Programming Final Project User Cases
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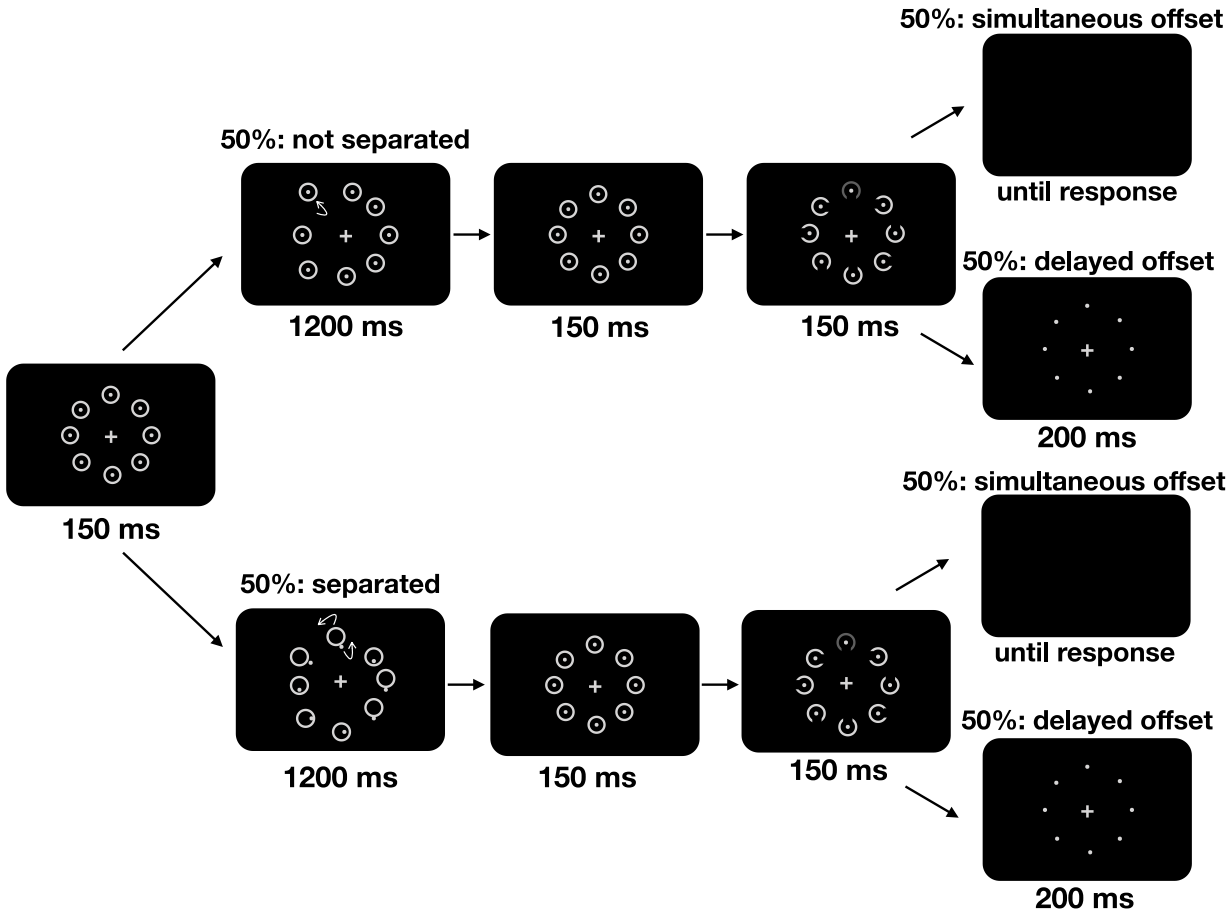
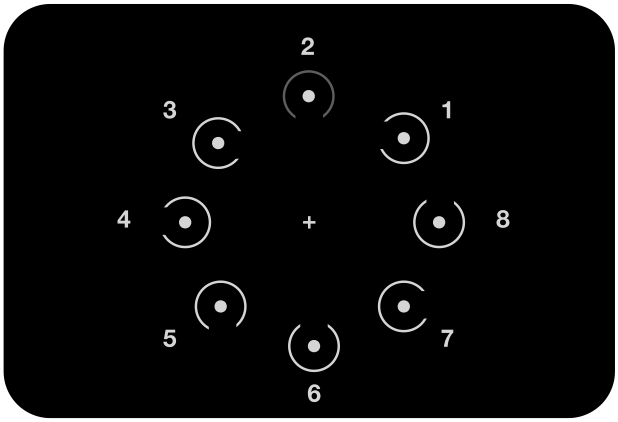



**User Case 1. Task description figure.** In a trial, participants see a frame of eight circles and eight dots for 150 milliseconds (ms). Then, in a not-separated condition, the circles and dots move together for 8 frames. Each frame lasts for 150 ms; in total, they last for 1200 ms. The not-separated condition occurs for 50% of the trials. The remaining 50% of the trials are in the separated condition, which the circles and dots move separately for 8 frames. The timing for the separated condition is identical as that for the not-separated condition. After the movement, participants see a frame of circles and dots return to their starting positions for 150 ms. Note that this frame is identical in both the not-separated and separated conditions. Then, in the next frame, gaps will appear on the circles for 150 ms. The target gap will appear on a circle that has a darker contrast, which appears to be dimmer than other circles. After that, in a simultaneous offset condition, circles and dots disappeared at the same time. The simultaneous condition occurs for 50% of the trials. The remaining 50% of the trials are delayed offset condition: after circles disappeared, dots will remain on display for additional 200 ms. Finally, participants' task is to report the target gap's side, being on either the left, right, top, or bottom of the circle. In this example, the target gap is on the bottom.




**User Case 2. Function:** RunTrial(offset, separation, target)

- Purpose: to run a trial with 3 input arguments that controls conditions in offset, separation, and target. First, offset refers to the offset between circles and dots. For simultaneous offset (e.g., offset = 0), after the last frame, circles and dots disappear together. For delayed offset (e.g., offset = 1), circles disappear, while dots remaining on display for 200 ms. Second, separation refers to the movement of circles and dots. For not separated (e.g., separation = 0), circles and dots appear to move together. For separated (e.g., separation = 1), circles and dots appear to move separately. Third, target refers to the target location, which is a gap on a circle with darker contrast and can be circle 1, 2, 3, …, or 8. Figure illustrates the target locations. In this example, target location is 2. The gap is on the bottom of the circle, which requires pressing the "down" arrow key.

- Sample input:
  - offset: 0 or 1
  - separation: 0 or 1
  - target: 1, 2, 3, 4, 5, 6, 7, or 8
- Note: this function has no return value. The output is the condition being shown.

- Example 1: simultaneous offset, not separated, target circle 1
  - RunTrial (0,0,1)
- Example 2: simultaneous offset, not separated, target circle 2
  - RunTrial (0,0,2)
- Example 3: simultaneous offset, separated, target circle 2
  - RunTrial (0,1,2)
- Example 4: delayed offset, separated, target circle 2
  - RunTrial (1,1,2)
- Example 5: delayed offset, not separated, target circle 2
  - RunTrial (1,0,2)