1098-92-53 **Rosemary K Le*** (rosemary.le@stanford.edu), 126 Blackwelder Court, Apt 515, Stanford, CA 94305, and **David A Mely** and **Thomas Serre**. *Computational Mechanisms Responsible for the Hermann Grid Illusion.*

The Hermann grid is a well-known illusion. In its classical form, one perceives gray spots at the intersections of a black-and-white grid. Textbooks typically attribute the phenomenon to retinal ganglion cells. But in recent years, variations of the illusion have demonstrated that ganglion cells cannot be the sole mechanism. While many qualitative theories have been proposed, no computational model has been shown to account for all variations.

Here we consider several computational models of early vision, including a model of ganglion cells and increasingly sophisticated models of visual cortex. We conducted an experiment where participants ranked illusion variations according to their relative strength. The average of the participants' rankings produced a ground truth against which model output rankings were compared. Spearman's correlation measured the consistency of the model's ranking to the ground truth. Model parameters were constrained by physiological data and optimized to best fit human data.

We find that the most complete model of V1 is the best predictor of human perception. Our results confirm that the origin of the Hermann grid illusion is cortical in nature and that the strength of its variations stem from the interaction of several cortical processes. (Received December 30, 2013)