Supplementary material

Perceptual Organization Stimuli

Each perceptual organization stimulus was composed of 25 black and white dots (0.4 dva diameter each) organized on a 5 x 5 grid, either as rows or columns. Each stimulus was created by combining two reference stimuli: a fully organized stimulus and a disorganized stimulus with respect to the row/column organization of interest. The level of organization was defined by the probability of drawing each element from either the organized stimulus or from the disorganized stimulus (see Fig. S1a). For instance, a stimulus with a level of organization of 100% was identical to the fully organized reference. As the level of organization decreased, the probability of having stimulus with elements drawn from the disorganized stimulus increased, until the stimulus was actually identical to the disorganized reference stimulus (0%). In each trial, one stimulus was the *test* stimulus, with one of nine possible noise levels (0%, 12.5%, 25%, 37.5%, 50%, 62.5%, 75%, 87.5%, 100%), and the other stimulus was the *standard* stimulus (fixed, intermediate noise level, 50% organized as rows/columns). Both stimuli were organized into rows or columns, which was randomly determined on a trial-by-trial basis. Examples of stimuli at all nine organization levels used in Experiment 1 and Experiment 2 are showed in Fig. S1b. In Experiment 1, checkerboards were used as disorganized stimuli, which are by definition totally disorganized in terms of row/columns–the dimension of interest in our study. In Experiment 2, randomly organized stimuli were used as disorganized references, resulting in a more monotonic manipulation of perceptual organization. A new randomly organized reference stimulus was generated on each trial with the constraints that no more than two adjacent elements could have the same polarity and that two adjacent rows/columns could not be identical to each other.

Results: Effects of attention on Weibull parameters

Although the PSE estimates interpolated from each Weibull fit corresponded to the primary measure of perceived organization, we also evaluated the effects of cueing on the actual Weibull parameters for both Experiment 1 (Fig. S2a–b) and Experiment 2 (Fig. S2c).

- Experiment 1

Consistent with the change in PSE estimates as a function of cueing and ISI conditions, a two-way repeated-measures ANOVA on α (Weibull threshold) showed a significant main effect of cueing on threshold α ($F(2,22) = 10.38$, $p = .001$, $\eta_p^2 = .49$), as well as an interaction between cueing and ISI ($F(2,22) = 9.07$, $p = .001$, $\eta_p^2 = .45$). One-way ANOVAs showed a significant effect of cueing on threshold in the 100-ms ISI condition ($F(2,22) = 14.19$, $p < .001$, $\eta_p^2 = .56$), reflecting significant differences among the three cueing conditions (test-cued vs. neutral: $t(11) = 3.00$, $p = .012$; standard-cued vs. neutral: $t(11) = 2.64$, $p = .0231$; test-cued vs. standard-cued: $t(11) = 4.78$, $p < .001$). In contrast, for the 700-ms ISI condition, no significant effect of cueing was observed ($F(2,22) = 2.09$, $p = .147$, $\eta_p^2 = .16$). This pattern of results confirms our findings that the perceived organization functions shifted horizontally with attention (short ISI), but that no such change was observed when enough time was given to redistribute attention to both locations (long ISI).

In addition to the changes in threshold (α), an overall change in the slope (β) was also observed with cueing ($F(2,22) = 6.37$, $p = .007$, $\eta_p^2 = .34$), with no effect of ISI and no interaction between cueing and ISI (both *Fs* < 1). However, this overall changes in slope with cueing had a minor impact on our findings, as fixing the slope parameter β to 2.5 (equivalent to the slope parameter observed in the neutral condition) did not affect the effects of cueing and ISI on both PSE and threshold (α) parameters. When the slope was fixed, the interaction between cueing and ISI remained unchanged (PSE: $F(2,22) = 10.09$, $p = .001$, $\eta_p^2 = .48$; α: $F(2,22) = 7.32$, $p = .004$, $\eta_p^2 = .40$), reflecting a significant effect of cueing for the short ISI condition (PSE: $F(2,22) = 14.45$, $p < .001$, $\eta_p^2 = .57$; α: $F(2,22) = 13.29$, $p < .001$, $\eta_p^2 = .55$) but not for the long ISI condition (*Fs* < 1 for both PSE and α]. In addition to the fact that there were no clear changes in lower (γ) or upper (λ) asymptotes with cueing, both the changes in PSEs and in thresholds observed remained unchanged after fixing the upper and lower asymptotes to the parameters values observed in the neutral condition (Cueing-x-ISI Interaction, PSE: $F(2,22) = 9.44$, $p < .001$, $\eta_p^2 = .46$; α: $F(2,22) = 9.21$, $p =.001$, $\eta_p^2 = .46$), supporting the fact that the effects of attention reflected horizontal–rather than vertical–shifts of the Weibull functions.

- Experiment 2

A similar pattern of results was observed in Experiment 2. Consistent with the change in PSE estimates with cueing, we found a significant main effect of cueing on threshold α ($F(2,14) = 10.69$, $p = .002$, $\eta_p^2 = .60$), reflecting significant differences among the three cueing conditions (test-cued vs. neutral: $t(7) = 3.07$, $p = .018$; standard-cued vs. neutral: $t(7) = 2.44$, $p = .045$; test-cued vs. standard-cued: $t(7) = 3.74$, $p = .007$). Consistent with Experiment 1 (short ISI) results, there was no significant effect of cueing on the other Weibull parameters (slope: $F(2,14) = 0.66$; upper asymptote: $F(1.26,8.8) = 3.19$; $p = .104$, $\eta_p^2 = .31$; lower asymptote: $F(1.12,8.49) = 3.91$; $p = .077$, $\eta_p^2 = .36$). Again, the changes in PSEs and in thresholds due to attention were not affected when the upper and lower asymptotes were fixed to the parameters values found for the neutral condition (PSE: $F(1.16,8.18) = 9.14$, $p = .014$, $\eta_p^2 = .57$; α : $F(2,14) = 7.93$, $p = .005$, $\eta_p^2 = .53$), supporting the fact that the effects of attention reflected horizontal–rather than vertical–shifts of the Weibull functions.

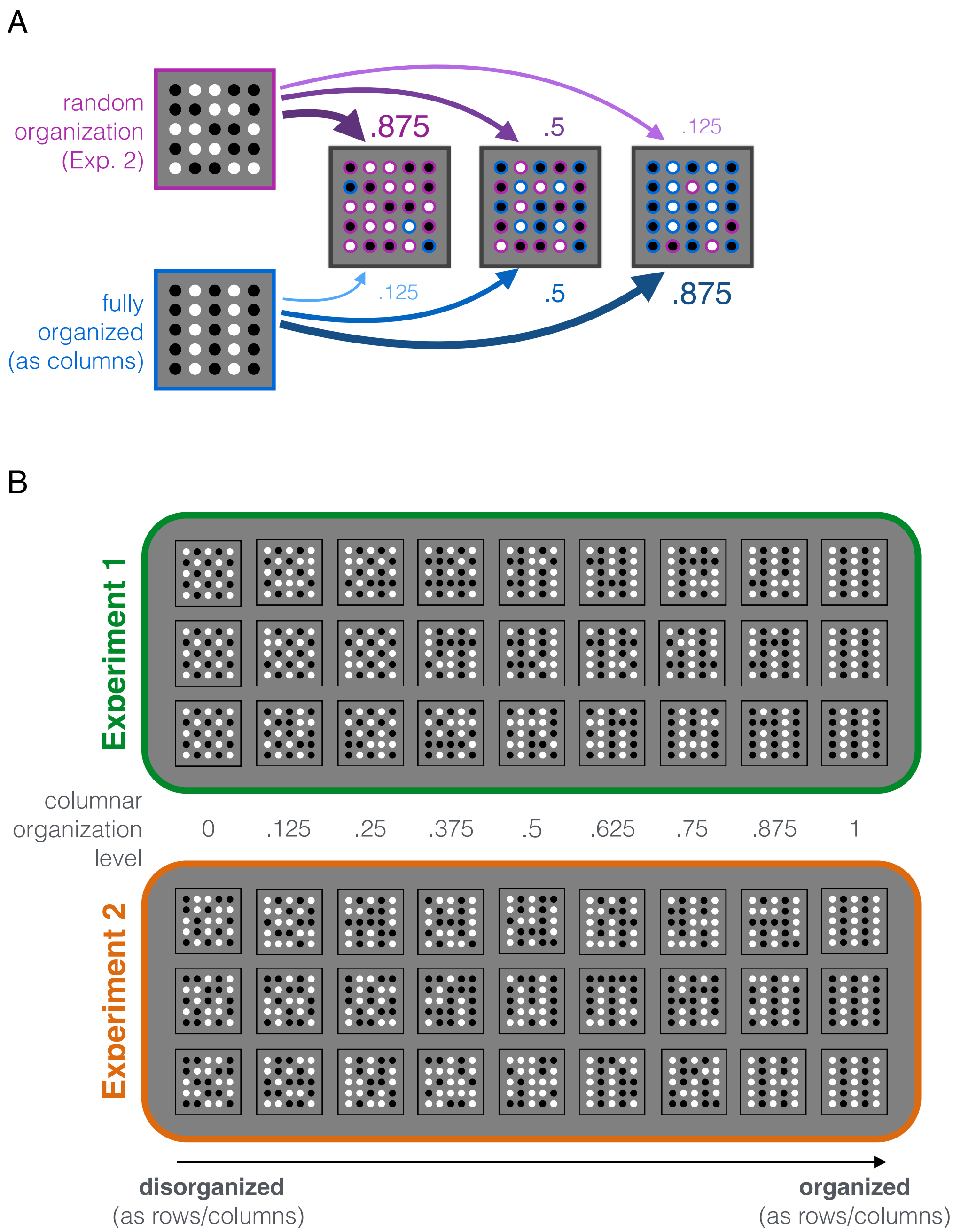

Fig. S1*.* **a** *Schematic representation of the perceptual organization manipulation*. Each stimulus was created by combining two reference stimuli: a disorganized stimulus (here, a randomly organized configuration used in Exp. 2) and a fully organized stimulus (here, with a columnar organization). The level of organization corresponded to the probability of drawing elements from either reference stimulus, with a higher organization level resulting in a stronger probability of having elements originating from the organized reference configuration. **b** Examples of stimuli at each different level of perceptual organization used in Experiment 1 (checkerboard stimuli used as the disorganized configuration in terms of row/column organization) and Experiment 2 (random stimuli used as the disorganized configuration in terms of row/column organization)

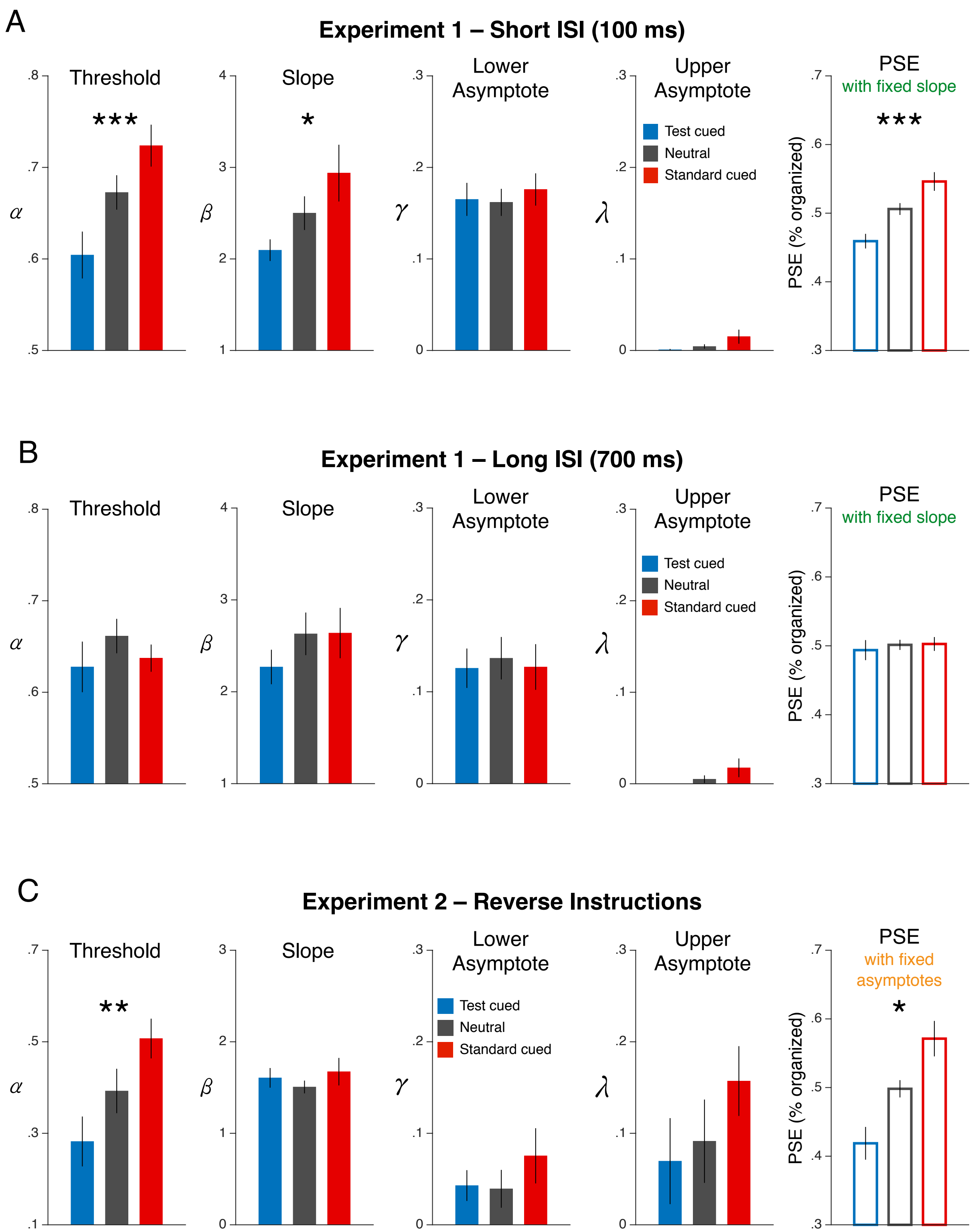

Fig. S2. Effects of cueing on the different Weibull parameters in Experiment 1 (**a**: attention, short 100-ms ISI; **b**: control, long 700-ms ISI) and Experiment 2 (**c**: attention, reverse instructions). Error bars represent ±1 SEM; * *p <.05*, ** *p <.01*, *** *p <.001*.