Materials and methods.

Trial and participant inclusion. Outlier trials were defined as trials with a response time (RT) that is extremely short or long, based on the other responses given by this participants. That is, we first converted RT to inverse RT (1/RT). Then, we computed the Median and the Median Absolute Deviation (MAD) of this measure across all correct trials. If a trial had an RT that was more that 3.5 MAD away from the Median, it was counted as an outlier, and was removed from all further analyses. On average, 1.6% of trials per participant were labeled as outliers.

Outlier participants were defined by their overall RT on correct trials, averaged across conditions. If this average RT was more than 3SD slower than the mean across participants, a participant was labeled an outlier. This held for one participant, who was removed from further processing.

Note that in the analyses of reaction time, error trials were also not assessed. On average, participants were correct on 98.1% of trials.

Trial procedure. All stimuli were presented as black stimuli on a gray background (luminance value 128/256). Regardless of block type (see below), each trial began with the presentation of a small open fixation dot (8px radius with a 2px hole) in the center of the screen, for the duration of the intertrial interval (ITI). This interval was uniform randomly sampled between 500-800ms. The fixation dot remained visible throughout the entire block. After the ITI, a warning stimulus (S1) was presented by means of an open circle (radius 30px, width 12px). After its onset, the circle remained on screen for the duration of the foreperiod. The foreperiod was randomly chosen to be either 300,600, or 900ms. After this foreperiod, the open circle disappeared and a filled square (sides 60px) was presented, centered at 200px eccentricity to the left or right of fixation. This was the target stimulus (S2). Participants were instructed to respond to the location of S2 as quick as possible, using the ‘z’ key for left, and the ‘.’ key for right.

RT was defined as the time between the onset of S2 and the keypress. After providing this response, a feedback screen was presented for 350ms. The screen showed the text ‘CORRECT’ or ‘WRONG’ above fixation. In rewarded blocks, participants additionally saw below the fixation dot how many points they had obtained on this trial, based on their RT as follows: points = rounded((350-RT)/10), with a maximum of 20 points and a minimum of 0 points. In case of an incorrect response, ‘-15 pts’ was presented, indicating a 15-point penalty. In unrewarded blocks, there was no text below fixation, and no points (nor penalties) were counted.

After the feedback screen, the next trial began with a new, randomly sampled ITI.

Experimental design.
Blocks were designed conform a 2 x 2 design, crossing the factors ‘reward’ (rewarded/unrewarded) and target visibility (low/high) across different blocks. Target visibility was manipulated by having the target square presented either with gray values of 75 (high visibility) or 123 (low visibility). Each combination of conditions was presented four times, resulting in sixteen blocks. Within each block, each of the six combinations of foreperiods and target locations was presented five times, thus resulting in 30 trials per block. Each participant thus completed 480 trials in total.

Before the experiment began, participants were instructed about the task, and completed a practice block comprising 15 trials with random foreperiods and target locations. In this block, targets had high visibility and there was no reward. However, participants got feedback on the amount of points they would have scored in a rewarded block, to familiarize themselves with the scoring system.

At the start of each block, participants were informed whether they could obtain points in the upcoming block (reward), and whether the target would be easy or hard to see (target visibility). At the end of each block, they got feedback on their average RT and accuracy in the preceding block, the number of points amassed in this block, and the number of points amassed so far. They could then take a self-timed break before advancing to the next block.