ,  $SD = 23.44\%$ ;  $t(269) = 2.42$ ,  $p = .02$ ) more strongly favored the high experiential creation meals ( $F(2, 269) = 4.10$ ,  $p = .02$ ,  $\eta_p^2 = .03$ ).

*Exercise desires.* To test whether awe also altered participants' desire to exercise, we conducted a one-way ANOVA on the general exercise desires index for both follow-up experiment B and C. Supporting our theory's specificity, the results for experiment B revealed that participants in the awe condition ( $M = 4.17$ ,  $SD = 1.44$ ), pride condition ( $M = 4.48$ ,  $SD = 1.44$ ), and neutral condition ( $M = 4.04$ ,  $SD = 1.26$ ) currently expressed an equal desire to exercise ( $F(2, 152) = 1.41$ ,  $p = .25$ ;  $t_s < 1.63$ , NS). Similarly, the results for experiment C revealed that participants in the awe condition ( $M = 4.43$ ,  $SD = 1.28$ ), amusement condition ( $M = 4.24$ ,  $SD = 1.31$ ), and neutral condition ( $M = 4.45$ ,  $SD = 1.16$ ) currently expressed an equal desire to exercise ( $F(2, 269) = .76$ ,  $p = .47$ ;  $t_s < 1.14$ , NS).

*Small self perceptions.* To test if awe altered perceptions of a small self, we conducted a one-way ANOVA on the small self index for both follow-up experiment B and C. In line with prior work (Piff et al. 2015), the analyses for experiment B revealed that participants in the awe condition ( $M = 3.84$ ,  $SD = 1.14$ ) versus the pride condition ( $M = 3.20$ ,  $SD = 1.30$ ;  $t(152) = 2.63$ ,  $p = .01$ ) or versus the neutral condition ( $M = 3.28$ ,  $SD = 1.26$ ;  $t(152) = 2.26$ ,  $p = .03$ ) reported feeling a more diminished sense of self ( $F(2, 152) = 4.03$ ,  $p = .02$ ,  $\eta_p^2 = .05$ ). Similarly, the results for follow-up experiment C revealed that participants in the awe condition ( $M = 4.31$ ,  $SD = 1.03$ ) versus the amusement condition ( $M = 3.90$ ,  $SD = .98$ ;  $t(269) = 2.61$ ,  $p = .01$ ) or versus the neutral condition ( $M = 3.93$ ,  $SD = 1.15$ ;  $t(269) = 2.43$ ,  $p = .02$ ) reported feeling a more diminished sense of self ( $F(2, 269) = 4.24$ ,  $p = .02$ ,  $\eta_p^2 = .03$ ).

*Serial mediation analyses.* Using PROCESS model 6 in SPSS (10,000 resamples; Hayes 2013) and following the procedures recommended in Hayes and Preacher (2014) for performing mediation analyses with multi-categorical independent variables, we conducted serial mediation analyses to test our predicted model: emotion condition → openness to learning → general desire for experiential creation → meal preferences. For experiment B, the first analysis included emotion condition (pride = 0, awe = 1) as the independent variable, the openness to learning index as the first mediator, the general experiential creation desires index as the second mediator, and the percentage of high experiential creation meals chosen as the dependent variable. The remaining emotion condition—the neutral condition—was included as a covariate. To rule out the possibility that one’s sense of the size of one’s self was the true mechanism underlying awe’s ability to alter experiential creation desires, the small self index was also included as a covariate. The second analysis for experiment B was the same, except that emotion condition (neutral = 0, awe = 1) was the independent variable and the pride condition was included as a covariate.

For these two analyses, bootstrapping generated bias-corrected confidence intervals for both the total indirect effect (i.e., total mediated effect) and the specific indirect effects. The results revealed, for both analyses, that the total indirect effect was indeed significant (Pride vs. Awe:  $b = 5.36$ ; 95% CI: [2.18, 9.70]; Neutral vs. Awe:  $b = 5.14$ ; 95% CI: [2.09, 9.37]). In particular, the results for both analyses revealed the predicted serial mediation: The indirect effect from emotion condition to meal preferences through both mediators (i.e., openness to learning and general desire to create) was significant (Pride vs. Awe:  $b = 1.55$ ; 95% CI: [.38, 3.86]; Neutral vs. Awe:  $b = 1.49$ ; 95% CI: [.36, 3.82]). In sum, these analyses revealed that, even controlling for the effect of small self perceptions, experiencing awe (vs. pride or vs. a neutral state) affected people’s preferences for high experiential creation meals by influencing their

openness to learning and general desire to create. Participants in the awe (vs. pride or vs. neutral) condition were more open to learning, which made them more strongly desire to make or create things, which led them to exhibit stronger preferences for meals high in experiential creation. Notably, two additional serial mediation analyses were conducted to further rule out the alternative small self account. These analyses were the same as the two analyses described above, except that the small self index was included as the first mediator while the openness to learning index was instead included as the covariate. The results revealed that, when controlling for the effect of openness to learning, the serial indirect effect from emotion condition to meal preferences through both perceptions of a small self and general desire to create was not significant (Pride vs. Awe: 95% CI: [-.09, .29]; Neutral vs. Awe: 95% CI: [-.58, .20]).

For experiment C, the first analysis included emotion condition (amusement = 0, awe = 1) as the independent variable, the openness to learning index as the first mediator, the general experiential creation desires index as the second mediator, and the percentage of high experiential creation meals chosen as the dependent variable. The remaining emotion condition—the neutral condition—was included as a covariate. To rule out the possibility that one's sense of the size of one's self was the true mechanism underlying awe's ability to alter experiential creation desires, the small self index was also included as a covariate. The second analysis for experiment C was the same, except that emotion condition (neutral = 0, awe = 1) was the independent variable and the amusement condition was included as a covariate.

For these two analyses, bootstrapping generated bias-corrected confidence intervals for both the total indirect (i.e., mediated) effect and the specific indirect effects. For both analyses, that the total indirect effect was indeed significant (Amusement vs. Awe:  $b = 4.46$ ; 95% CI: [1.59, 7.94]; Neutral vs. Awe:  $b = 4.56$ ; 95% CI: [2.07, 7.83]). In particular, the results for both

analyses revealed the predicted serial mediation: The indirect effect from emotion condition to meal preferences through both mediators (i.e., openness to learning and general desire to create) was significant (Amusement vs. Awe:  $b = 1.21$ ; 95% CI: [.15, 2.67]; Neutral vs. Awe:  $b = 1.18$ ; 95% CI: [.20, 2.61]). In sum, these analyses revealed that, even controlling for the effect of small self perceptions, experiencing awe (vs. amusement or vs. a neutral state) affected people's preferences for high experiential creation meals by influencing their openness to learning and general desire to create. Participants in the awe (vs. amusement or vs. neutral) condition were more open to learning, which made them more strongly desire to make or create things, which led them to exhibit stronger preferences for meals high in experiential creation. Notably, two additional serial mediation analyses were conducted to further rule out the alternative small self account. These analyses were the same as the two analyses described above, except that the small self index was included as the first mediator while the openness to learning index was instead included as the covariate. The results revealed that, when controlling for the effect of openness to learning, the serial indirect effect from emotion condition to meal preferences through both perceptions of a small self and general desire to create was not significant (Amusement vs. Awe: 95% CI: [-.69, .31]; Neutral vs. Awe: 95% CI: [-.67, .26]).

*Discussion.* Comparing awe to additional discrete positive emotions (as well as a neutral state), and using a more explicit measure of experiential creation desires along with a scenario-based choice measure, follow-up experiments B and C offered additional support for the prediction that awe increases experiential creation desires. People induced to feel awe (vs. pride or vs. amusement or vs. a neutral state) expressed a stronger general interest in creating and were more likely to choose meals that required more experiential creation to prepare. Experiments B and C also provided additional evidence for the mechanism underlying this effect. In line with



our theory (and the results of experiments 2, 3, and 4), participants in the awe (vs. pride or vs. amusement or vs. neutral) conditions also felt more open to learning. Importantly, serial mediation analyses showed that the greater openness to learning experienced by participants in the awe (vs. pride or vs. amusement or vs. neutral) conditions drove their stronger general desire to create, which in turn enhanced their preferences for high experiential creation meals.

Follow-up experiments B and C also helped rule out several alternative accounts. Supporting our theory's specificity, both studies showed that participants in the awe condition did not express a significantly different desire to exercise than did participants in the other emotion conditions. Thus, the greater general desire to make or create things and the greater preference for experiential creation meals expressed by participants in the awe (vs. pride or vs. amusement or vs. neutral) conditions could not be explained by awe simply boosting people's general motivation (e.g., to engage in any activity). Moreover, although perceptions of a small self did differ across conditions—such that those in the awe (vs. pride or vs. amusement or vs. neutral) conditions felt a diminished sense of self—mediation analyses revealed that small self perceptions could not account for awe's effect on experiential creation desire. Together, these results offer added support for the proposed openness to learning mechanism.

#### *POST-TEST EXPERIENTIAL CREATION DEFINITION*

Based on the prior research of Dahl and Moreau (2007), we define experiential creation as all activities in which a consumer actively produces an outcome (where “produces” refers to the physical act of making or creating and “actively” means that the consumer plays a direct, active [vs. indirect, passive] role in creating [i.e., consumers see themselves as an agent of the

creation experience rather than a passive bystander]). This outcome-focused definition of experiential creation allows for a continuum of experiential creation that includes activities that can be either high or low in the amount of instructions involved and activities that involve either a well-defined target outcome (in which improvisation is discouraged) or no target outcome at all (in which improvisation is required). To empirically address the questions of whether consumers are able to discriminate between what is and is not experiential creation and whether the effects observed in the present research are limited only to experiential creation that possesses certain combinations of high (vs. low) instructions and high (vs. low) definition of target outcome, we conducted a post-test using consumers from an online panel ( $N = 101$ ;  $M_{Age} = 39.23$ ,  $SD_{Age} = 12.65$ , 56% females).

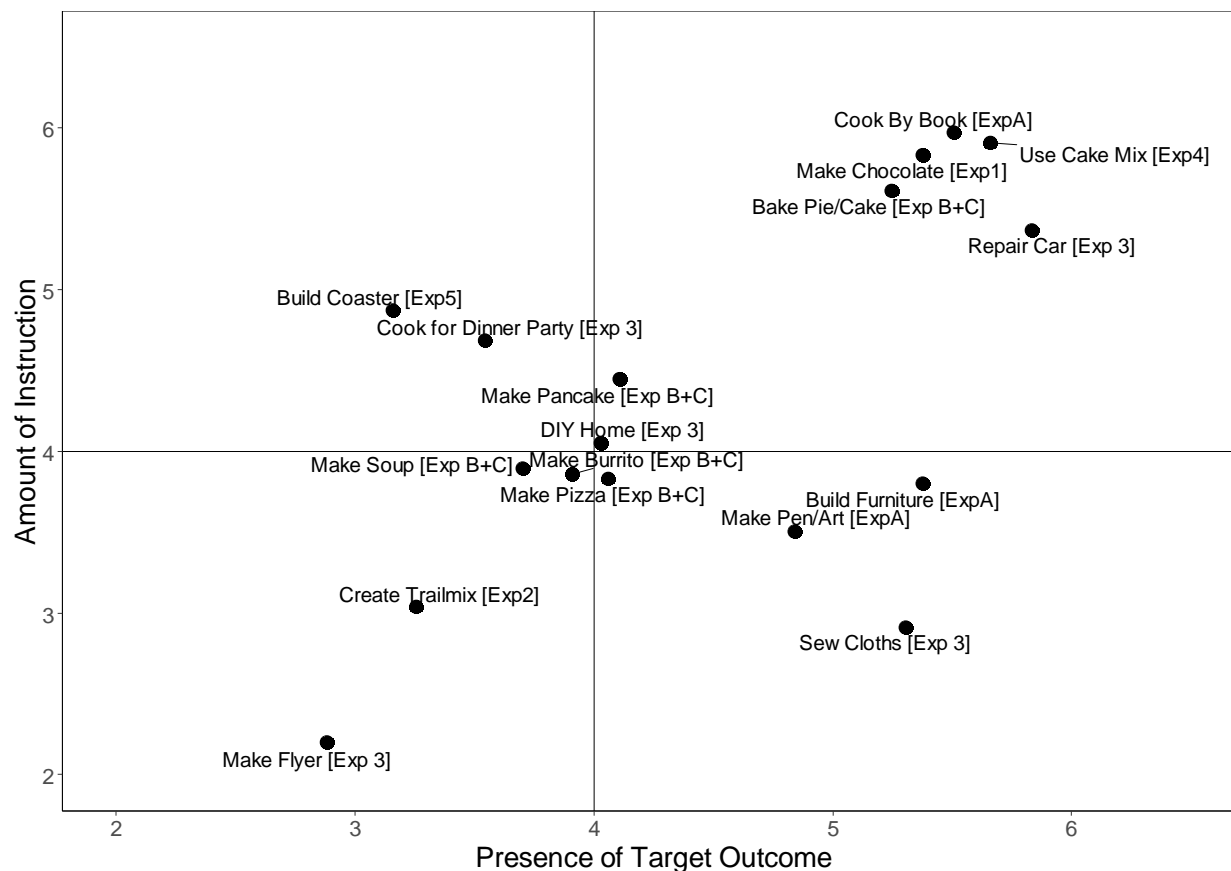
In this post-test, participants were first shown our definition of experiential creation (i.e., all activities in which someone actively produces an outcome). Second, we presented to participants (in random order) a semantic differential of all pairs of activities used throughout our experiments (e.g., purchasing a pre-made chocolate vs. making a chocolate yourself [experiment 1], having a mechanic doing some general car maintenance vs. doing the car maintenance yourself [experiment 3]). Participants were asked to rate each pair on a 7-point semantic differential scale (with a midpoint of zero) using the following instructions: “For each pair of activities, please indicate the behavior you perceive as high in experiential creation. If you think both activities are equally high in experiential creation, choose the midpoint of the scale; if you think one activity is more experiential-creation-oriented than the other, select a scale point that is leaning toward that activity”). After this task, participants were again shown (separately and in random order) each activity/behavior/product that we had previously identified (in our experiments) as being experiential creation, and were asked to use 7-point scales to rate each

activity/behavior/product on the two dimensions of the continuum of experiential creation identified by Dahl and Moreau (2007): high/low instructions; target outcome present/absent.

For the semantic differential pairings, we coded the behaviors/activities that received positive number scores (1 to 3) as experiential creation and behaviors/activities that received negative number scores (-3 to -1) as not experiential creation. Notably, all behaviors/activities that we had labeled in our experiments as experiential creation received positive number scores, and all behaviors/activities that we had labeled in our experiments as not experiential creation received negative number scores. To test whether consumers can empirically discriminate experiential creation from things that are not experiential creation, we then averaged across all the behaviors/activities coded as experiential creation and tested the arithmetic mean against zero. These analyses provide strong evidence that consumers perceived all the experiential creation behaviors/activities used in our studies as being substantially more experiential creation-oriented vs. not experiential creation-oriented ( $M = 5.94$ ,  $t(100) = 53.935$ ,  $p < .01$ ), and no significant differences were found across all our experiential creation behaviors (all  $ps > .89$ ). In short, we find consistent evidence that consumers can discriminate between what is and is not experiential creation using the conceptual definition of experiential creation.

For the continuum of experiential creation results, we calculated the average scores that each experiential creation behavior received on the high/low instructions factor and on the target outcome present/absent factor and graphically depicted the results (see Figure A2). In short, we find that awe's effects on experiential creation are not limited to certain portions of the continuum of experiential creation, as we observed this effect with experiential creation activities that fell within each of the four quadrants (no difference in proportions:  $\chi^2(1) = .83$ ,  $p > .36$ ).

FIGURE A2



Note: This figure illustrates the bivariate distribution of experiential creation options across experiments by presence of target outcome and amount of instructions; solid horizontal and vertical lines indicate scale mid-points.

#### *POST-TEST TV COMMERCIAL AND SLIDESHOW MANIPULATIONS*

In many of our experiments (with the exception of follow-up experiment B and experiment 2), emotions were manipulated by exposing participants to various images (i.e., images contained in TV commercials in experiments 1 and 3, picture slideshows comprised of images in experiments A and 5, print ads that featured images in experiment 4, and images contained in nature videos in follow-up experiment C). Consequently, we wanted to rule out the possibility that our observed effects in these experiments were driven not by awe enhancing

openness to learning (as predicted), but instead due to participants potentially perceiving that the images used in these awe manipulations were more disconnected from (or atypical for) the contexts in which they were viewed (e.g., that participants viewed the images in the awe [vs. happiness or neutral] commercial as more atypical or surprising to see in an ad for an LCD television or that participants viewed the images in the awe [vs. happiness] slideshow as more atypical or surprising to see in a picture slideshow). To do so, we conducted two post-tests for the commercial and picture slideshow manipulations, the results of which are detailed below. Additionally, the typicality of the images used in the print ad stimuli were measured as part of experiment 4 (see the main text for details) and the typicality of the images in the nature videos were measured as part of follow-up experiment C (see web appendix section “Follow-Up Experiments B and C” for details).

#### *Participants and Procedure*

For the TV commercial post-test, 114 individuals from Amazon’s Mechanical Turk participated ( $M_{\text{Age}} = 40.16$ ,  $SD_{\text{Age}} = 12.10$ , 49% female). Mirroring the experimental paradigm and stimuli used in experiments 1 and 3, participants were randomly assigned to watch either the awe-eliciting, happiness-eliciting, or neutral 60-second commercial for an LCD television. Afterwards, participants answered a multi-item measure to assess their perceptions of the typicality or unexpectedness of seeing those images used in a commercial for an LCD television (“How surprising or unexpected was it for those images to be used in a commercial for an LCD television?”, “How novel or atypical was it for those images to be used in a commercial for an LCD television?”, “How surprised were you to see those images used in a commercial for an LCD television?”, 1 = *not at all*; 7 = *very*;  $\alpha = .85$ ).

For the picture slideshow post-test, 98 university students participated as part of an unrelated lab study in exchange for extra course credit ( $M_{\text{Age}} = 23.58$ ,  $SD_{\text{Age}} = 2.04$ , 44% female). Mirroring the experimental paradigm and stimuli used in experiments A and 5, participants were randomly assigned to watch either the awe-eliciting or happiness-eliciting picture slideshow. Participants then answered a multi-item measure to assess their perceptions of the typicality or unexpectedness of seeing those images used in a picture slideshow (“How surprising or unexpected was it for those images to be used in a picture slideshow?”, “How novel or atypical was it for those images to be used in a picture slideshow?”, “How surprised were you to see those images used in a picture slideshow?”, 1 = *not at all*; 7 = *very*;  $\alpha = .81$ ).

### *Results and Discussion*

For the TV commercial post-test, a one-way ANOVA ( $F(2, 111) = 2.38$ ,  $p = .10$ ) revealed that there were no significant differences in perceptions of image typicality between either participants who watched the awe-eliciting versus happiness-eliciting commercial ( $M_{\text{Awe}} = 4.16$  vs.  $M_{\text{Happiness}} = 4.41$ ,  $p = .77$ ), or participants who watched the awe-eliciting vs. neutral commercial ( $M_{\text{Awe}} = 4.16$  vs.  $M_{\text{Neutral}} = 3.66$ ,  $p = .35$ ). However, participants who watched the neutral commercial perceived the images as marginally less surprising than did participants who watched the happiness-eliciting commercial ( $p = .09$ ). For the picture slideshow post-test, a one-way ANOVA revealed that participants in both conditions perceived the images used in the slideshows as equally surprising ( $F(1, 96) = .43$ ,  $p = .66$ ). Together, the results of these post-tests provide evidence that the effects observed in experiments 1, A, 3, and 5 were not inadvertently driven by differences in participants’ perceptions of the atypicality or surprisingness of the images they saw in the LCD TV commercials or picture slideshows.

*ORDER EFFECT ANALYSES: EXPERIMENTS 4, B, AND C*

Experiments 4, B, and C provided a test of theory specificity and offered evidence against the alternative explanation that the experience of awe simply increases general motivation (i.e., motivation to exert effort in any domain) as opposed to our prediction that it increases the desire to engage in experiential creation specifically. Across these experiments, however, the logistics of the study designs were such that participants' motivation to engage in experiential creation was measured before measuring general motivation (i.e., task persistence in experiment 4 and desire to exercise in follow-up experiments B and C). Thus, we conducted supplementary analyses in order to assuage concerns about potential order effects. Namely, concerns that participants having first responded to our measure of experiential creation desire is what led to the nonsignificant task persistence and desire to exercise results (e.g., due to the possibility that our measures of experiential creation desire and our measures of general task persistence/desire to exercise might be capturing the same underlying construct or be inversely correlated).

To test whether our measure of participants' specific motivation to engage in experiential creation and our measures of their general motivation (to persist in experiment 4 and to exercise in experiments B and C) are indeed distinct (and that participants' responses to our experiential creation desire measure were not inversely correlated with and influencing their responses to our general motivation measure), we first assessed the discriminant validity between the motivation constructs by estimating a two-factor model for each motivation measure and testing this model against a single-factor model with all items loading on the same factor (Bagozzi, Yi, and Phillips 1991). The results for experiments 4, B, and C revealed a significant chi-square difference test, indicating the superiority of the two-factor versus single-factor model (experiment 4:

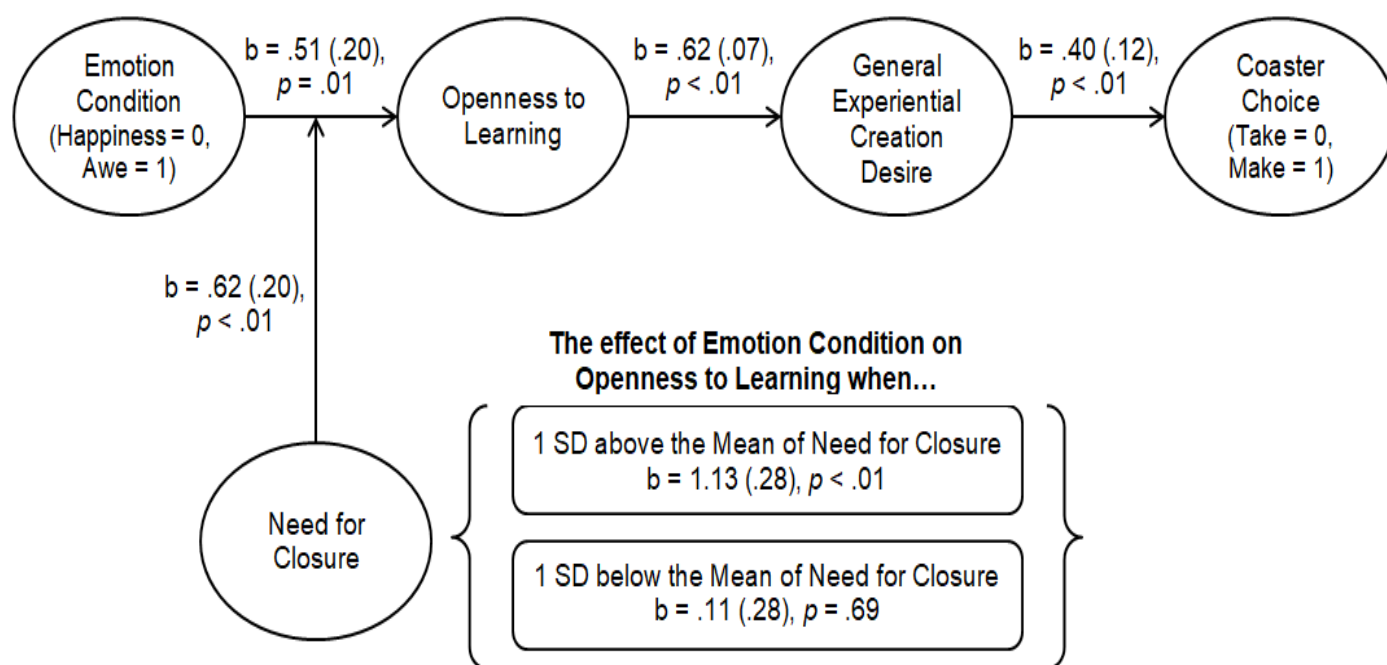
$\chi^2_{\Delta}(1) = 663.14, p < .001$ ; experiment B:  $\chi^2_{\Delta}(1) = 511.52, p < .001$ ; experiment C:  $\chi^2_{\Delta}(1) = 572.94, p < .001$ ), as well as smaller information criteria in favor of the two-factor model (experiment 4:  $BIC_{TwoFactor} = 15554$  vs.  $BIC_{SingleFactor} = 16212$ ; experiment B:  $BIC_{TwoFactor} = 9173$  vs.  $BIC_{SingleFactor} = 9680$ ; experiment C:  $BIC_{TwoFactor} = 15718$  vs.  $BIC_{SingleFactor} = 16286$ ). Second, following Fornell and Larcker (1981), discriminant validity was also supported when comparing the constructs' average variance extracted (AVE) with the squared correlation of the motivation measures across studies (experiment 4:  $AVE_{CreationMotivation} = .80, AVE_{GeneralMotivation} = .49; r^2 = .003$ ; experiment B:  $AVE_{CreationMotivation} = .64, AVE_{ExerciseMotivation} = .53; r^2 = .002$ ; experiment C:  $AVE_{CreationMotivation} = .69, AVE_{ExerciseMotivation} = .36; r^2 = .095$ ). Third, we estimated the bootstrapped correlation coefficients (5,000 iterations) using R. All results showed that the 95% confidence interval did not include either 1 or -1 (experiment 4 95% CI = [-.18, .07]; experiment B 95% CI = [-.13, .22]; experiment C 95% CI = [.19, .43]), indicating the measures of experiential creation desire and general motivation are distinct (Bagozzi et al. 1991).

Taken together, these analyses serve to reduce concerns that the null task persistence (experiment 4) and desire to exercise (experiments B and C) results observed in our studies were due to ordering effects, as it was demonstrated that these measures of general motivation and our measure of participants' desire for experiential creation did indeed reflect distinct constructs and were not highly or inversely correlated. However, we do acknowledge that potential ordering effects could be more deeply examined in future research by either counter-balancing the sequence of motivation measures during experiments or by using experimental designs that measure one type of motivation exclusively (i.e., measuring specific vs. general motivation between subjects) to avoid any potential carry-over effects between measures.



*MODERATED SERIAL MEDIATION FULL ILLUSTRATION: EXPERIMENT 5*

The following illustration depicts the mediating effect of openness to learning on general creation desire and coaster choice as a function of dispositional need for closure:



Notes: Numbers in parentheses indicate standard errors. Indirect effect of experiencing awe (vs. happiness) on decision to make (vs. take) a coaster is  $b = .28$  (CI: [.07, .60]) at one standard deviation above the mean of need for closure and  $b = -.03$  (CI: [-.23, .16]) at one standard deviation below the mean of need for closure.

*DISCRIMINANT VALIDITY TESTS EXPERIMENT 5*

The results of our analyses in the main text (for experiment 5) revealed that need for closure did not have a significant main effect on openness to learning ( $F(1, 191) = .73, p = .39$ ), general creation desires ( $F(1, 191) = .09, p = .97$ ), or coaster choice (Wald = .10;  $p = .76$ ). Moreover, in contrast to the openness to learning construct, need for closure did not have a

significant main effect on general creation desires ( $b = -.19$ , 95% CI:  $[-.47, .10]$ ) or coaster choice ( $b = -.30$ , 95% CI:  $[-.77, .16]$ ) in the moderated serial mediation analysis. These results offer support for the notion that need for closure (NFC) is not simply the inverse of openness to learning (i.e., that need for closure and openness to learning do not reflect the same underlying construct). However, to provide further support for the distinctness of these two constructs, we conducted a series of discriminant validity tests.

First, to assess the discriminant validity between the constructs, we estimated and tested a two-factor model for each construct against a single-factor model with all items loading on the same factor (Bagozzi, Yi, and Phillips 1991). The results revealed a significant chi-square difference test, indicating the superiority of the two-factor versus single-factor model ( $\chi^2_{\Delta}(1) = 333.82$ ,  $p < .001$ ), and smaller information criteria in favor of the two-factor model ( $BIC_{TwoFactor} = 12265$  vs.  $BIC_{SingleFactor} = 11936$ ). Second, following Fornell and Larcker (1981), discriminant validity was also supported when comparing the constructs' average variance extracted (AVE) with the squared correlation of the two constructs ( $AVE_{OpennessLearning} = .59$ ,  $AVE_{NFC} = .45$ ;  $r^2 = .004$ ). Third, we estimated the bootstrapped correlation coefficients (5,000 iterations) using the 'boot' package in R. The results revealed that the confidence interval did not include either 1 or -1 (95% CI =  $[-.15, .27]$ ), indicating that the two constructs are indeed distinct (Bagozzi et al. 1991). Taken together, these analyses rule out the possibility that need for closure is simply the inverse of (or too highly correlated with) openness to learning and offer evidence that our measures of need for closure and openness to learning reflect distinct constructs.

*FULL STATISTICS EMOTION MANIPULATION CHECKS ACROSS STUDIES*

| <u>Experiment 1</u> |                            |                                  |                                    |                                      |                                |                                |                                  |                                    |
|---------------------|----------------------------|----------------------------------|------------------------------------|--------------------------------------|--------------------------------|--------------------------------|----------------------------------|------------------------------------|
| <u>Emotion</u>      | <u>Statistics</u>          |                                  |                                    |                                      | <u>Significance (p-values)</u> |                                |                                  |                                    |
|                     | <u>Overall</u><br><u>F</u> | <u>Awe vs.</u><br><u>Happy t</u> | <u>Awe vs.</u><br><u>Neutral t</u> | <u>Happy vs.</u><br><u>Neutral t</u> | <u>Overall</u><br><u>F</u>     | <u>Awe vs.</u><br><u>Happy</u> | <u>Awe vs.</u><br><u>Neutral</u> | <u>Happy vs.</u><br><u>Neutral</u> |
| Fear                | 1.66                       | 1.50                             | -.15                               | -1.63                                | .19                            | .14                            | .88                              | .11                                |
| Sadness             | .89                        | 1.07                             | 1.22                               | .17                                  | .41                            | .29                            | .23                              | .87                                |
| Pride               | .10                        | .44                              | .16                                | -.27                                 | .91                            | .66                            | .88                              | .79                                |
| Awe                 | 27.70                      | -7.05                            | -5.55                              | 1.35                                 | < .01                          | < .01                          | < .01                            | .18                                |
| Excitement          | .61                        | -.64                             | -1.10                              | -.48                                 | .54                            | .52                            | .27                              | .63                                |
| Peacefulness        | .30                        | -.44                             | -.78                               | -.35                                 | .74                            | .66                            | .44                              | .73                                |
| Happiness           | 7.34                       | 3.63                             | .72                                | -2.84                                | < .01                          | < .01                          | .47                              | .01                                |
| Boredom             | .23                        | .60                              | .01                                | -.58                                 | .79                            | .55                            | .99                              | .57                                |

| <u>Follow-up Experiment A</u> |                        |                                |
|-------------------------------|------------------------|--------------------------------|
| <u>Emotion</u>                | <u>Statistics (Fs)</u> | <u>Significance (p-values)</u> |
| Fear                          | 2.44                   | .12                            |
| Sadness                       | .38                    | .54                            |
| Pride                         | 1.84                   | .18                            |
| Awe                           | 51.62                  | < .01                          |
| Excitement                    | 1.05                   | .31                            |
| Peacefulness                  | 1.99                   | .16                            |
| Happiness                     | 9.99                   | < .01                          |
| Boredom                       | .55                    | .46                            |

| <u>Experiment 2</u> |                        |                                |
|---------------------|------------------------|--------------------------------|
| <u>Emotion</u>      | <u>Statistics (Fs)</u> | <u>Significance (p-values)</u> |
| Awe                 | 76.29                  | < .01                          |

| <u>Experiment 3</u> |                        |                                |
|---------------------|------------------------|--------------------------------|
| <u>Emotion</u>      | <u>Statistics (Fs)</u> | <u>Significance (p-values)</u> |
| Anger               | .12                    | .73                            |
| Fear                | .03                    | .86                            |
| Sadness             | .05                    | .82                            |
| Pride               | .87                    | .35                            |
| Awe                 | 26.85                  | < .01                          |
| Excitement          | .95                    | .33                            |
| Peacefulness        | 1.33                   | .25                            |
| Happiness           | 7.85                   | .01                            |
| Boredom             | .70                    | .41                            |

| <u>Experiment 4</u> |                            |                                    |                                    |  |                                |                                  |                                  |                                      |
|---------------------|----------------------------|------------------------------------|------------------------------------|--|--------------------------------|----------------------------------|----------------------------------|--------------------------------------|
| <u>Emotion</u>      | <u>Statistics</u>          |                                    |                                    |  | <u>Significance (p-values)</u> |                                  |                                  |                                      |
|                     | <u>Overall</u><br><u>F</u> | <u>Awe vs.</u><br><u>Excited t</u> | <u>Awe vs.</u><br><u>Neutral t</u> | <u>Excited vs.</u><br><u>Neutral t</u> | <u>Overall</u><br><u>F</u>     | <u>Awe vs.</u><br><u>Excited</u> | <u>Awe vs.</u><br><u>Neutral</u> | <u>Excited vs.</u><br><u>Neutral</u> |
| Anger               | 1.92                       | .51                                | 1.88                               | 1.39                                   | .15                            | .61                              | .06                              | .17                                  |
| Fear                | .36                        | .84                                | .46                                | -.39                                   | .70                            | .40                              | .64                              | .70                                  |
| Sadness             | .62                        | -.28                               | .78                                | 1.08                                   | .54                            | .78                              | .43                              | .28                                  |
| Awe                 | 18.43                      | -5.35                              | -5.22                              | .16                                    | < .01                          | < .01                            | < .01                            | .87                                  |
| Peacefulness        | .38                        | .82                                | .66                                | -.16                                   | .69                            | .41                              | .51                              | .87                                  |
| Excitement          | 7.16                       | 2.46                               | -1.20                              | -3.72                                  | < .01                          | .01                              | .23                              | < .01                                |

|           |      |       |      |       |     |      |     |      |
|-----------|------|-------|------|-------|-----|------|-----|------|
| Pride     | .63  | < .01 | -.96 | -.97  | .53 | 1.00 | .34 | .33  |
| Happiness | .27  | .32   | -.40 | -.73  | .77 | .75  | .69 | .47  |
| Boredom   | 2.42 | .06   | 1.91 | 1.88  | .09 | .95  | .06 | .06  |
| Anxiety   | .47  | .20   | .91  | .73   | .63 | .85  | .36 | .47  |
| Love      | .58  | .94   | .94  | < .01 | .56 | .35  | .35 | 1.00 |
| Surprise  | .96  | 1.31  | .27  | -1.05 | .38 | .19  | .79 | .29  |
| Amusement | .74  | .58   | -.61 | -1.21 | .48 | .56  | .54 | .23  |
| Disgust   | .67  | .48   | 1.15 | .68   | .51 | .63  | .25 | .50  |

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Follow-Up Experiment B

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| Emotion      | Statistics   |                    |                      |                        | Significance ( <i>p</i> -values) |                  |                    |                      |
|--------------|--------------|--------------------|----------------------|------------------------|----------------------------------|------------------|--------------------|----------------------|
|              | Overall<br>F | Awe vs.<br>Pride t | Awe vs.<br>Neutral t | Pride vs.<br>Neutral t | Overall<br>F                     | Awe vs.<br>Pride | Awe vs.<br>Neutral | Pride vs.<br>Neutral |
| Anger        | .17          | .59                | .30                  | -.28                   | .84                              | .56              | .77                | .78                  |
| Fear         | 1.07         | -.20               | 1.15                 | 1.36                   | .35                              | .84              | .25                | .18                  |
| Sadness      | 1.65         | .80                | 1.81                 | 1.03                   | .20                              | .42              | .07                | .31                  |
| Awe          | 35.97        | -7.29              | -7.42                | -.20                   | < .01                            | < .01            | < .01              | .85                  |
| Peacefulness | 1.66         | 1.63               | 1.50                 | -.13                   | .19                              | .11              | .14                | .89                  |
| Excitement   | 1.44         | 1.19               | -.44                 | -1.64                  | .24                              | .24              | .66                | .10                  |
| Pride        | 21.17        | 4.76               | -1.43                | -6.20                  | < .01                            | < .01            | .16                | < .01                |
| Happiness    | 2.26         | 1.39               | -.69                 | -2.09                  | .11                              | .17              | .49                | .04                  |
| Boredom      | .94          | .04                | 1.20                 | 1.17                   | .39                              | .97              | .23                | .24                  |
| Anxiety      | 1.49         | 1.60               | 1.37                 | -.22                   | .23                              | .11              | .17                | .83                  |
| Love         | .88          | -1.18              | -1.12                | .05                    | .42                              | .24              | .26                | .96                  |
| Surprise     | .74          | 1.08               | .07                  | -1.01                  | .48                              | .28              | .95                | .31                  |
| Amusement    | 1.97         | .03                | -1.70                | -1.75                  | .14                              | .98              | .09                | .08                  |
| Disgust      | 1.67         | .40                | 1.74                 | 1.36                   | .19                              | .69              | .08                | .18                  |

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Follow-Up Experiment C

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| Emotion      | Statistics   |                    |                      |                        | Significance ( <i>p</i> -values) |                  |                    |                      |
|--------------|--------------|--------------------|----------------------|------------------------|----------------------------------|------------------|--------------------|----------------------|
|              | Overall<br>F | Awe vs.<br>Amuse t | Awe vs.<br>Neutral t | Amuse vs.<br>Neutral t | Overall<br>F                     | Awe vs.<br>Amuse | Awe vs.<br>Neutral | Amuse vs.<br>Neutral |
| Anger        | .16          | -.46               | -.53                 | -.07                   | .85                              | .65              | .60                | .95                  |
| Fear         | 1.46         | -.80               | .91                  | 1.71                   | .23                              | .43              | .37                | .09                  |
| Sadness      | .18          | .35                | .59                  | .24                    | .84                              | .73              | .56                | .81                  |
| Awe          | 24.34        | -6.53              | -5.41                | 1.15                   | < .01                            | < .01            | < .01              | .25                  |
| Peacefulness | .09          | .36                | .38                  | .02                    | .91                              | .72              | .71                | .98                  |
| Excitement   | 1.31         | -.90               | .71                  | 1.61                   | .27                              | .37              | .48                | .11                  |
| Pride        | .19          | -.48               | .08                  | .57                    | .83                              | .63              | .93                | .57                  |
| Happiness    | .02          | < .01              | -.18                 | -.18                   | .98                              | 1.00             | .85                | .85                  |
| Boredom      | .18          | -.56               | -.48                 | .08                    | .83                              | .57              | .63                | .93                  |
| Anxiety      | 1.03         | 1.42               | .89                  | -.53                   | .36                              | .16              | .37                | .59                  |
| Love         | .94          | -.59               | .78                  | 1.37                   | .39                              | .56              | .44                | .17                  |
| Surprise     | .10          | .16                | -.28                 | -.44                   | .91                              | .87              | .78                | .66                  |
| Amusement    | 8.79         | 2.78               | -1.31                | -4.11                  | < .01                            | .01              | .19                | < .01                |
| Disgust      | .24          | -.69               | -.26                 | .43                    | .79                              | .49              | .79                | .67                  |

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Experiment 5

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| Emotion | Statistics (Fs) | Significance ( <i>p</i> -values) |
|---------|-----------------|----------------------------------|
| Anger   | .11             | .74                              |
| Fear    | .03             | .86                              |
| Sadness | .50             | .48                              |

|              |       |       |
|--------------|-------|-------|
| Anxiety      | .01   | .94   |
| Love         | .27   | .60   |
| Happiness    | 23.24 | < .01 |
| Excitement   | < .01 | .98   |
| Peacefulness | .03   | .86   |
| Awe          | 32.12 | < .01 |
| Pride        | .33   | .56   |
| Boredom      | .23   | .63   |

*STIMULI EXPERIMENTS A AND 5*

| Happiness-eliciting slideshow |  | Awe-eliciting slideshow  |
|-------------------------------|--|--|
| 1.                            | Five kittens   | The Pinwheel Galaxy (Messier 101)  |
| 2.                            | Smiling baby lying on pillow   | Waterfalls at Plitviče Lakes National Park, Croatia  |
| 3.                            | Family of four tubing at a waterpark   | Mehrangarh Fort, India   |
| 4.                            | Mother lying beside daughter, both smiling and resting their heads against one another | Three climbers atop the Breithorn (Western Summit) Alpine peak                               |
| 5.                            | Apple pie with scoop of vanilla ice cream  | The Great Pyramid of Giza  |
| 6.                            | Man in park holding large bunch of colorful balloons                                   | Astronaut repairing International Space Station during spacewalk, planet Earth in background |
| 7.                            | Bride smiling while being zipped into her wedding gown                                 | Fly Geyser, Nevada   |
| 8.                            | Two bunnies sharing a leafy snack  | Three camels in front of the Taj Mahal, India  |
| 9.                            | Baby lying on blanket  | Goðafoss in the Bárðardalur district, Iceland  |
| 10.                           | Monarch butterfly on pink flower   | Hikers approaching snowy mountain range  |
| 11.                           | Three smiling children on carnival ride  | The Milky Way Galaxy   |
| 12.                           | Cheesecake with chocolate crust and topped with caramel sauce                          | The Red Fort, India  |
| 13.                           | Little girl showing rocks to Golden Retriever at the beach                             | Person atop giant desert sand dune   |
| 14.                           | Joyful children with arms raised in the air  | Colorado River flowing through the Grand Canyon  |
| 15.                           | Baby lying on father's chest   | View from inside ice cave, Iceland   |
| 16.                           | Elderly couple laughing while riding bikes together                                    | Sunrise over snowy mountain range  |
| 17.                           | Baby harp seal   | Eagle Nebula (Messier 16)  |
| 18.                           | Six smiling children linking arms and standing in a circle                             | Waterfall at Havasu Canyon, Arizona  |
| 19.                           | Smiling young couple sitting together, her arms wrapped around him                     | The Grand Canyon at sunset   |
| 20.                           | Courtyard garden with bench, wisteria, and other flowers in bloom.                     | Agra Fort, India   |
| 21.                           | Smiling baby crawling across hardwood floor  | Mount Everest  |
| 22.                           | Three scoops of ice cream on a cone, topped with chocolate sauce and sprinkles         | View of Earth from space   |
| 23.                           | Weimaraner dog with floppy ears  | Hiker standing inside ice cave, Iceland  |

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|---|--|
| 24. Three young girls, smiling with their arms around one another's shoulders           | Aurora Borealis in Svalbard, Norway                                  |
| 25. Two babies in a bath tub with rubber duckies  | Amer Fort, India   |
| 26. Elderly woman with glasses smiling  | Star-forming region (N90) in the Small Magellanic Cloud dwarf galaxy |
| 27. Adult elephant and baby elephant, holding trunks                                    | View from atop Dragon Falls, Venezuela                               |
| 28. A family—a mother and father, three children, and dog—sitting together on the grass | Badwater Basin in Death Valley, California                           |
| 29. Two smiling girls holding three kittens   | Hang Én, Vietnam   |
| 30. Young father holding up his baby  | Hiker atop summit of Mount Rainier, Washington                       |
| 31. Canada lynx kitten sitting on a tree branch   | Pillar of gas and dust in Carina Nebula (NGC 3372)                   |
| 32. Two smiling children and young man on a waterslide                                  | Belogradchik Fortress, Bulgaria                                      |
| 33. Smiling elderly couple, standing forehead to forehead                               | Camel atop white sand dune, Socotra Island, Yemen                    |
| 34. Colorful wildflowers  | Sunset at Point of the Arches, Olympic National Park, Washington     |
| 35. Baby playing in fallen autumn leaves  | Astronaut using a manned maneuvering unit, floating above Earth      |
| 36. Smiling young girl posing with one hand on her cheek                                | Hang Son Đòng, Vietnam   |
| 37. Three Border Collie puppies   | Aerial view of Owyhee River, Idaho                                   |
| 38. Two scoops of chocolate ice cream topped with chocolate shavings                    | Aurora Borealis over lake  |
| 39. Mother sitting with toddler in her lap  | Panoramic view of desert   |
| 40. White rabbit with long ears standing up in grass                                    | Fort Bourtange, Netherlands  |
| 41. Family picnic at a park   | The Matterhorn in the Alps, at the border of Italy and Switzerland   |
| 42. Two newborn tiger cubs lying with their mother                                      | Cave of the Crystals in Chihuahua, Mexico                            |
| 43. Baby grasping parents' fingers  | Andromeda Galaxy (Messier 31)  |
| 44. Two girls enjoying large slices of watermelon                                       | Seljalandsfoss in the South Region, Iceland                          |
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*STIMULI EXPERIMENT 3*

| Problem  | Experiential creation solution                                    | Non-experiential-creation solution   |
|--|---|--|
| 1. If my car or vehicle was in need of simple maintenance or upkeep (e.g., it needed to be cleaned, the wiper blades or light bulbs needed to be replaced, or fluids needed to be checked and replenished), I would... | Do it myself  | Have someone else (e.g., a mechanic, car detailer, or car washer) do it for me |
| 2. If something in my home was in need of repair or improvement (e.g., walls need to be painted, a shower was clogged, there was a hole in the drywall, or my faucet or toilet was leaky), I would...                  | Try to fix it myself  | Have someone else (e.g., a handyman) try to fix it for me                      |
| 3. If I was put in charge of organizing an event (e.g., a party, wedding, or fundraiser), I would...   | Create any needed flyers, invitations, announcements, etc. myself | Have someone else create any needed flyers, invitations, announcements, etc.   |
| 4. If an item of my clothing was ripped or damaged, I would...   | Try to repair it myself   | Have someone else (e.g., a tailor or seamstress) try to repair it for me       |
| 5. If I needed to host a dinner party, I would...  | Prepare and cook the food myself                                  | Have someone else (e.g., a caterer or chef) prepare and cook the food          |

STIMULI EXPERIMENT 4

*High Experiential Creation Framing*

Craving something sweet?



Create your own cake with Duncan Hines cake mix. Duncan Hines cakes are moister than those baked from any other leading brand. Irresistible on the eyes. Light and fluffy on the fork. So moist through and through, you'll want to dive right in. Like you want to do now.

*For when you want a treat that's made by you!*



*Low Experiential Creation Framing*



**Craving something sweet?**

Let Duncan Hines cake mix do the work for you.  
Duncan Hines cakes are moister than those  
baked from any other leading brand.  
Irresistable on the eyes. Light and fluffy on the fork.  
So moist through and through, you'll want  
to dive right in. Like you want to do now.

*For when you want a treat  
that practically makes itself!*

*Awe Condition*



# OUR HISTORY—AND POWDER—RUNS DEEP.

At Strykx Mountain, over 2,000 acres of terrain and 3,100 vertical feet of real snow, including the new Bergschrund Bowl, await—along with first-rate lodging, dining, shopping, and spas in our historic downtown and European-style village. High-speed lifts ensure you'll spend more time exploring our challenging steeps and over 60 named trails.  
You'll be deep in powder before you know it.

With world-class snowfall, uncrowded slopes, and runs ranging from every level—from the challenging Glissade Bowl to the spacious cruising terrain in Timberline Park—Strykx Mountain offers the perfect place for an unmatched ski adventure. Come for a night, stay for the weekend, or plan your entire winter vacation right here at Strykx Mountain. We've got what you want.





*Excitement Condition*

**OUR HISTORY—AND POWDER—RUNS DEEP.**

At Strykx Mountain, over 2,000 acres of terrain and 3,100 vertical feet of real snow, including the new Bergschrund Bowl, await—along with first-rate lodging, dining, shopping, and spas in our historic downtown and European-style village. High-speed lifts ensure you'll spend more time exploring our challenging steeps and over 60 named trails. You'll be deep in powder before you know it.

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*Neutral Condition*



**OUR HISTORY—AND POWDER—RUNS DEEP.**

At Strykx Mountain, over 2,000 acres of terrain and 3,100 vertical feet of real snow, including the new Bergschrund Bowl, await—along with first-rate lodging, dining, shopping, and spas in our historic downtown and European-style village. High-speed lifts ensure you'll spend more time exploring our challenging steeps and over 60 named trails.  
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