Scaling Uncertainty in Visual Perception and Estimation Tasks

Eleanor Schille-Hudson
Indiana University, BLOOMINGTON, Indiana, United States

David Landy
Indiana University, Bloomington, Bloomington, Indiana, United States

Abstract

Demographic perceptionthe perception of social quantities of geopolitical scale and social significancehas been extensively studied in cognitive and political science (Citrin & Sides, 2008; Gilens, 2001; Herda, 2013). Regular patterns of over- and under-estimation emerge which have historically been attributed to social factors such as fear of specific minorities (Gallagher, 2003; Wong, 2007). Other work has suggested that these patterns result from the psychophysics of the perception of proportions (Landy, Guay & Marghetis, 2018). A Bayesian formulation suggests that biases in the estimation of both social proportions and simple visual properties result from a common source: hedging uncertain information toward a prior. Similar to work done by Zhang and Maloney (2012), we present a novel lab paradigm and two experiments that focus specifically on manipulating uncertainty in a simple (dot estimation) task, verifying the core assumptions of the Bayesian approach.