**Consent:**

* Ask these three questions before going over the consent form:
* Are you right handed? (Participant cannot do the experiment if not R-handed.)
* Do you have normal or corrected-to-normal vision?
* Have you ever performed a reaching experiment?
* Write subject ID in top right hand corner of the consent form

“This form covers a lot of the experiments in the lab, but for today only procedure b will apply. Also, we will be tracking your movements through this digitizing pen instead of markers. Let me know if you have any questions. If everything looks okay, please sign and date on the back.”

Enter function in Matlab: extNFB\_game(‘ENFBx’, ‘extNFB’, ‘x’) where ‘x’ is the participant number

**Pre-Experiment Instructions (verbal):**

* “The point of this experiment is to better understand how the brain controls reaching movements. We are especially interested in how motor control is impacted by various neurological disorders, like Parkinson’s disease and cerebellar degeneration. As a healthy student, your data will be used as a normative baseline for future comparisons with these neurological patients. The information we gain from this experiment could help improve rehabilitation for these patients, so please try your best to pay attention and follow all instructions. ”
* “You will be holding this ‘pen’ at the red base and should maintain the same grip throughout the experiment. (Demonstrate how to hold pen) You will be making fast center-out reaching movements towards a blue target that will appear in one of several different locations.” (Physically demonstrate the reaching movements)
* “I will give you time to adjust the seat height and scoot in close to the work station; you will be making many reaches towards the end of the tablet, and I want you to be able to do that without moving any parts of your body other than your arm.” (demonstrate)
* “Try to keep the same posture throughout the experiment.”
* “Rest your left hand in your lap.”
* “I will talk you through the first several trials.”
* “Do you have any questions?” (Run game code and switch seats.)
* “I’ll give you a minute to get comfortable before turning out the lights.”

**Block structure: 10 no fb > 10 fb > 3 practice > 180 clamp > 120 no fb [numbers signify cycles, except for practice trials; there are breaks every 80 cycles once the clamp starts]**

**No feedback:**

“In the center of the screen is a white circle, and you will begin every trial from this position. When you move your hand close to the circle, a cursor representing your hand will appear. Place the cursor into the circle and a blue target will appear. During this first block of trials, you will not be able to see the cursor, but the goal is always the same: aim directly for the target and try to slice through the target with your hand. Always reach as accurately as possible, moving in a quick, straight line.”

*Knocking sound:* [Make sure people understand the knocking sound has nothing to do with reach accuracy.] “The knocking sound you hear means that you moved fast enough and far enough for a valid trial. It does not mean you hit the target. There is no special sound for hitting the target.”

*Too slow:* “The too slow message means that you did not move fast enough for a valid trial. Remember to slice through the targets with your hand.”

**Veridical Feedback:**

“Great job. During this next block of trials you will be able to see the cursor and will have full control over it. The goal is still the same, always aim for the target and try to slice through it with your hand.”

**Practice trials:**

“Great job. During this next long block of trials, you will still be able to see the cursor but you will not have control over its direction. You should ignore the cursor as you continue to try to slice through the target with your hand. As an example of what I mean by the cursor’s direction not being under your control, we will go through a few practice trials. In this first practice trial, after the blue target appears, move your hand quickly to the left.”

“Did you see how the cursor moved when you did, but it followed a fixed path independent of your hand?... On this next practice trial, after the blue target appears, move your hand quickly to the right… On this last practice trial, move your hand toward yourself.”

“Is it clear now that the cursor’s direction is not under your control?... For this next block of trials, the cursor will move toward the target like it did in the practice trials. But now I want you to reach directly for the target. Remember to ignore the cursor and always aim directly for the target.”

**Error clamp break 1:**

“Great job. Now’s your time for a break. [Make sure participant rests for 30-60 s.] Now return to the same body position and pen grip as before. Everything will be the same once we start back up. You will not have control over the cursor’s direction, so remember to keep ignoring the cursor and always aim directly for the target.”

**Error clamp break 2:**

“Great job. Now’s your time for a break. [Make sure participant rests for 30-60 s]. Now return to the same body position and pen grip as before. Everything will be the same once we start back up, but in a little while you will no longer see the cursor. Even though you won’t see the cursor, continue to aim directly for the target.”

**No feedback block break:**

“Great job. Now’s your time for a break. [Make sure participant rests for 30-60 s]. Now return to the same body position and pen grip as before. Continue to aim directly for the target.”