

Pilot study

A pilot study ($n = 9$, student volunteers) was used to show that with the current stimulus parameters, subjects should perform poorly in detecting the blinking of the fixation cross unless they focused on it. Accordingly, detection performance should be good if subjects focused on the center of the screen but should be poor if subjects focused somewhere else.

To that end, subjects in the pilot task were asked to focus on a pink fixation cross that could appear somewhere in the picture at picture onset. While focusing on this pink cross, they should try to detect the blinking of the central cross. As soon as they detected blinking of the central cross, they were to push the space key on a keyboard.

The task comprised 200 trials. The task was identical to the actual task with several exceptions. First, a pink cross was superimposed somewhere on the picture immediately at picture onset, and subjects were instructed to focus on this pink cross rather than at the central cross (in the middle of the picture). The cross was bright pink (RGB levels = 255, 0, 255) and was shown in a gray box with a pink frame (0.5 x 0.5 cm). This stimulus was clearly visible (i.e., popped out) in the pictures. Second, the central cross blinked on 80% (rather than 20%) of the trials. Third, the pink cross was shown at one of four radial distances from the central fixation cross (0, 0.7, 1.5, and 2.9 cm; counterbalanced across picture categories) at one of eight clock positions (randomly determined on each trial).

Results were that when the pink cross was shown in the middle of the picture, subjects performed well in detecting the blinking of the central cross. Critically, performance dropped substantially with larger distance between the pink cross and the central cross: Mean hit rates for the four distances (i.e., 0, 0.7, 1.5, and 2.9 cm) were 91.4, 59.3, 43.0, and 26.6, respectively. Pairwise t tests between neighboring distances suggested that at the minimum (i.e., lower limits of the 95% CIs), mean performance decreased by 14, 6, and 3%, respectively.

These findings support the conclusion that unless subjects focused on the central fixation cross, they performed poorly on the main detection task.