

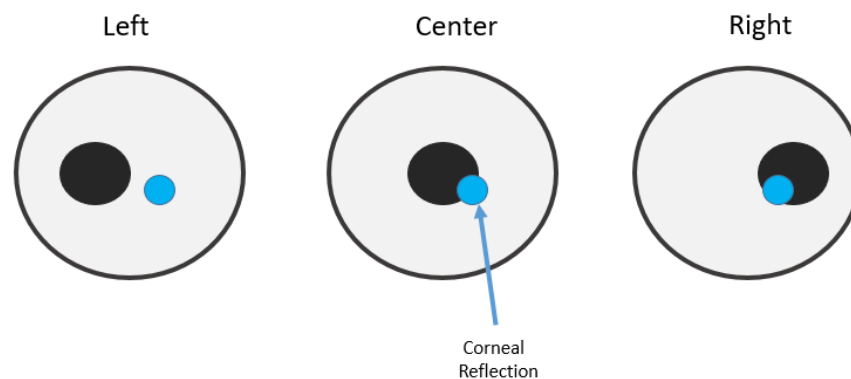
Eye Tracking for Psychology Research

Eye tracking allows us to measure participants' response to stimuli in real time. Using eye tracking, we can determine which of several stimuli initially captures a participant's attention, track changes in blink rate to assess dopamine activity in the brain, and reward participants for looking at specific objects.

The desktop-mounted eye tracking setup in our lab consists of an illuminator, a lens, two computers, and a headrest. The **illuminator** projects infrared light from a fixed position onto the participant's **cornea** to generate a **corneal reflection**. (You may notice small red lights when the illuminator is activated.) The **headrest** immobilizes the participant to ensure that the eye stays in front of the **lens**, which captures an image of the eye and sends it to the **host computer** (the experimenter's computer) while the **display computer** runs the study.

To **calibrate** the eye tracker, the participant looks at a series of white dots forming a 3 x 3 grid on the host computer. During calibration, the participant's eye position while viewing the top left, top center, top right, etc., is saved. During **validation**, the participant sees the same dots again to confirm that the eye position can be detected consistently (ideally within a degree of **visual angle**¹).

The eye tracker takes a series of snapshots of the participant's eye and tracks the relative positions of the pupil and corneal reflection. As the participant's eye moves, the corneal reflection is stationary (because the illuminator is fixed in place), but the pupil moves around the snapshot. The host computer then determines the participant's eye position based on the baseline values from calibration.



Other applications of eye tracking include examining reading speed in real time, investigating perception of artwork and film, assessing visuospatial deficits after head injury or stroke, determining which parts of a face draw the gaze of an autistic or typically developing child, and tracking consumers' behavior in marketing research.

¹ A measurement of distance on a screen as perceived by an observer. If the observer is farther from the screen, an object looks smaller. Degrees of visual angle take into account the observer's distance from the stimulus.