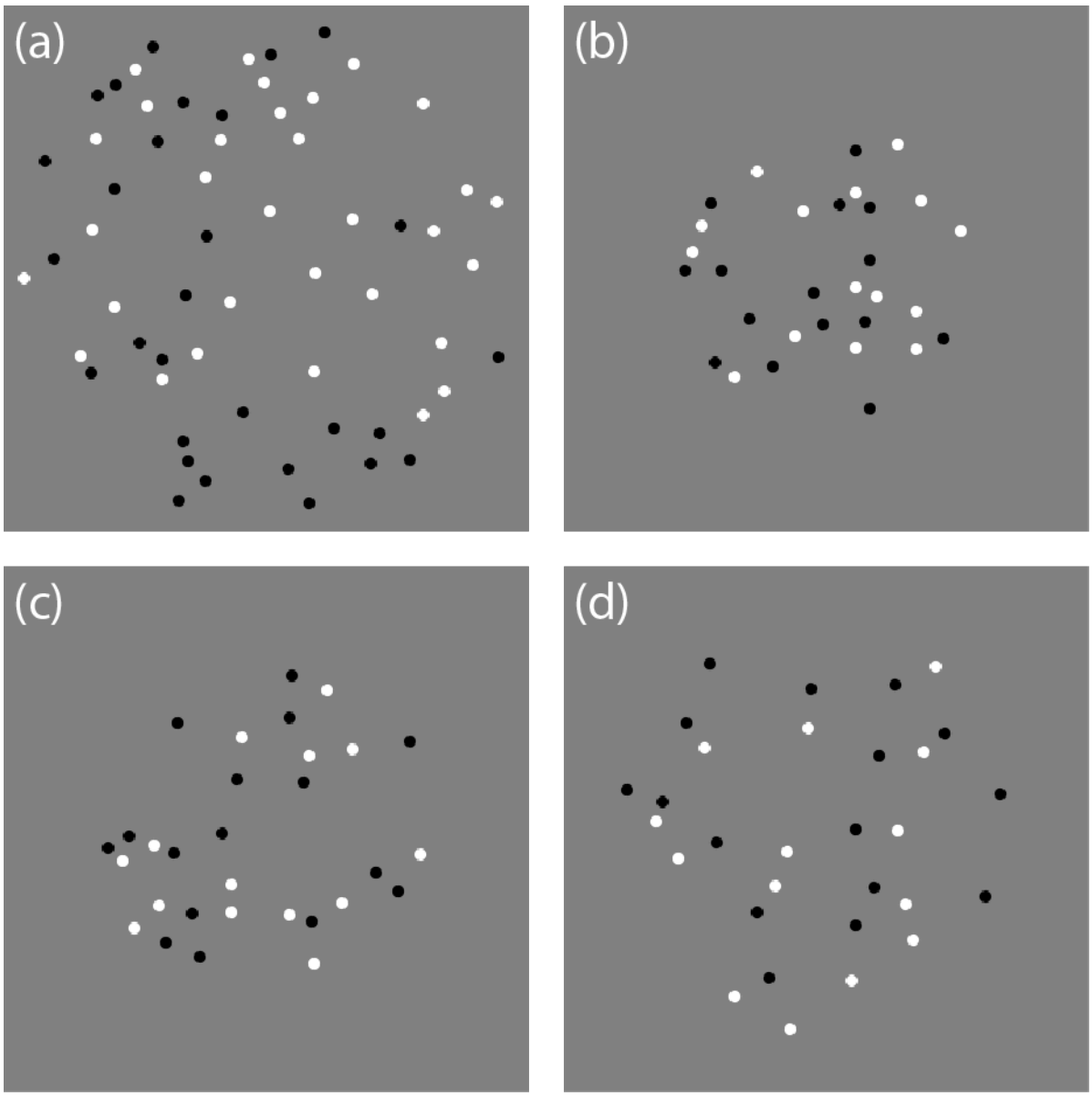
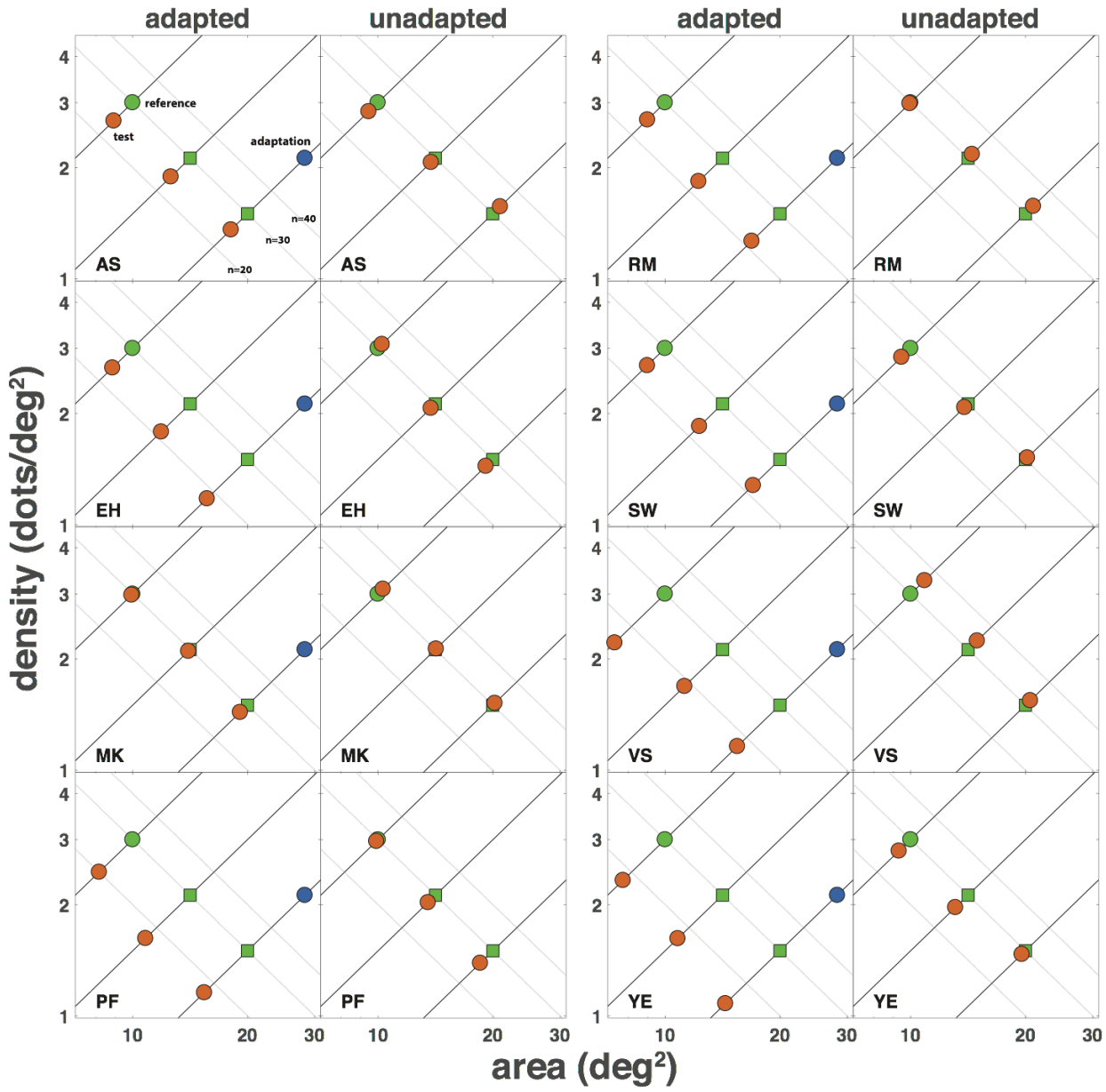
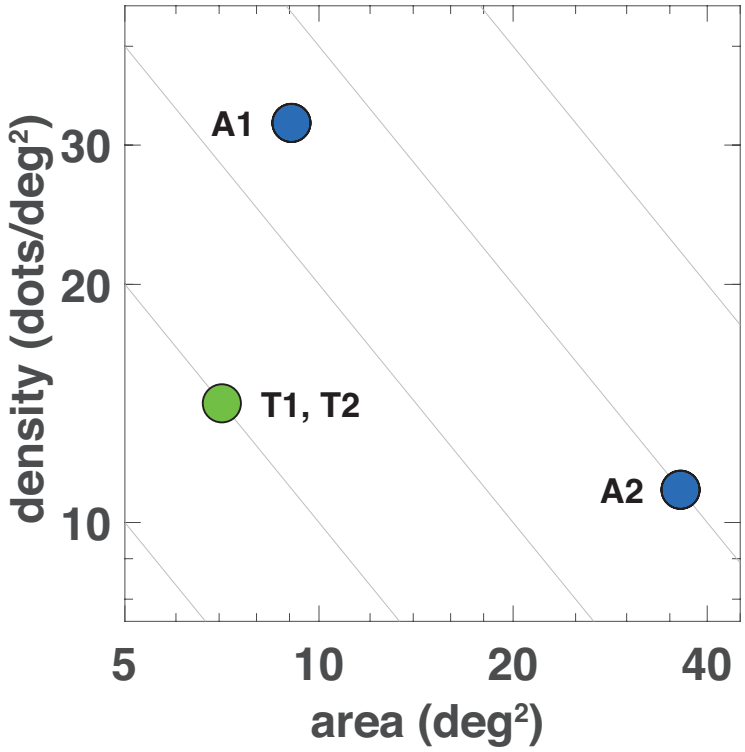


Supplemental Figure S1. Random dot stimuli. (a) The adaptation stimulus. (b) Reference stimulus 1 (the "critical" stimulus). (c) Reference stimulus 2. (d) Reference stimulus 3. The adaptation stimulus has 60 dots and the reference stimuli have 30 dots. Dot positions were resampled on every trial.



Supplemental Figure S2. Results for all eight observers. In each panel, the blue dot represents the adaptation stimulus. The green circle represents the critical reference stimulus (higher density and fewer elements than the adaptation stimulus), and green squares represent comparison reference stimuli. Diagonal grey lines are iso-numerosity lines, i.e., all stimuli on the same grey line contain the same number of elements. Diagonal black lines are orthogonal to the iso-number lines. Orange dots represent the unadapted test stimuli that observers judged to have the same number of elements as the adapted reference stimuli.



Supplemental Figure S3. Durgin's (2008) adaptation experiment, illustrated in the same stimulus space as our experiments (Figures 1b, 1c, and S1). Diagonal lines are iso-numerosity lines. At one location in the visual field, the random dot reference stimulus T1 is viewed after adaptation to stimulus A1. At another location, reference stimulus T2, an independently sampled random dot stimulus with the same area and density as T1, is viewed after adaptation to stimulus A2. Durgin found that T2 appears more numerous than T1, which is consistent with density adaptation: adaptation downwards by the high-density stimulus A1, and adaptation upwards by the low-density stimulus A2. However, it is unclear what the number theory's predictions are in this experiment. Both adaptation stimuli (A1, A2) have more dots than the reference stimuli (T1, T2), so both reference stimuli are predicted to have perceived number adapted downwards. After adaptation, is T1 or T2 predicted to appear more numerous? We cannot say without making additional assumptions about how the strength of number adaptation depends on the number of elements in the adaptation and reference stimuli. Thus this experimental design does not dissociate the predictions of density and number theories of adaptation as thoroughly as the experiment reported in the main text.