THE PACE OF AWESOME:
HOW FAST- AND SLOW MOTION MAKE THE ORDINARY AWE-INSPIRING

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ABSTRACT

This research shows that fast- and slow-motion videography techniques can make mundane video content more awe-inspiring because they reveal movements that are imperceptible in real time. A series of ten preregistered studies finds that fast and slow motion elicit awe by increasing awareness of time scales outside the human realm of experience (temporal vastness) and stimulating the incorporation of new knowledge (accommodation), in sequence. The results rule out the alternative explanation that any deviation from real time is awe-inspiring by showing that reverse-motion does not elicit awe. As a boundary condition, this research documents that fast- and slow-motion tactics do not inspire awe when they are applied to movements that are already fully perceptible in real time. Finally, as a downstream consequence, this research highlights that awe-inspiring fast- and slow-motion causes consumers to satiate to content more slowly. After eight repetitions, participants who had watched a video in fast- or slow-motion (vs. real time) liked the video more and were more likely to choose similar content in an incentive-compatible choice. Taken together, the benefits of fast- and slow-motion techniques for content creators are twofold: They make mundane content more awe-inspiring while simultaneously reducing consumer satiation and thus content fatigue.

Keywords: awe, time perception, satiation, content marketing

In today's digital landscape, consumers increasingly see the world through online videos. In 2024, videos made up for more than 82% of all consumer internet traffic (e.g., Knupp 2024). With over 500 hours of video being uploaded to YouTube every minute (Statista 2022), competition for consumers' attention is fierce. Whether on social media, blogs, or video platforms, content creators strive to release content with the "Wow factor", a slang term widely used among industry professionals to describe content that captivates and impresses audiences (Bamford 2006). This "Wow factor" is deemed essential for standing out in a crowded digital landscape and driving engagement

Interestingly, research has traced back the "Wow factor" to a distinctive emotional experience: that of awe. Awe is an emotion with profound effects that involves a sense of wonder and amazement that is triggered by extraordinary stimuli such as natural and man-made wonders that are so strikingly vast that they cannot be accounted for by people's current understanding of the world (Keltner 2023). Feeling awe prompts consumers to emotionally engage with the experience and spread word-of-mouth about it (Berger and Milkman 2012). It also promotes positive downstream consequences such as learning outcomes, an increased desire for experiential creation (e.g., Anderson et al. 2020; Rudd, Hildebrand and Vohs 2018).

The present work suggests that video creators can use two well-established videography techniques —fast motion and slow motion— to make mundane content more awe-inspiring. We argue that both fast- and slow motion enable consumers to perceive processes that are imperceptible in real time. Fast motion compresses time to make visible slow transformations that are not perceptible in real time (e.g., a plant growing). Slow motion, conversely, stretches time out to showcase movements that occur too quickly for the human eye to catch (e.g., the movement of a hummingbird's wings). Because fast motion and slow motion highlight movements that are usually imperceptible, this makes salient to consumers that so much happens outside their typical temporal frame of reference, which we call temporal vastness. To our knowledge, this research is the first to demonstrate that temporal vastness can make even ordinary content more awe-inspiring, in sharp contrast with prior work (e.g., Rudd et al., 2018; Piff et al. 2015).

To test our theory, we conducted ten preregistered experiments that reveal the mechanism, boundary conditions, and downstream consequences of the awe effects that we identify. We show that video clips of mundane content are more awe-inspiring in fast- and slow-motion than in real time. We also demonstrate that this occurs because fast- and slow-motion video speed makes consumers perceive time as vaster than they normally do. In turn, this realization makes consumers revisit and accommodate what they know about the world. Supporting this mechanism, we demonstrate that manipulations that theoretically do not induce temporal vastness, such as reversing the video motion and showing movements in fast-motion and slow-motion that are already perceptible in real time, do not elicit awe. Finally, as a downstream consequence of importance for content marketers, we highlight that fast- and slow motion lower the rate at which consumers satiate to videos. Watching the same content eight times in the real-time condition led to shape decreases in enjoyment. However, we found that this decline in enjoyment was less steep in the fast- and slow-motion conditions. This lower rate of satiation, in turn, led people in fast- and slow-motion condition to choose to watch similar video content in an incentive compatible choice task.

Across our ten studies, we document our effects by comparing (a) fast-motion videos to real-time videos and (b) slow-motion videos to real-time videos in turn, since our conceptualization proposes that different levels of information density drive our effects for each of these videography techniques. We apologize for not providing full details of our experiments below, due to the space constraints of this paper and share key findings. Testing H1, using the established measure of awe by Weidman and Tracy (2020), studies 1a-b show that videos elicit more awe in fast motion (study 1a, $N = 198$) and slow motion (study 1b, $N = 395$) as compared

to real time (fast-motion: M_{fast} = 3.34, SD = 1.36 vs. M_{real} = 2.34, SD = 1.03, F (1, 196) = 33.96, p < .001, η^2 = .15; slow-motion: M_{slow} = 3.20, SD = 1.33 vs. M_{real} = M = 2.36, SD = 1.07, F (1, 393) =48.27, p < .001, η^2 = .11). In studies 1a and 1b, we also rule out that our effects emerge because fast-motion and slow-motion videos are more immersive, interesting, novel, comprehensible, easier to process, and induce more positive affect than real-time videos.

Studies 2a and 2b replicate these main effects and demonstrate the psychological process via mediation (H2); in particular, we show that temporal vastness and accommodation statistically explain the effects of fast motion (study 2a) and slow motion (study 2b) on awe. We developed new items to measure our mediators to better suit the current research context. Measures of vastness in prior awe-research, such as the AWE-S scale (Yaden et al. 2019) primarily focused on physical size (e.g., "I perceived something that was much larger than me"). We therefore developed new items that assess the feeling that time is much larger than our typical perceptions of it (i.e., temporal vastness). We also created a new measure of accommodation, again to fit our more mundane consumption context.

The mediation evidence from studies 2a and 2b provides compelling evidence that fast- and slow-motion videos induce feelings of awe via the same psychological process. Serial mediation models using PROCESS model 6 (10,000 bootstrap sample) suggest that watching fast- and slow-motion (vs. real-time) videos induced the sense that time is vast. This experience of temporal vastness, in turn, triggered accommodation, which subsequently increased feelings of awe. This order of constructs is consistent with prior theory (Perlin and Li 2020; Shiota et al. 2007) and fits the data better than alternative model specifications (e.g., reversing the order of mediators).

In studies 3 and 4, we rule out alternative accounts for our effects. In study 3 (N = 593), we rule out that information about the outcome of a movement is solely driving the effect of fast motion on awe. We demonstrate that a series of static images showing movement progression (e.g., a glass of water freezing) is not as awe-inspiring as fast-motion footage, even though they both depict the movement outcome (i.e., a frozen glass of water). Using a 2X2 ANOVA, we examined the effects of speed (fast motion vs. real time), presentation mode (slideshow vs. video), and their interaction on feelings of awe. As before, we found a main effect of speed: People felt more awe in the fast-motion (M = 3.17, SD = 1.31) than in the real-time condition (M = 2.41, SD = 1.19; F(1, 589) = 56.68, p < .001, partial η2 = .09). There was also a main effect of presentation mode (F(1, 589) = 6.80, p = .009, partial η2 = .01). Critically, the interaction was significant (F(1, 589) = 8.89, p = .003, partial η2 = .02). As predicted, planned comparisons showed that participants felt significantly more awe when watching the fast-motion video (M = 3.45, SD = 1.34) than in any other condition (all M < 2.88; all p < .001, see figure 2). We repeated the above model, with fluency, immersion, positive activation, and the epistemic judgements (interest, confusion, novelty, and comprehensibility) as covariates. The interaction between speed and presentation mode was robust to the inclusion of these alternative accounts (F(1, 582) = 4.75, p = .030, partial η2 = .01). Planned contrasts also held with the fast-motion-video condition (M = 3.01, SE = 0.07) eliciting more awe than any other condition (all M < 2.80; all p < .032).

Study 4 (N = 597) rules out that simply experiencing time in an atypical way is sufficient to trigger awe by showing that reverse-motion footage has no effect on awe. Using a 2X2 ANOVA, we tested the effects of speed (slow motion vs. real time), motion direction (forward vs. reverse), and their interaction on feelings of awe. Conceptually replicating our previous findings, we found a main effect of speed indicating that people felt more awe in the slow-motion (M = 3.04, SD = 1.41) as compared to the real-time condition (M = 2.54, SD = 1.17; F(1, 593) = 21.85, p < .001, partial η^2 = .04). There was no main effect of direction (F(1, 593) = 0.002, p = .97, partial η^2 < .01) and no interaction, p > .270. Studies 5a (N = 592) and 5b (N = 593) document the boundary condition of information density (H3a and H3b). We find that

fast motion elicits awe when the movements' information density is low (study 5a), and that slow motion elicits awe when the movements' information density is high (study 5b). For movements of moderate information density, however, neither fast- nor slow motion elicit awe. We only provide the full details of Study 5a due to space constraints. In study 5a, we used a 2X2 ANOVA to examine the effects of speed (fast motion vs. real time), information density (low vs. moderate), and their interaction on awe. We found a main effect of speed ($F(1, 588) = 31.63$, $p < .001$, partial $\eta^2 = .05$), a main effect of information density ($F(1, 588) = 25.80$, $p < .001$, partial $\eta^2 = .04$). Most important, the interaction was significant ($F(1, 588) = 33.05$, $p < .001$, partial $\eta^2 = .05$; figure 3). Simple effects tests showed that, when information density was low, we replicated our original effect: The videos elicited more awe in fast-motion ($M = 3.20$, SD = 1.33) than in real-time ($M = 2.15$, SD = 0.95; $F(1, 588) = 63.57$, $p < .001$, partial $\eta^2 = .10$). As predicted, the effect of speed on awe disappeared for videos with moderate information density ($F(1, 588) < 0.1$, $p = .929$, partial $\eta^2 < .01$). We repeated the above model, but this time including fluency as a covariate. The interaction effect ($F(1, 587) = 32.46$, $p < .001$, partial $\eta^2 = .05$) and the simple effect of speed in the low density condition ($F(1, 587) = 62.65$, $p < .001$, partial $\eta^2 = .94$) emerged as robust.

Having firmly established the effect of fast-motion and slow-motion videography on awe, in studies 6a and 6b we demonstrated why these effects are relevant to practitioners. Drawing on the extant awe and satiation literatures (e.g., Redden 2008; Crolic and Janiszewski 2016; Chen and Redden 2023), we hypothesized that awe-inspiring stimuli, such as fast-motion and slow-motion videos, should lower the rate of satiation as compared to real-time videos because viewers sense that they are learning. Study 6a shows that this is the case for fast-motion (vs. real-time) videos and study 6b replicates this finding with slow-motion videos. In study 6a ($N = 790$), we found that the rate at which liking of a video decreased in response to repeated viewing was lower in the fast-motion than the real-time condition. In other words, as predicted, people in the satiation condition satiated more slowly. We tested this with a 2X8 mixed ANOVA with speed (fast motion vs. real time) as between-subjects factor and liking assessed as a within-subjects factor at eight equidistant timepoints across the watching experience (Galak and Redden 2018). As predicted, there was a significant condition by time interaction, $F(4.213, 3320.06) = 9.48$, $p < .001$, partial $\eta^2 = .01$, indicating that the rate at which liking changed (i.e., satiation) was significantly lower in the fast-motion (vs. regular speed) condition. To test the hypothesized process, we conducted a simple mediation model (PROCESS, Model 4), which was fully supported.

In study 6b ($N = 398$), we similarly found that the rate at which liking of the video decreased upon repeated watching was lower in the slow-motion versus the real-time condition. In other words, as predicted, people in the slow-motion condition satiated less. As in study 6a, we tested this using a 2X8 mixed ANOVA with speed (slow motion vs. real time) as a between-subjects factor and liking assessed eight times as a within-subjects factor. As expected, there was a significant condition by time interaction ($F(3{,}190, 1263{,}10) = 7.30$, $p < .001$, partial $\eta^2 = .02$), indicating that the rate at which liking decreased over time (i.e., satiation) was significantly lower in the slow-motion (vs. regular speed) condition. Next, we conducted the same simple mediation model as in study 6a (PROCESS, Model 4). When setting $\alpha = .10$, we find a significant indirect effect of speed on satiation via awe (B = -.52, SE = .38, CI (90%) = [-1.22, -.01][1]. The slow-motion video induced significantly more awe than the real-time video (b = .33, $t = -3.17$, $p = .002$) and awe was marginally negatively associated with satiation (b =

[1] When setting $\alpha = .05$, the indirect effect of speed on satiation via awe is not significant (B = -.52, SE = .36, CI (95%) = -1.35, .07,].

-1.58, t = -1.72, p = .087). The direct effect of speed on satiation was significant when accounting for awe (b = -6.13, se = 1.93, t = 3.19, p = .002).

This research makes four main theoretical contributions. First, it contributes to the literature on awe, which has overemphasized the role of physical vastness (Piff et al. 2015; Stellar et al. 2018), by highlighting how temporal vastness can make ordinary content awe-inspiring. Second, by establishing that awe lowers the rate at which consumers satiate to the watching experience, we uncover a novel downstream consequence of awe. This finding not only contributes to the literature on awe, but also to the satiation literature by identifying a new determinant of hedonic adaptation (Galak and Redden 2018). Third, by examining both fast motion and slow motion, our work contributes to the marketing literature on video speed which has, thus far, exclusively focused on slow motion (Jung and Dubois 2023; Stuppy, Landwehr, and McGraw 2024). By showing that these two different videography techniques elicit awe for the same reason, we provide a more comprehensive understanding of video speed effects. Finally, our work makes a substantive contribution by challenging the accepted wisdom that the awe-inspiring needs to be extraordinary. Our studies suggest that, by using fast- and slow motion as a temporal lens, awe can be found in relatively mundane objects and experiences. We thus reveal a new way for marketers to emotionally engage consumers online.

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