Words Field of View MRI Experiment

Welcome to Part 1 of the MRI study!

The purpose of these MRI scans is to map out the visual parts of your brain.

You will be in the scanner for roughly one hour. While you're in there, you will view stimuli through a mirror mounted right above your eyes.

The session will divided up into several "scans." Each scan lasts a ~5 minutes.

At the beginning of the session we will get you lying comfortably in the scanner and perform some preparatory scans to find your brain and set up the protocol. This takes about 10 minutes. During that time we will calibrate the eye-tracker and perform a practice task, then you can rest.

Then we will do several "functional scans" during which you must attend to visual stimuli and press buttons to report what you see. Each one of those scans lasts 5 minutes.

At the end, we will do a 5-minute anatomical scan get the structure of your brain with high resolution. During that scan you can just rest, and then we'll be done!

Three important notes:

(1) **Head motion:** During each scan, it is important that you **keep your head very still.** Head motion can ruin MRI data. We will put cushions around your head so that you are stable but comfortable. It is critical that you tell us at the beginning if you aren't totally comfortable and able to remain still for the next hour. Make sure your whole body is nice and comfy before we start. But if you ever get really uncomfortable and need to change something or stop, that is ok, just let us know.

(2) **Eye motion:** When we are presenting stimuli, it is important that you **keep your eyes fixed on the dot** at the center of the screen. You can blink, but don't look directly at any of the stimuli that appear off to the side. Our experiment depends on accurately measuring how your brain responds to things in your peripheral vision.

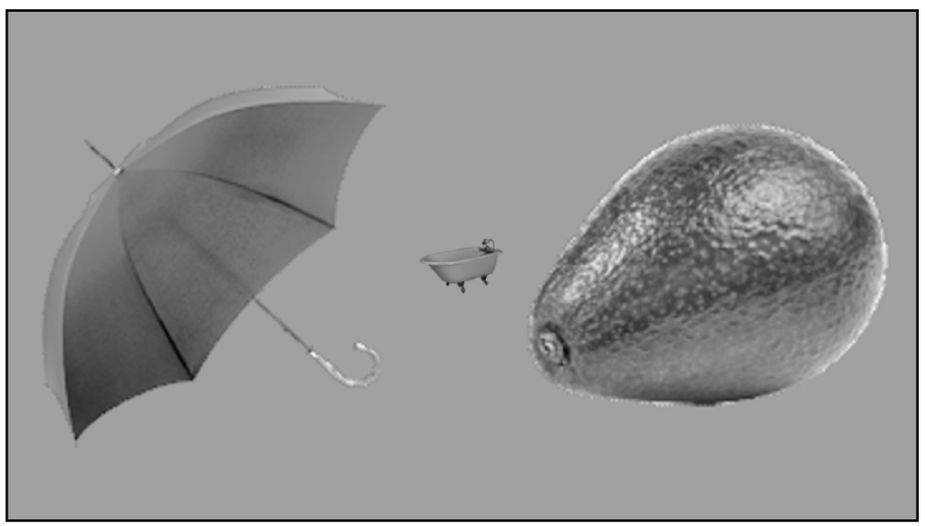
(3) **Communication:** While you are in the scanner, we will be in the control room. We can talk to you over an intercom, but only when the scanner is not running. If you need to get our attention at any time, you can press a **squeeze ball** that will alert us with a beep to stop the scan and check in on you.

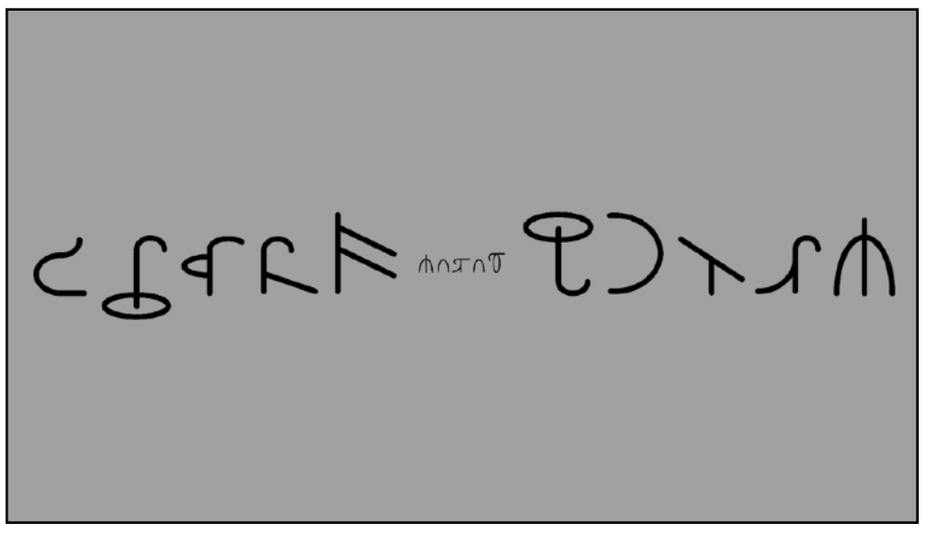
In order to keep your head still, we ask that you speak aloud as little as possible during the session. Before each scan, we will tell you what is going to happen and then ask you to press a button (or the squeeze ball) whenever you are ready to continue

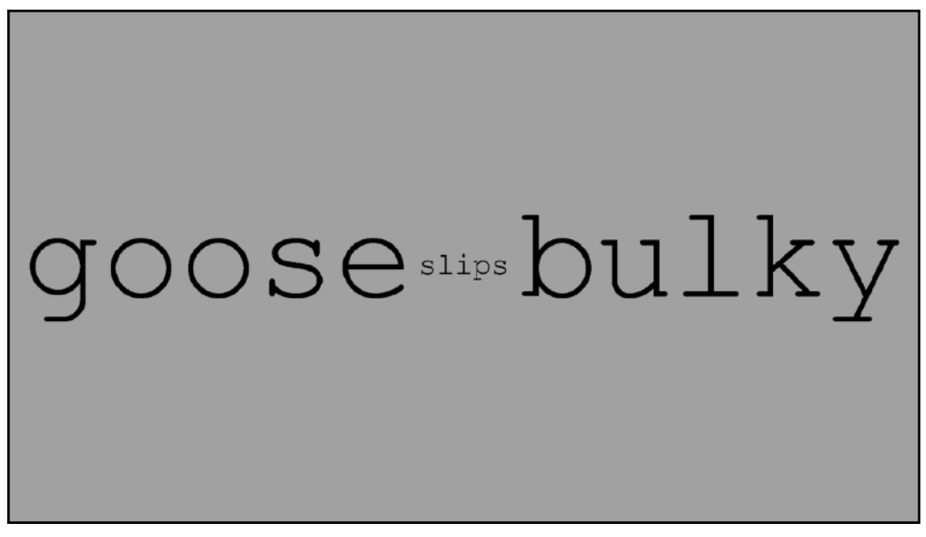
But again, if you need to talk to us for any reason, just squeeze the squeeze ball and then we will listen to you over the intercom.

Today we will do two types of functional scans: a **category localizer** with pictures of things, and a **retinotopy** experiment with moving bars.

During the category localizer, you will see a sequence of images like this:

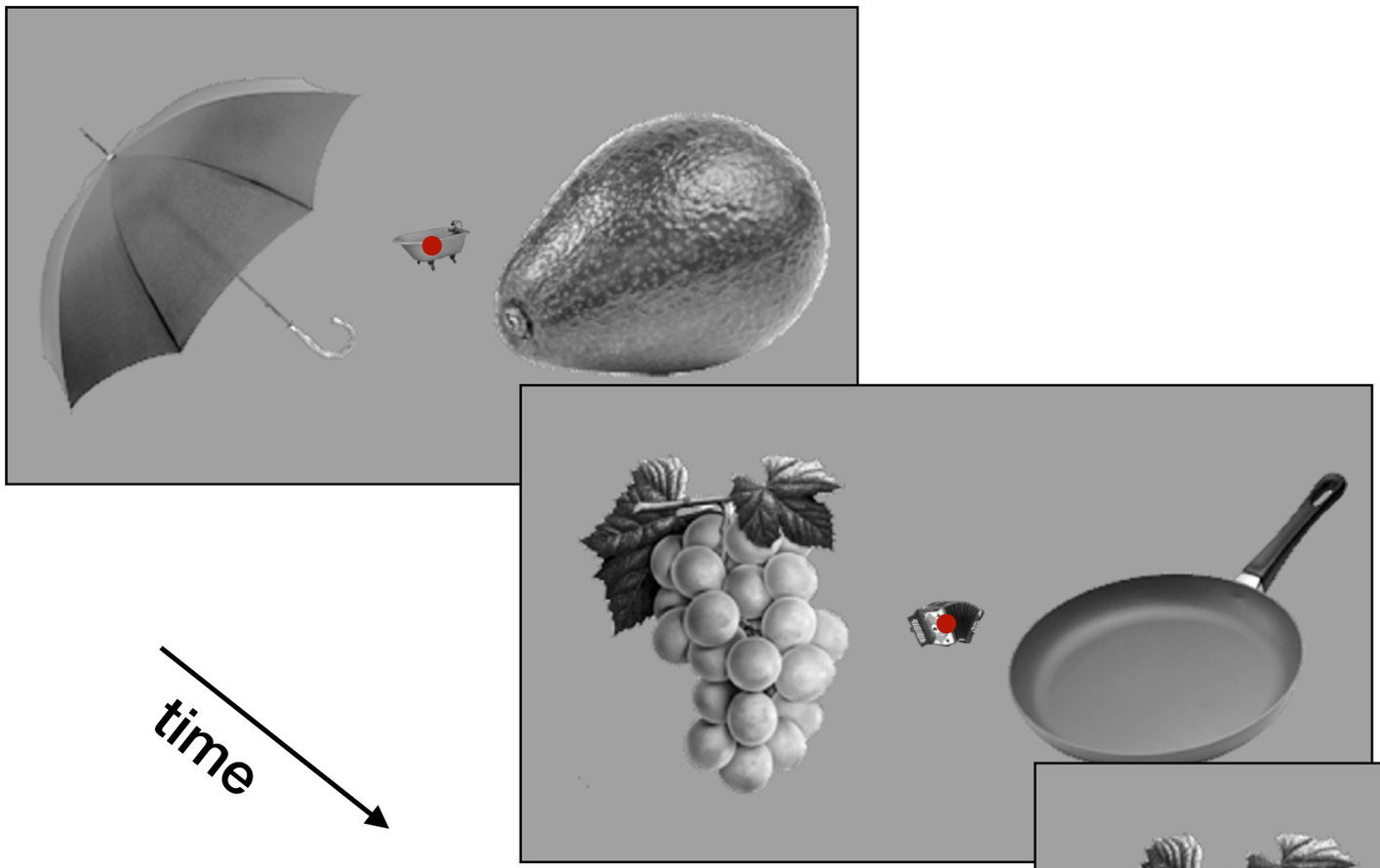






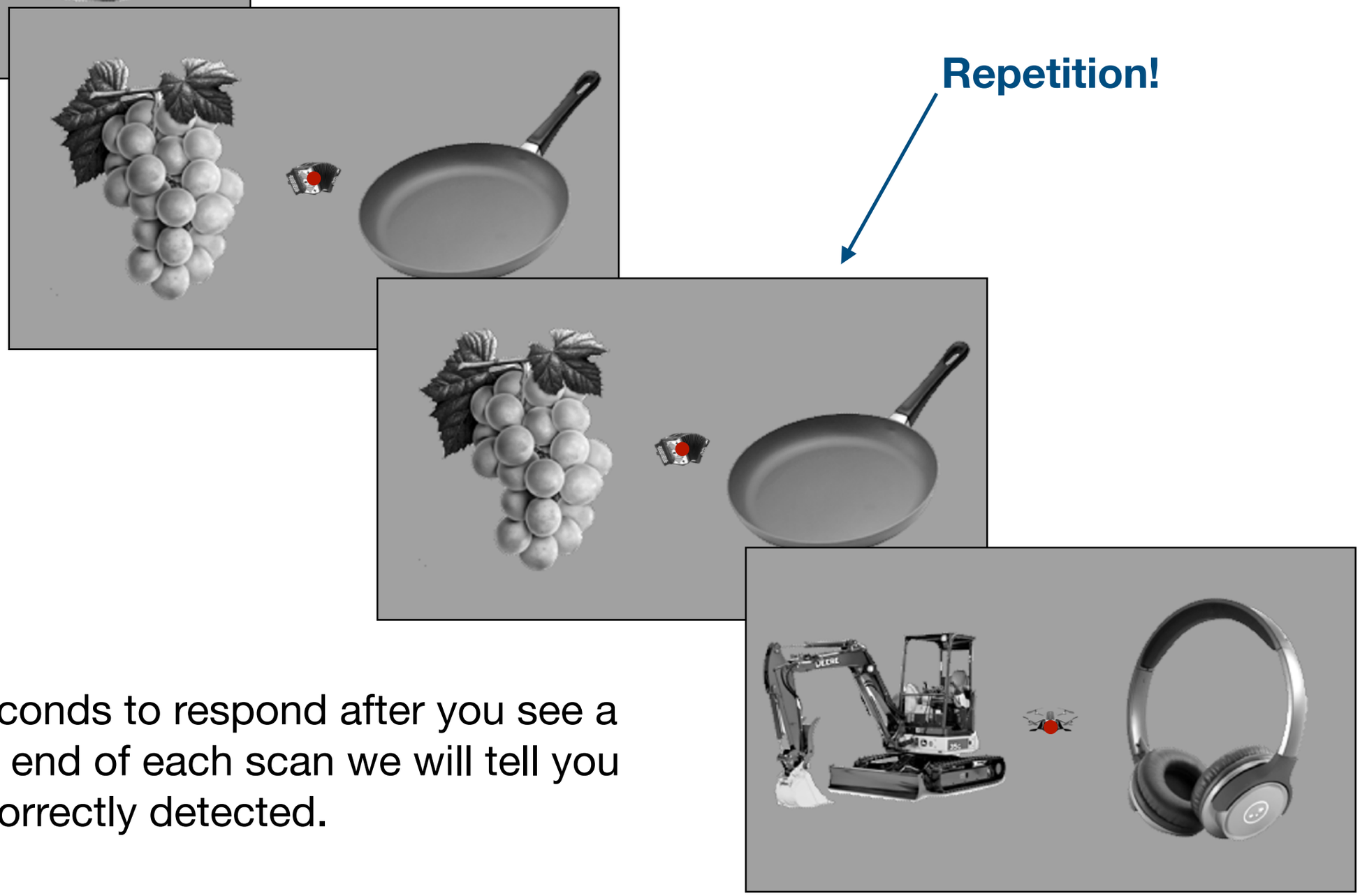
Most images contains 3 things, a small one at the middle and two big ones to either side. Some images contain just a single string of characters at the middle. The images flash quickly one after the other, with occasional blank periods. (There is also a long blank period at the start and end of each scan).

On half the scans, you will do a **one-back task**: press a button whenever you see the same image repeat. That is, when you see that *all three items* on the screen are identical to what was in the previous image.



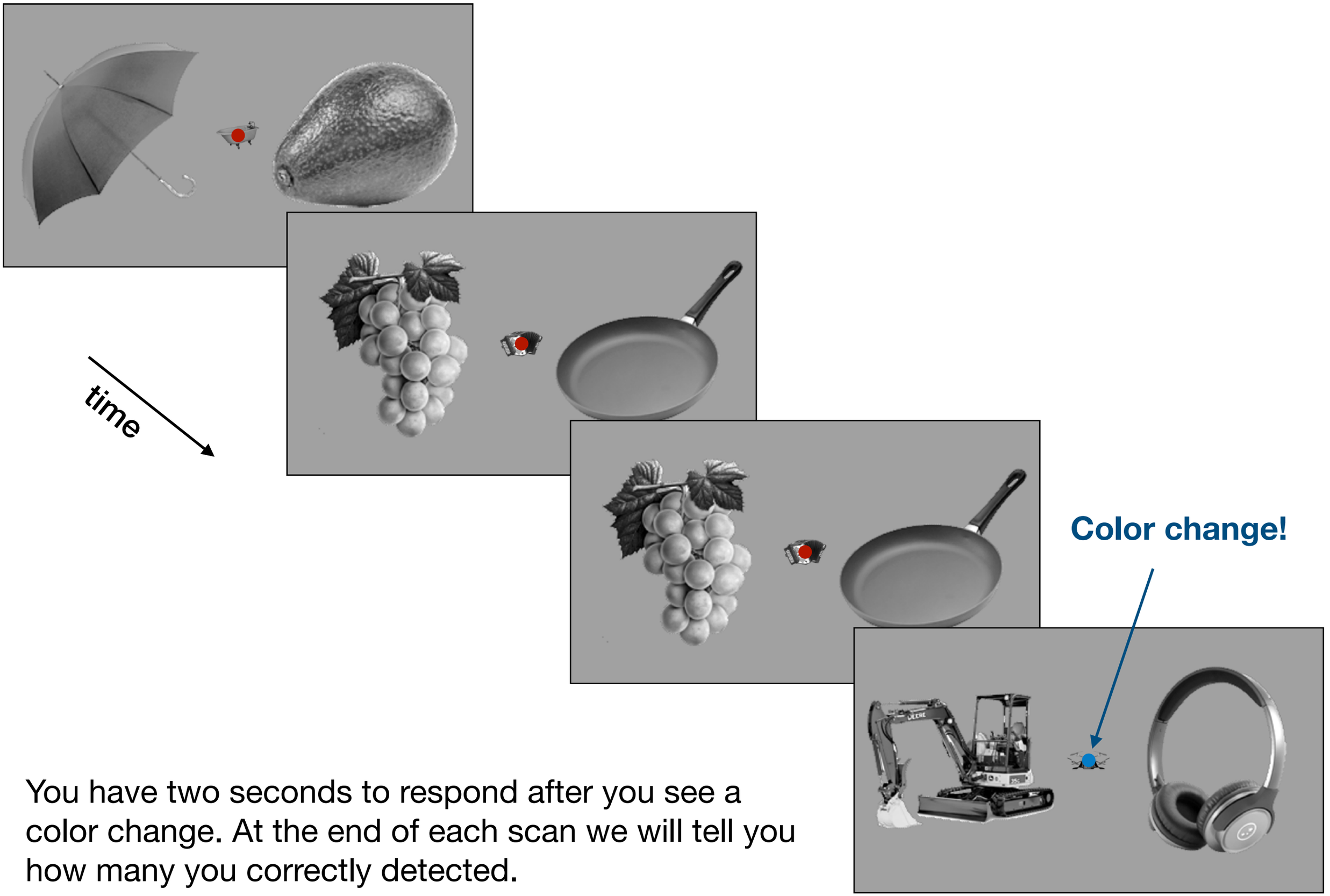
time

Repetition!



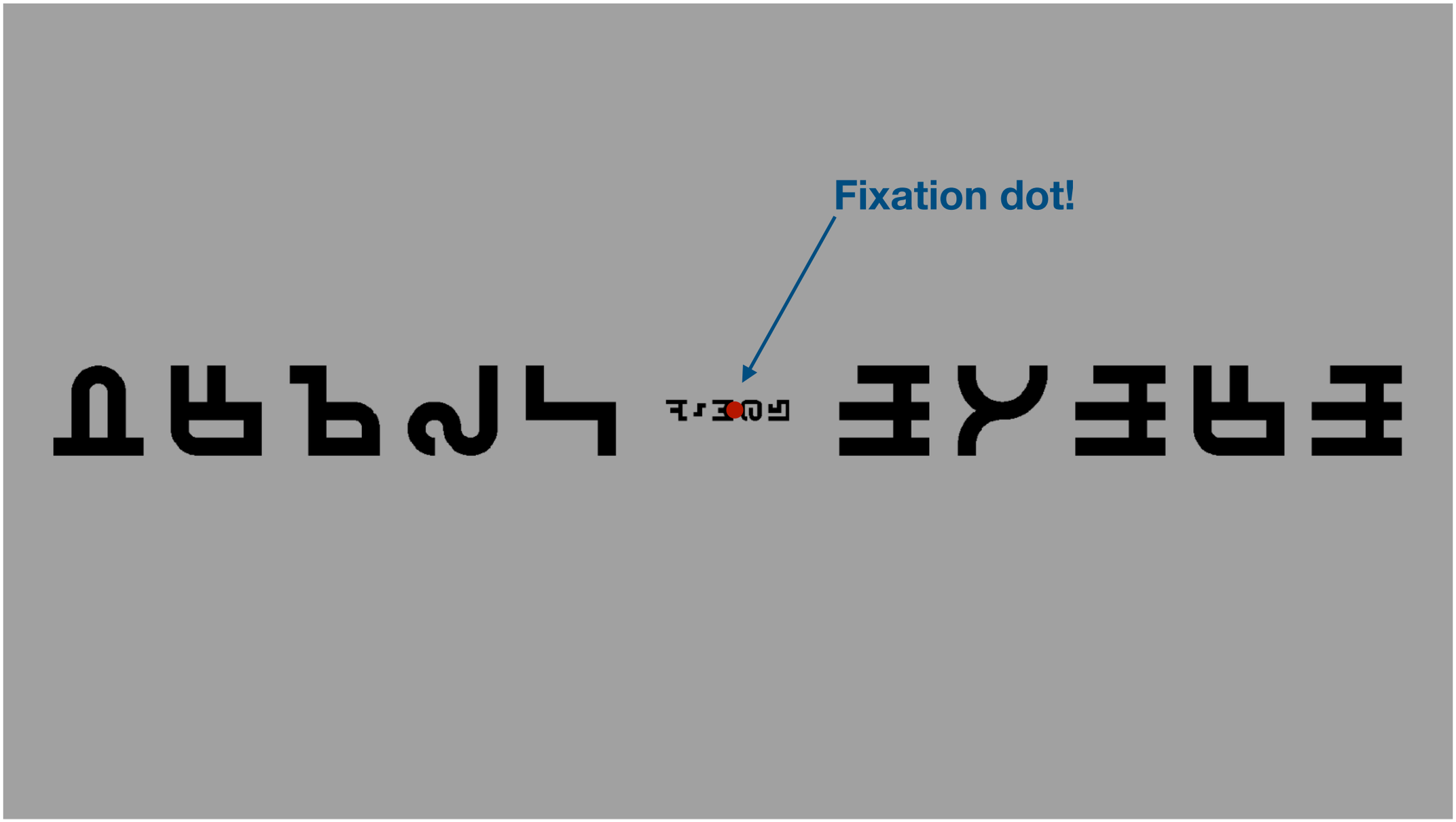
You have two seconds to respond after you see a repetition. At the end of each scan we will tell you how many you correctly detected.

On the other scans, your task is to press a button whenever the small dot at the screen center changes color. You do not have to attend to the other stimuli on the screen.



You have two seconds to respond after you see a color change. At the end of each scan we will tell you how many you correctly detected.

Throughout each scan you must keep your eyes fixed on that small dot at the center of the screen, *even when doing the one-back task.* Although it is tempting, please do not look directly at the items to either side.



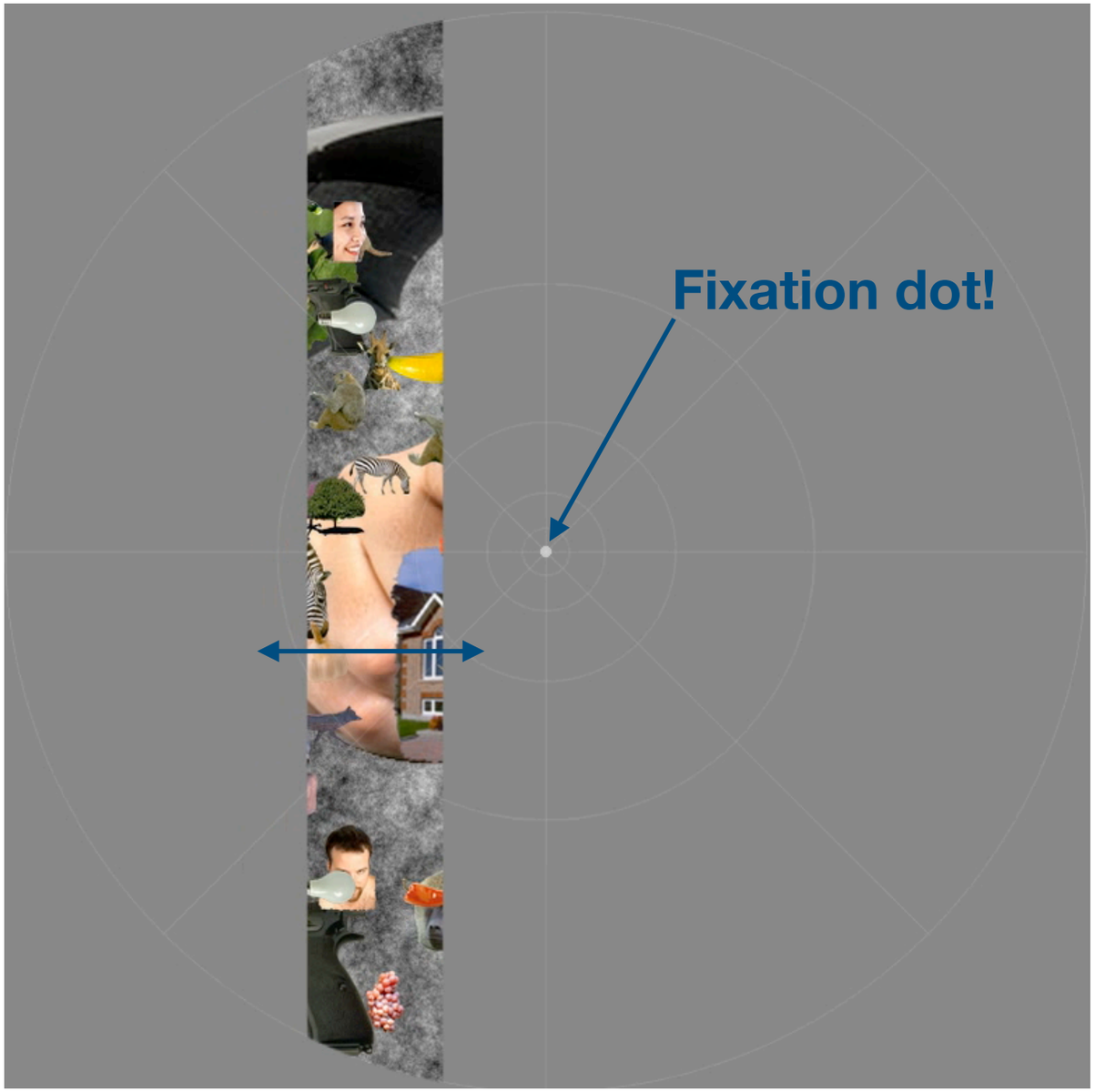
We will be monitoring your gaze position with a small camera mounted at the back of the scanner.

At the start of the first scan, we will *calibrate* the eye-tracker. To do this, you will carefully follow a black disk with your eyes as it jumps around to 5 positions on the screen.

Each time, wait for the disk to move before you move your eyes. This procedure is then repeated to *validate* the calibration.

Sometimes the eye-tracker requires adjustment and a few attempts, so please be patient.

During the **retinotopy** scans, a flashing bar will move slowly across the screen in different directions. The bar contains lots of interesting stuff but please don't look directly at it. As before, keep your gaze locked on a dot at the center of the screen.



Your task is simple: press a button whenever the fixation dot changes color. That happens pretty often, so stay alert!

To summarize:

In **category localizer scans,** fixate your gaze on the dot and press a button whenever you see the whole image repeat.

In **retinotopy scans**, fixate your gaze on the dot and press a button whenever it changes color, resisting the temptation to look at the flashing bar that sweeps across the screen.

Finally, remember that once we get started scanning, do your very best to **keep your head still**. Tell us before we start if you aren't able to remain comfortably in that position for a full hour.