Lingering pleasure in the experience of beauty

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1. 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. Beauty is not universal—people differ—but we hypothesize that the lingering pleasure of beauty is universal. Thus, we investigate the decay of pleasure over time.

2. Measure pleasure

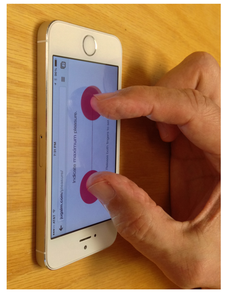
METHODS

BYOB: Bring your own beauty

We are not concerned here with what makes something beautiful. Rather, we are interested in the observers' experience when they say they felt beauty. Thus, observers pick a favorite image or song that is beautiful to them, and we use it in the experiment.

Did you feel beauty?

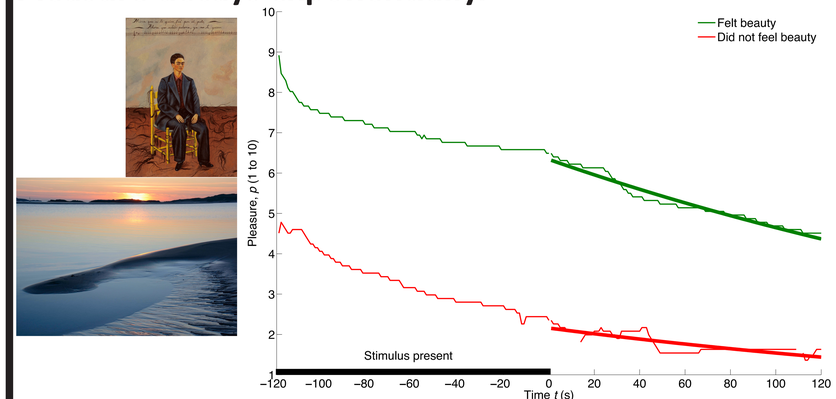
After each trial, we ask the observer, "Did you get the feeling of beauty from the object?" We use their answer to classify each trial as a beautiful or non-beautiful experience. This yes/no response is indicated by green for **yes** and red for **no**.



Decay of pleasure

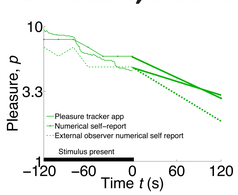
We record the observers self-reported pleasure over time during stimulus presentation and after. Observers are asked to indicate the pleasure they feel right now from the stimulus object. Observers continuously rate by spreading their index finger and thumb. That spread is recorded every second by a smartphone app (Emotion Tracker App, emotiontracker.net).

Pleasure decays exponentially.



We fit an exponential $p = \alpha \exp(-t/\tau)$ to the decay of pleasure after the stimulus is removed, where p is self-rated pleasure (1 to 10), t is time, and τ and α are fitted constants. Two trials are shown, one with the feeling of beauty (**green**) and and one without (**red**). We summarize each trial by two numbers, (α, τ), the parameters of the exponential fit. α is the pleasure at time zero, and τ is the decay time. The exponential fits are good (average RMS error 0.4). The trial with felt beauty had high, lingering pleasure, and the trial without felt beauty had low pleasure.

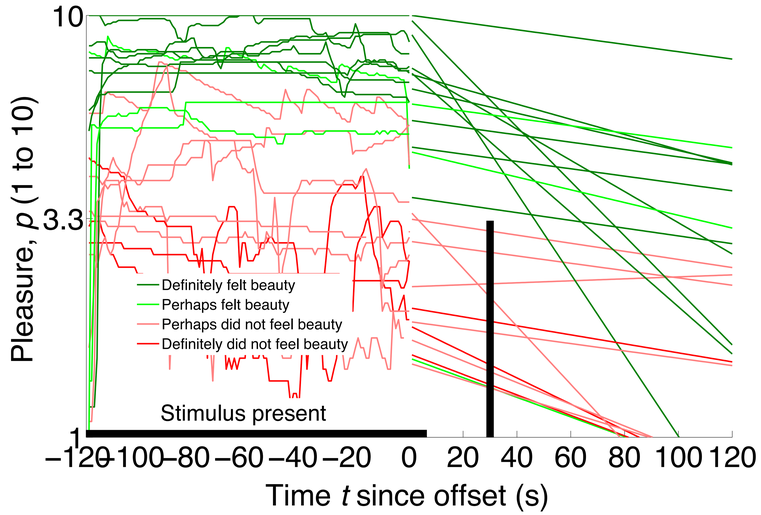
Pleasure, measured in 3 ways, is consistent.



Measuring pleasure in 3 ways for one observer and 6 images, we find 87% correlation between pleasure (1) and (2) and 79% correlation between pleasure (2) and (3). PLEASURE 1. Emotion Tracker App. PLEASURE 2. Numerical self-report. The observer makes a pleasure rating (0-10) every 20 seconds for the entire trial (stimulus exposure + offset). PLEASURE 3. External observer numerical self-report. We recorded a video of the observer's face, and had an external judge watch the video and numerically rate the observer's pleasure every 20 s.

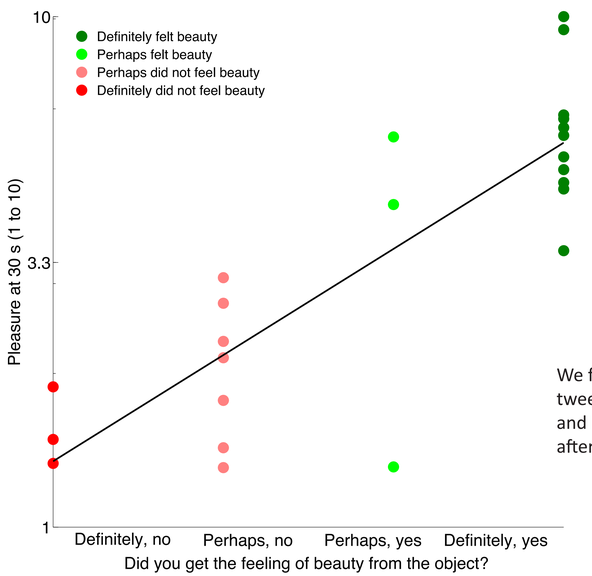
RESULTS

The feeling of beauty is associated with high, lingering pleasure.



24 trials are shown (six observers). Each stimulus was a song or an image. Each curve shows the raw pleasure ratings during stimulus exposure, and the exponential fits after stimulus offset. (Any exponential function is straight on a log scale.) The trials are color coded by the feeling of beauty (**yes** or **no**). p_{30} is the pleasure 30 s after offset. That time is marked by the vertical black bar. We find that on trials in which the observer felt beauty, the pleasure is high and lingering and still above 3.3 at 30 s. For trials in which the observer did not feel beauty, the pleasure is low, and below 3.3 at 30 s . Thus, the feeling of beauty is associated with high pleasure 30 s after offset (p_{30}).

Pleasure is 78% correlated with the feeling of beauty.



We find 78% correlation between the feeling of beauty and $\log(p_{30})$, i.e. pleasure 30 s after stimulus offset.

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3. Knock out the pleasure of beauty.

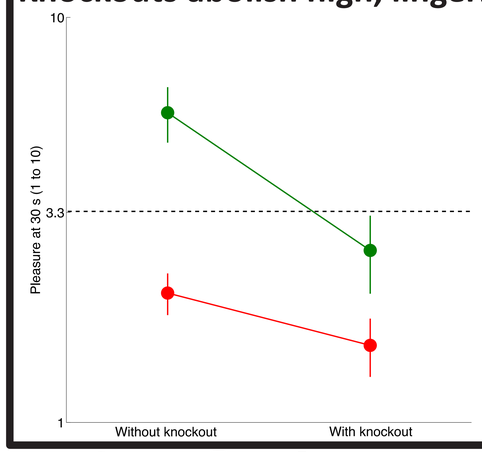
METHODS

Each observer was tested with each stimulus twice: once with a *beauty knockout condition* (designed to attenuate beauty), and once without, in random order. There are 2 knockout conditions. 1. NAME. The observer's name is called out repeatedly with varying intonation during stimulus presentation. 2. MOOD. Immediately before the trial, we use a Mood Induction Procedure (Wright and Mischel, 1982) to induce sadness before exposure to the object.

Each trial played one song: 2 songs selected by the observer, and 2 songs preselected by the experimenter. The observer listened to each song twice. Once with, and once without knockout, in random order. Each knockout was tested with a different song.

RESULTS

Knockouts abolish high, lingering pleasure.



The **green** color indicates a stimulus that is beautiful, i.e. the observer felt beauty from it without knockout. For beautiful stimuli, pleasure was halved by the knockout. For non-beautiful stimuli (**red**), the knockout had much less effect, reducing pleasure by 24%. The knocked-down pleasure of beauty was not significantly different from the pleasure of non-beautiful stimuli without knockout. Thus, our knockouts are effective—abolishing high lingering pleasure—and selective—only slightly affecting lesser pleasures.

4. Conclusions

To understand the experience of beauty, we are studying the pleasure that lingers after stimulus offset. We find that high, lingering pleasure (above 3.3 at 30 s after stimulus offset) is a hallmark of the beauty experience. We also found high correlation among three ways of measuring pleasure. A stimulus is "beautiful" for an observer who feels beauty from it. Our beauty knockouts are effective and selective. They abolish the high, lasting pleasure of beauty and spare the lesser pleasure of less-than-beautiful stimuli. The knocked-down pleasure of beauty is similar to the pleasure of less-than-beautiful stimuli.

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