Components of visual prior entry
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Introduction
The theory of prior entry states that attention accelerates sensory processing, thereby reducing the time necessary for a stimulus to be perceived. Previous experiments have employed methodologies insufficient to distinguish prior entry from other mechanisms that could also cause the effects. The purpose of this series of experiments is to determine the contributions from the action of attention upon sensory mechanisms relative to those upon cognitive mechanisms such as criterion shifts and response biases, as well as non-attentional sensory facilitation produced by the attentional cues.

Method
In each experiment, two targets, one red and one green, were presented at a fixed eccentricity from a fixation point, with a variable stimulus onset asynchrony (SOA) between them. The task of the observer was to determine, in separate sessions, whether which target appeared first (temporal order judgment, TOJ), or whether the two targets appeared simultaneously or not (simultaneity judgment, SJ). Attention was directed to one of the two targets by a different type of attentional cue in each experiment.

Decision models
The behavioral responses were modeled based on variations of the models in Sternberg and Knoll (in Attention & Performance IV, 1973). The decision about the order or simultaneity may be derived, assuming that the perception of non-simultaneity is necessary for the observer to make a forced choice and respond with probability of the decision mechanism were evaluated through Bayesian parameter values, the evidence is insensitive to the choice of priors.

Discussion
In each experiment, two targets, one red and one green, were presented at a fixed eccentricity from a fixation point, with a variable stimulus onset asynchrony (SOA) between them. The task of the observer was to determine, in separate sessions, whether which target appeared first (temporal order judgment, TOJ), or whether the two targets appeared simultaneously or not (simultaneity judgment, SJ). Attention was directed to one of the two targets by a different type of attentional cue in each experiment.

Model comparison
The various models of the decision mechanisms were evaluated through Bayesian inference (MacKay, Neural Computation 4:435–447, 1992) by directly evaluating the evidence, $P(D|H) = \int P(D|w) P(w|H) dw$, where $D$ is the experimental data and $w$ is the vector of parameters for the model. The integration ranges over the entire parameter space for $w$, and the prior distributions of the parameters, $P(w|H)$, is assumed to be uniform within a specified range. Since the integral is typically dominated by a strong peak in the likelihood function, $P(D|w) = N(x, \alpha)$, near the optimal parameter values, the evidence is insensitive to the choice of priors.