The duration of pleasure in the experience of beauty — Lauren Vale & Denis Pelli

Psychology & Neural Science, NYU

The experience of beauty creates high, long-lingering pleasure, which is abolished by our beauty knockout conditions.

Introduction

Philosophers define beauty variously, but agree that it is a pleasure (e.g. Kant, 1764; Santayana, 1896). Here, we investigate the decay over time of the lingering pleasure from a beautiful object after its removal. We hypothesize that pleasure from beauty has a universal rate of decay, similar to, but much slower than, the decay of pain. Thus, we investigate the decay of pleasure over time.

Methods

A *trial* consists of presentation on the computer screen of an object (2 min) and collecting pleasure ratings for 4 minutes, during and after the presentation. Every 20 s, even after it is gone, we ask the observer how much pleasure (0 to 10) he or she feels right now from the object. For the objects used, the observer was tested with each object twice: once with a *beauty knockout condition* (designed to attenuate beauty), and once without, in random order. There are several knockout conditions. 1. The observer's name is called out repeatedly with varying intonation during presentation. 2. Immediately before the trial, we use a Mood Induction Procedure (Wright and Mischel, 1982) to induce sadness before exposure to the object. Before testing, each observer was asked to rate (1 to 4) how "movingly beautiful" is each object in our set of 30 paintings and photographs that we assembled to appeal to our observers, who are mostly NYU undergraduates.

$$p = \alpha\, e^{-t/\tau}$$

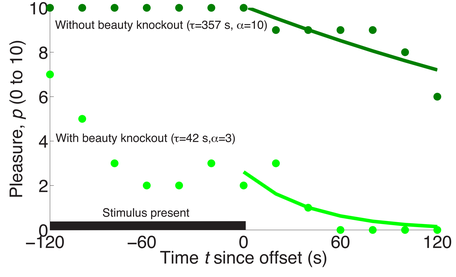

Fig. 1. Pleasure decays exponentially. We fit an exponential to the decay of pleasure after the stimulis is removed. p is self-rated pleasure (0 to 10). Each exponential has amplitude α and decays with time constant τ. Two fits are shown: without the beauty knockout (dark green) and with (light green). Thus we summarize each trial by two numbers (τ, α), the parameters of the exponential fit. The exponential fits are good. The average RMS error in pleasure was 0.7 without knockout and 1.0 with knockout. These two trials are the green arrow in Fig. 4.

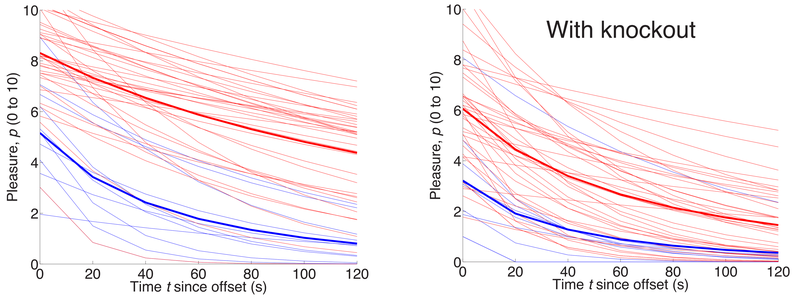

Fig. 2. Exponential fits. The thin lines show all our exponential fits, like those in Fig. 1. The left graph is for trials without the knockout, while the right graph is for trials with. Red indicates participants who said "yes," they enjoy art, and blue indicates "no." There are 36 red and 11 blue trials without knockout, and 39 red and 9 blue trials with knockout. The heavy lines use the average parameters computed in Fig. 3.

Results

Fig. 3 shows averages. In both groups, amplitude is significantly reduced, by about 2 points. For those who enjoy art, the knockout is very effective, reducing the decay time τ to less than half (red arrow). For those who do not enjoy art, the decay time is already short and is insignificantly reduced by the knockout (blue arrow). By these measures, the art-induced pleasure of those who do not enjoy art is like the knocked-out pleasure of those who enjoy art; neither decay time nor amplitude is significantly different. Figs. 4 and 5 show that the knockout conditions hugely affect long decay times but hardly affect short decay times.

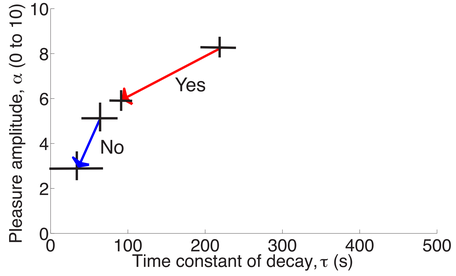

Fig. 3. Averages. Average pleasure parameters, with and without knockout, for those who do or do not enjoy art. Error bars are plus or minus one standard error. We use red for the 9 participants who said "yes," they enjoy art, and blue for the 3 who said "no." We plot one arrow for each group. The arrow tip is the mean (τ, α) with knockout; the base of the arrow is the mean without knockout.

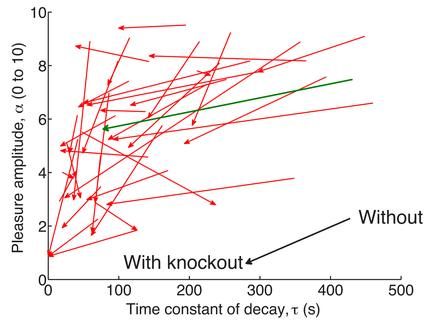

Fig. 4. Knocking out beauty. Here we plot each trial from Fig. 2 as an (x, y) point: the parameters (τ, α) of the exponential fit to the pleasure-decay curve. Corresponding trials (with and without the beauty knockout) produce a pair of points, which are connected by an arrow. The arrowhead tip represents the trial with knockout and the arrow base represents the trial without. The green arrow represents the two trials shown in Fig. 2.

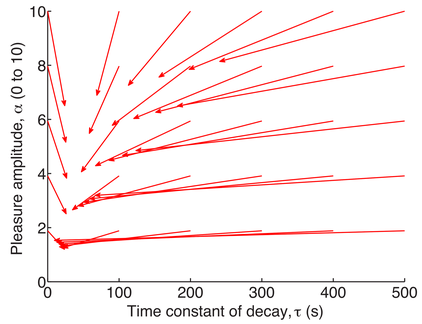

Fig. 5. Fitting the data. To interpolate the vectors in Fig. 2 at evenly spaced points in our parameter space, we fit a surface to both the horizontal ($\Delta\alpha$) and vertical ($\Delta\tau$) components of the vectors. This fit includes a regularization term to make the surface smooth. We sampled the space evenly, omitting arrows that extend beyond this range.

Conclusion

We find that high, long-lasting ($\tau \sim 200$ s) pleasure is a hallmark of a beauty response. Our beauty knockouts are effective and selective. They abolish high, long-lingering pleasure, and hardly affect lesser pleasures. The art-induced pleasure of those who do not enjoy art is like the knocked-out pleasure of those who enjoy art.

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