

Scaling Uncertainty in Visual Perception and Estimation Tasks

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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.