

Appetizing Imagery Puts Visual Perception on Fast Forward

October 05, 2017



People rated images containing positive content as fading more smoothly compared with neutral and negative images, even when they faded at the same rate, according to [findings](#) published in *Psychological Science*, a journal of the [Association for Psychological Science](#).

“Our research shows that emotionally-charged stimuli, specifically positive and negative images, may influence the speed, or the temporal resolution, of visual perception,” says psychological scientist Kevin H. Roberts of the University of British Columbia.

The idea that things in our environment, or even our own emotional states, can affect how we experience time is a common one. We say that time “drags” when we’re bored and it “flies” when we’re having fun. But how might this happen? Roberts and colleagues hypothesized that the emotional content of stimuli or experiences could impact the speed of our internal pacemaker.

Specifically, they hypothesized that our motivation to approach positive stimuli or experiences would make us less sensitive to temporal details. Change in these stimuli or experiences would, therefore, seem relatively smooth, similar to what happens when you press ‘fast forward’ on a video. Our desire to avoid negative stimuli or experiences, on the other hand, would enhance our sensitivity to temporal details and would make changes seem more discrete and choppy, similar to a slow-motion video.

To test this hypothesis, Roberts and colleagues used an approach common in psychophysics experiments

– estimating relative magnitudes – to gauge how people’s moment-to-moment experiences vary when they view different types of stimuli.

In one experiment, 23 participants looked at a total of 225 image pairs. In each pair, they first saw a standard stimulus that faded to black over 2 seconds and then saw a target stimulus that also faded to black over 2 seconds. The frame rate of the target stimulus varied, displaying at 16, 24, or 48 frames per second.

Participants were generally sensitive to the differences in frame rate, as the researchers expected. Participants rated the smoothness of the target image relative to the standard image using a 21-point scale: The higher the frame rate of the target image, the smoother they rated it relative to the standard image.

The emotional content of the images also made a difference in perceptions of smoothness. Regardless of the frame rate, participants rated negative images—which depicted things we generally want to avoid, including imagery related to confrontation and death—as the least smooth. They rated positive stimuli—depicting appetizing desserts—as the smoothest, overall.

Most importantly, the researchers found that people perceived images that faded at the same rate differently depending on their content. Positive target images that faded at 16 fps seemed smoother than neutral target images that faded at the same rate. Positive images that faded at 24 fps seemed smoother than both negative and neutral images with the same frame rate. And positive images that faded at 48 fps seemed smoother than negative images at the same rate.

Further analyses suggest that this effect occurred primarily because positive images elicited higher approach motivation.

Because the words “smooth” and “choppy” could themselves come with positive or negative connotations, the researchers replaced them with “continuous” and “discrete” in a second experiment. Once again, they found that the emotional content of the images swayed how participants perceived the frame rate of the fade.

Brain-activity data gathered in a third experiment indicated that the blurring of perceptual experience associated with positive images was accompanied by changes in high-level visual processing.

“Even when we made adjustments to the instructions and the task structure, the overall effect remained — people subjectively reported seeing less fine-grained temporal changes in positive images, and they reported seeing more fine-grained temporal changes in negative images,” says Roberts.

Together, these findings suggest that the emotional content of the images affected how participants experienced what they were seeing.

“What remains to be seen is whether emotional stimuli impact objective measures of temporal processing,” says Roberts. “In other words, do individuals actually perceive less temporal information when they view positive images, or do they just believe they perceive less?”

Co-authors on the research include Grace Truong, Alan Kingstone, and Rebecca M. Todd of the University of British Columbia.

This research was supported by a Natural Sciences and Engineering Research Council (NSERC) Discovery grant (RGPIN-2014-04202) to R. M. Todd and by a grant from the Leaders Opportunity Fund of the Canadian Foundation for Innovation (32102) to R. M. Todd.