CCM Final Project Proposal

Group member: Avery Liang; Helen Hu; Rachel Chen
Topic: Applying the perceptual magnet model to color categorization: a study of Russian blue

Our final project seeks to delve into the Bayesian perspective on the perceptual magnet effect, specifically within the realm of color categorization. Perceptual magnetic effect refers to the way in which our perceptions of sensory stimuli are influenced by categorical knowledge, leading to a warping of perceptual space around prototypical examples of a category. To investigate this phenomenon in the context of color perception, we plan to conduct an experiment to collect behavioral data focusing on the discernment of various illuminations of blue.

In this experiment, participants will be exposed to a series of color blocks that encompass a gradient of shades of blue. This method is inspired by the approach taken by Winawer et al. (2007), who explored similar perceptual phenomena. The participants' task will be to evaluate each shade and determine whether it is more reminiscent of a light blue (illustrated by color 01 in Figure 1) or a dark blue (illustrated by color 20 in Figure 1). By requiring a binary choice between two broadly defined categories, we aim to capture the essence of the perceptual magnet effect in action.

The core hypothesis driving our investigation is that participants' judgments of these blue shades will not be uniformly distributed across the spectrum. Instead, we anticipate that their perceptions will be skewed or "warped" towards the prototypical examples of light and dark blue that we establish. This would serve as empirical evidence of the perceptual magnet effect in color categorization, suggesting that our brains are predisposed to organize sensory information into distinct categories, and that these categories influence how we interpret the nuances of our sensory experiences. Through this research, we hope to contribute valuable insights into the cognitive processes underlying color perception and categorization, furthering our understanding of the interplay between sensory stimuli and perceptual judgment.

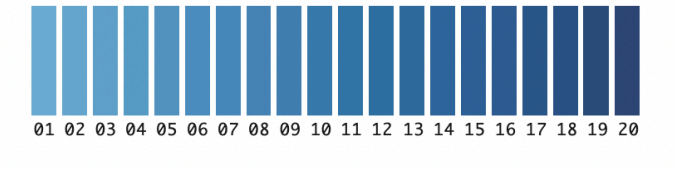

Figure 1. The 20 blue colors used in Winawer et al. (2007).

Final project is here: https://www.overleaf.com/9188953963jnsgdwtrhqgp#e0c93a

Reference

Feldman, N. H., & Griffiths, T. L. (2007). A rational account of the perceptual magnet effect. In Proceedings of the Annual Meeting of the Cognitive Science Society. (http://ling.umd.edu/~nhf/papers/PerceptualMagnet.pdf)

Winawer, J., Witthoft, N., Frank, M. C., Wu, L., Wade, A. R., & Boroditsky, L. (2007). Russian blues reveal effects of language on color discrimination. Proceedings of the national academy of sciences, 104(19), 7780-7785.