

NYU The dimensionality of beauty

Qihan Wu¹, Aenne A. Briellmann¹, Mika S. Simoncelli³ & Denis G. Pelli^{1,2}
¹Psychology & ²Neural Science, New York University, New York, NY 10003
³Stuyvesant High School, New York, NY, 10282

Is beauty one-dimensional?

Are human mean relative-beauty judgments consistent with representation of each object's beauty by one number? That would mean that there is a linear beauty scale line, and each object gets one point on that line. If this is right, then participants' mean relative-beauty judgments will never be contradictory.

Stimuli

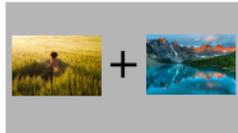


14 images from OASIS [1] database, for which we have normative valence and beauty ratings.



6 self-selected images (3 beautiful and 3 not beautiful).

Procedure



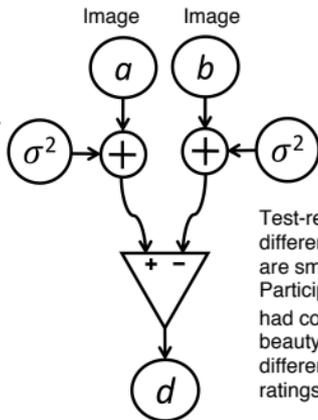
"Which is more beautiful, and by how much?"

All the possible pairs among 20 images were presented to each participant twice for test-retest. Each participant did 380 trials. For each trial, the participant chose which image was more beautiful and indicated by how much on a scale from 1 to 9.

Citation

Wu, Q., Briellmann, A. A., Simoncelli, M. S., & Pelli, D. G. The dimensionality of beauty. *18th Annual Meeting of the Vision Sciences Society*, St. Pete Beach, Florida, May 18-23, 2018. <http://psych.nyu.edu/pelli/posters.html>

Our 1-D model



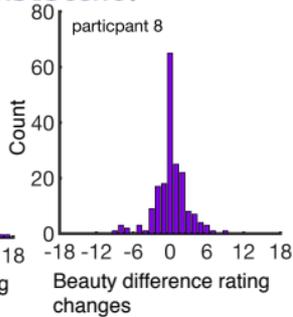
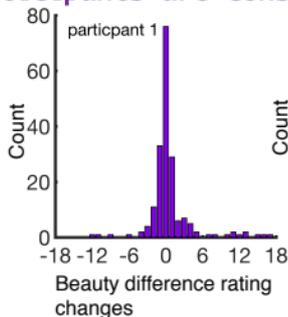
Test-retest differences are small. Participants had consistent beauty-difference ratings.

Difference rating

We hypothesize that the observer samples an estimate of beauty from a normal distribution.

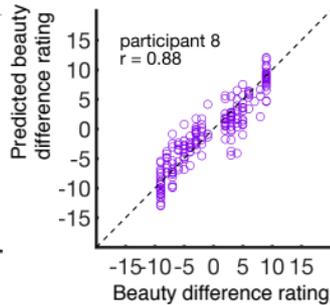
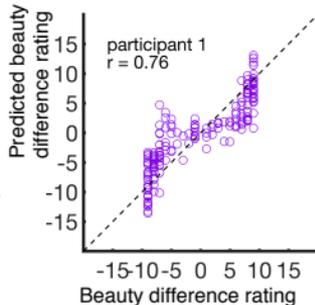
For one observer looking at 20 images, our model has 21 free parameters, one mean beauty rating per image and one common variance (σ^2). We found the values of the 21 parameters that maximize the likelihood of the beauty-difference ratings.

Participants are consistent.



Maximum likelihood estimation (MLE) fits well.

We took half of the data to fit the model, and predicted the rest. The average correlation was $r = 0.76$ (dashed line is the equality line).



Conclusion: A 1-D model fits beauty difference ratings well.

It's amazing that such a simple model fits so well. Beauty-difference ratings are well fit by a one-dimensional model.

Thus, human mean relative-beauty ratings are consistent. This is an important consideration for the potential of beauty judgments to underlie decision making.

Acknowledgements

We thank Larry Maloney, Katerina Malakhova, Hortense Gimonet, Najib Majaj and Mika Simoncelli for helpful comments.

References

[1] Kurdi, B., Lozano, S., & Banaji, M. R. (2016). Introducing the Open Affective Standardized Image Set (OASIS). *Behavior research methods*, 1-14.

Contact

Please contact gw686@nyu.edu for more information.