

# NYU The dimensionality of beauty

Qihan Wu<sup>1</sup>, Aenne A. Briellmann<sup>1</sup>, Mika S. Simoncelli<sup>3</sup> & Denis G. Pelli<sup>1,2</sup>  
<sup>1</sup>Psychology & <sup>2</sup>Neural Science, New York University, New York, NY 10003  
<sup>3</sup>Stuyvesant 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

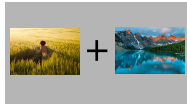


14 images from OASIS [1] database, for which we have normative valence and beauty ratings.



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

### Procedure



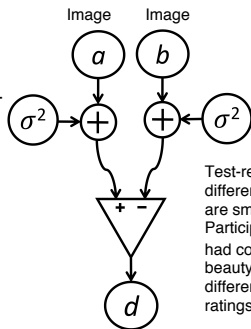
*"Which is more beautiful, and by how much?"*

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

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## Our 1-D model



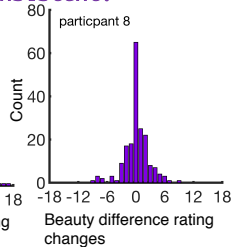
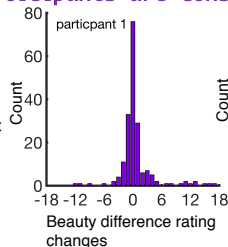
Test-retest differences are small. Participants had consistent beauty-difference ratings.

Difference rating

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

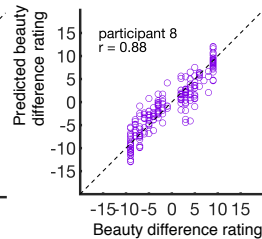
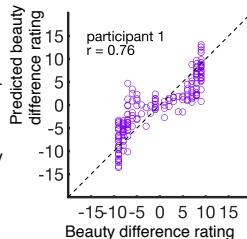
For one observer looking at 20 images, our model has 21 free parameters, one mean beauty rating per image and one common variance ( $\sigma^2$ ). We found the values of the 21 parameters that maximize the likelihood of the beauty-difference ratings.

### 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

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### 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](mailto:gw686@nyu.edu) for more information.