

At the mock scanner

Use the time at the mock scanner to explain as much as possible about scanning procedures. When the subject gets to the real MRI scanner, s/he should not be hearing anything for the first time. Things to explain to the subject while at the mock scanner:

- *Have you ever had an MRI scan before? Great!*
- *During the MRI scans, you will be lying on a table similar to this, that slides into the scanner. The sides of the scanner are just plastic, so it's fine to touch them while you're in there. The most important thing to remember is that you have to be very still from head to toe during the scan. If you move, the pictures of your brain will come out blurry and we won't be able to use them. You should breathe normally and blink your eyes normally, but try to stay as still as possible. Even swallowing can make your head move. Of course you can swallow, but try to do it without moving your head.*
- *We'll be in a room right next to you and we'll be able to see you through a glass window. We'll be communicating with you through an intercom. This is a one-way intercom, which means that either you can hear us speak or we can hear you speak, but both cannot be happening at same time. So, if we ask you a question, wait for us to finish talking before you answer.*
- *We'll also give you a squeeze ball, and you'll be holding it in your hand the whole time. You can use the squeeze ball to let us know if you are not feeling well at any point during the scan, and we'll stop the scan and take you out. **So you're in control.** If you decide that you want to stop the whole thing and go home, you can do that.*
- *Each scan will be about 5-10 minutes long. Between scans we will always be talking to you to let you know that the next scan is about to begin, how long it will last, and what you need to do during that scan.*
- *During the scans, the scanner makes very loud noises. We'll give you earplugs to protect your ears. While a scan is happening, the intercom is turned off, so if you need to communicate with us while a scan is going on, you'll have to squeeze the squeeze ball and we'll stop the scan and talk to you right away. Please remember that if you squeeze the squeeze ball during a scan, that scan has to stop and then we have to throw it away and start it over. So we ask you to only use the squeeze ball during a scan if it's an emergency and you need to get out of the scanner right away. Otherwise, wait for that scan to be over and we'll be checking in on you.*
- *There are two types of scans:*
 - *During one type of scan, you won't have to do anything in particular. You can keep your eyes open or closed. You could even fall asleep during this type of scan, as long as you don't move your head while you sleep. During these scans, we will be playing a movie with animals in nature and you can watch it if you want.*
 - *During the other type of scan, you'll have to do some tasks. You'll get to practice these tasks before you go into the scanner. There are 4 different tasks and in each one you'll be looking at some pictures on the screen and responding by pushing buttons on a button box that we'll give you. Even when you're pushing buttons, it's important that the rest of you stays as still as possible.*
- *For the scanner to take pictures of your brain, your head needs to be in a special helmet. We'll put padding under your head and on the sides to make you comfortable. That helmet is the part that the scanner takes pictures of, so it's important to stay in the same spot inside the helmet the whole time. In between the scans, when nothing is happening,*

you might want to stretch your legs or scratch your nose, for example, but make sure that you don't move your head in or out of the helmet.

- *While we're setting you up, it's important to let us know if anything is uncomfortable, like a strand of hair that's in your face, or your ear is getting squished, or anything like that. It might not seem annoying at the time, but it can get annoying after you've been in there for an hour. So we want to take the time to make you as comfortable as possible from the beginning, to make sure that you can stay as still as possible for the whole session and we can take good pictures of your brain.*

Task practice instructions

Please read, memorize, and administer these instructions to each participant. Instructions should be given *verbatim* before the participant begins the practice tasks. Verbal instructions are in italics.

Resting state instructions: Referred to as the *Plus Sign Task* to the participant. These instructions are given immediately before practicing this task.

The first task you'll do in the scanner is the Plus Sign Task. During this task, you will be asked to hold still and stare at a plus sign in the middle of a blank screen. This will last for about 5 minutes and afterwards you'll see some questions and answer by pressing buttons. You will do this a total of four times during the scan session but they will be spaced out in between other scans. We ask that you please stay awake each time and hold very still during these scans.

Explain the button box and begin the practice. When the questions about falling asleep and drifting thoughts come up, ask the subject to press *Yes* so that they see all the options. Explain that when they use the button box there will be a button under each finger.

Gambling task instructions: Referred to as the *Money Task* to participant. These instructions are given immediately before practicing this task.

The second task that you will perform in the scanner is the Money Task. In this task you will play a guessing game where you will try to guess whether a number that comes after a question mark is greater or less than 5. The question mark will appear on the screen for a short amount of time, and you have to guess and press your index or middle finger during that time. If you guess correctly, you will see a green arrow pointing upward and a plus one-dollar sign appear on the screen. This means that you will get one dollar added to your payment. If you guess incorrectly, you will see a red arrow pointing downward and minus fifty cents appear on the screen. This means that you will have fifty cents taken from your winnings. Sometimes you will see a gray, doubled-headed arrow. This means that the number was five, and you did not win or lose any money. As said before, the question mark will only be on the screen for a short amount of time and things will be moving pretty fast, so try to pay attention and get your guess in right when you see that question mark. If you do happen to miss a number, the computer will continue on, so you should just continue guessing when the next question mark comes up. This is just practice to get you acquainted with the task, so there are no actual wins or losses here. However, in the scanner you will be playing for real money so it is important that you pay attention and try your best to guess correctly. The instructions will also be shown to you in the beginning of the task. Make sure that you take your time to read them again.

Begin the practice task. Make sure the participant reads the instructions, even though you articulated it to them. There are nuances to performing the actual task (like which button to press) that are not captured in the above text.

On the fixation cross in the beginning:

Whenever you see a plus sign on the screen, in any task, you have to pay attention because this means that something is about to happen.

After the subject finishes the practice run, ask:

Was that clear? Do you need to practice it again?

Face matching task instructions: Referred to as the *Picture Matching Task* to the participant. These instructions are given immediately before practicing this task.

Now you will practice the third task you will perform in the scanner. This is the Picture Matching Task. In this task you will see three pictures. You will use the button box to tell us which of two pictures on the bottom matches the one picture on top. Most of the time you will see pictures of faces, but sometimes you will see pictures of fruits and vegetables. Do your best to get your answers in. If you happen to miss one, the computer will continue on; please move onto the next one. Again, it's important to read the instructions in the beginning of the task, and to pay attention while the plus sign is shown because the task can start any second.

Begin the practice task. Make sure the participant reads the instructions and is performing the task correctly. After the subject finishes the practice run, ask:

Was that clear? Do you need to practice it again?

Conflict task instructions: Referred to as the *Picture Difference Task* to the participant. These instructions are given immediately before practicing this task.

The Picture Difference Task is the final task you will perform in the scanner. In this task you will tell us whether two pictures are the same or different. Four pictures will appear on the screen. Each time you have to pay attention to two of them and ignore the other two. You will be instructed to either judge the top and bottom pictures, OR the pictures on the sides. When you see gray rectangles on the top and bottom of the screen, this means that, in the coming series of pictures, you have to tell us if the pictures on the top and bottom of the screen are the same or different. When you see gray rectangles on the sides of the screen, this means that, in the coming series of pictures, you have to tell us if the pictures on the sides of the screen are the same or different. These pictures will flash on the screen for less than a second, so please pay attention--it's okay to guess. You also won't have to make your guess right when the pictures appear for this task. If you happen to miss a response, the computer will continue on; don't worry, just move on to the next one.

Begin the practice task. Make sure the participant reads the instructions and is performing correctly, **both for the horizontal axis and for the vertical axis**. It is imperative that the participant understands the axis manipulation. CONFIRM that the participant is judging the pictures in the appropriate axes (can check feedback from the command prompt at the end). After the subject finishes the practice run, ask:

Was that clear? Do you need to practice it again?

Walking to the eye-tracking room:

So those are all the tasks involved with the MRI scan. We will now go to a different room and have you perform a 20-minute task where you will wear a helmet with tiny cameras that will track the movement of your eyes.

- Ask the parent to wait at the lunch table area.

At the eye-tracking room:

Make sure the right-side computer monitor is plugged in and the eyelink program is showing.

Setting up the laptop:

- Place laptop at an unobtrusive area on the table.
- Connect it the left-side computer monitor (the thick one) and the Mac keyboard/mouse.
- Close laptop lid so the desktop only shows on the monitor screen.
- Connect the ethernet cable to the laptop. (Used to establish connection to the eyelink program)
- Make sure the wifi is connected to 'phswifi3' - accessed via Partners username and password. (Necessary to use the MATLAB license)
- Click the MATLAB icon. 'dotprobe_v13' should be open.

Setting up the eye-tracker:

- Place chin-rest near the edge of the table, directly facing the monitor
- Ask subject to take a seat and adjust the seat height to a comfortable position for the chin-rest
- Place helmet on subject. Adjust the position so the black bar is directly above the eyebrows, and tighten until the helmet is secure but not uncomfortable for the subject.
- Use the black mouse connected to the desktop to click 'Set up cameras' on the eyelink program. Make sure you are on the 'Binocular view' setting.
- Coordinate with the eyelink display on the second monitor to adjust the eye positioning, making sure all of both eyes are in frame and in focus, only the pupils are highlighted (in blue), and that the actual cameras aren't blocking the subject's view.

On the laptop:

- Run 'dotprobe_v13'. Input the BANDA subject name and click OK. A link open caption should appear on the eyelink program.

Talk to the subject:

In this task you will be asked to indicate whether a dot appears on the left or right of the screen. You will place your head on the chin-rest, and use the '1' and '2' buttons on the keyboard to indicate the dot's position. You may blink normally, but do your best to keep your head still and keep your eyes on the screen the entire time. The task will last around 10 minutes, with four breaks in between where calibration tests will be administered on the screen. The full instructions will appear on the screen before the task starts, so please take your time to read

through them and let us know if there is any confusion. You will begin with a practice run. Do you have any questions?

- Make sure the subject is in position.
- Turn off the lights and rotate the eye-link monitor away from the subject's view and towards you.

Talk to the subject:

We will start by calibrating the computer to your eye position. Please follow the dot. This is not part of the task.

On the eyelink program:

- Make sure the program is on Binocular view and click 'Calibrate'.
- A dot should appear in the center. Wait for the eyes to stabilize and click 'Accept fixation'.
- Let the program run through the calibration. If it gets stuck on one of the points, manually click 'Accept fixation'.
- When calibration is complete, click 'Validate'.
- A dot should appear in the center. Wait for the eyes to stabilize and click 'Accept fixation'.
- Let the program run through the validation. If it gets stuck, manually click 'Accept fixation'.
- Rerun steps if needed. (May need to readjust eye positions if unable to pass calibration/validation)
- After validation finishes, make sure the setting is on 'Binocular View' before accepting

On the laptop:

- Indicate to the subject that she/he will now begin the task.
- Click 'Esc' on the Mac keyboard connected to the laptop.
- Let the subject run through the practice set.

On the eyelink program:

- A calibration test prompt should appear on the screen. Indicate to the subject that she/he will now perform a calibration test before continuing with the actual task. Once they continue the prompt, ask them to stare at the dot that appears.
- Click 'Accept' when the two eye points are at the center of the screen. (May have to first click once in the beginning for the positions to self-adjust)
- If the test fails, the eyelink program will ask to recalibrate. (Follow the steps above)
- If the test passes, the subject's screen will prompt the subject to continue the task.

Repeat as above for three more sets of the calibration tests before each task run. Make sure subject is staying very still with their chin on the chin rest.

Troubleshooting:

- *If eyelink program needs to restart - click 'Terminate program'. The program should close and a command prompt screen should appear. There should be a keyboard on top of the desktop under the table. cd to C://EYELINK2/EXE. Type 'eyelink2.exe' and run on the command prompt.*

- *If the calibration/validation fails (due to erratic eye movement or lost eye position) - reposition eyes. Make sure the cameras aren't too close and the program is identifying the pupils correctly.*
- *If you need to start over the whole task - Force quit the task on the laptop and restart MATLAB. May need to restart the eyelink program as well.*
- *For additional issues with the eyelink program - there should be a red binder in the room containing an instruction manual for the program.*

Walking to the scanner room:

1. Ask if they use glasses.
2. Explain they will fill the screening form.
3. Explain that they need to change into hospital gowns.
4. If it's a girl, explain that they will do the pregnancy test.

Before the scan

1. Make sure the subject has gone to the bathroom (administer pregnancy test if female).
2. Make sure that there is nothing metallic, no jewelry, no piercings, no hair clips or hair elastics on the subject. Ask the subject to show their neck, wrists, and ankles.
3. Check if the subject needs glasses.
4. Enter the scanner room **BEFORE** the subject and then ask the subject to walk in slowly.
5. Make sure the subject puts on the earplugs correctly.
6. Make sure the subject's head is as close to the top of the head coil (refer to it as "helmet") as possible.
7. Ask the subject to test the squeeze ball. Explain that before each scan starts the subject will use the squeeze ball to let us know that she/he is ready. Give the subject the button box, making sure the fingers are aligned correctly.
8. Ask the subject not to cross her/his arms or legs.
9. Check repeatedly that the subject is comfortable.
10. Remind the subject to **STAY AS STILL AS POSSIBLE**.
11. Landmark at the subject's eyebrows.
12. Make sure that the subject holds her/his arms close to the body as you send her/him in.

At the console room

1. Check if the subject can hear you, and if you can hear the subject. Ask the subject if she/he wants you to adjust the volume.
2. Check if the subject can see the entire screen.
3. If you haven't done so earlier, ask the subject to test the squeeze ball.
4. Start the movie from the laptop (laptop password: cny149).
5. Make sure that the **button box USB is connected** to the laptop.
6. Make sure that the **trigger button is ON** (pointing up).

Scan instructions

On the scanner console:

- From the Patient menu, choose Register.
- In the patient registration window, make sure you **do not include any identifying information**:

- Last name - BANDA subject name
- DOB - 1/1/birth year, Height, Weight (from screening form)
- **Type “Project:BANDA” in the Additional info section** (for database routing later).
- Patient position - Head first, supine
- Performing physician - Yendiki
- Operator - your username:ban
- Click the Exam button.
- In the Patient Confirmation window:
 - Under STUDY, choose INVESTIGATORS > Anastasia > BANDA.2018.04.06.
 - Uncheck the Load Program to Queue check box.
 - Choose Brain from the Body Part menu.
- Click the Confirm button.

Localizer & auto-align

On the scanner console:

- Select the first four scans of the protocol from the right side of the exam card and drag them to the scan queue on the left side:
 - localizer
 - AAHead_Scout
 - HCP_MGH_T1w_MPR_vNav_setter
 - HCP_MGH_T2w_MPR_vNav_setter
- Double-click on the localizer in the scan queue to open it.

Talk to the subject:

We are about to begin the first scan, which will be very short — about 30 seconds. There will be loud noises during this scan that are perfectly normal. You can keep your eyes closed or open. The important thing is to keep your head as still as possible. Whenever you are ready to begin, please squeeze the squeeze ball. Thank you — here comes the scan.

On the scanner console:

- Click Apply (the green check-mark button) to start the scans.

T1

On the scanner console:

- Select ALL the remaining scans of the protocol and drag them to the scan queue at the same time.
- Double-click on the main T1 scan (HCP_MGH_T1w_MPR_vNav) to open it.
- If needed, move the bounding box in the sagittal view (by clicking and dragging the small circle inside the box) to make sure that the box doesn't cut through the subject's nose.

Talk to the subject:

You're doing great in there. This next scan will be a bit longer, around seven minutes. Just like in the last scan, you can keep your eyes open or closed. The important thing is again to keep your head as still as possible. This scan will be a bit louder, with high-pitched noises – that's totally normal. Whenever you are ready to start, please squeeze the squeeze ball. Thank you — here comes the scan, remember to hold still.

On the scanner console:

- Click Apply (the green check-mark button) to begin the main T1 scan.
- After the T1 scan is done, you can tell the subject to relax for a few moments while you're setting up the rest of the scans.
- Wait for the T1 image to be reconstructed (the head next to it in the scan queue will turn white), and look at all the slices of the T1 in the sagittal view, checking for gross abnormalities.

Diffusion - run 1+2**On the scanner console:**

- With the first diffusion scan (HCP_CMRR_dMRI_dir98_AP) open, make sure that its bounding box doesn't clip the top of the brain or the bottom of the cerebellum. You need to check BOTH hemispheres - the subject's head can be tilted, so checking one hemisphere only is not sufficient.

Talk to the subject:

Okay, everything looks great. The next scan will be about 10 minutes long. You can keep your eyes closed or open during this scan, and you can watch the movie if you like. Like before, the most important thing is to keep your head as still as possible. This next scan will be loud and you may also feel some vibrations that change directions, a bit like shaking. That's perfectly normal, it's just how the scanner operates during this scan. Whenever you are ready to start, please squeeze the squeeze ball. Thank you — here comes the scan, please hold still.

On the scanner console:

- Click Apply (the green check-mark button) to run the first diffusion scan. It will take a few moments to start running because the slice prescription will first be copied to all the other diffusion and functional scans.
- You will see a warning about peripheral nerve stimulation. Click OK.
- When prompted, click Continue to run the first diffusion scan.
- After the first diffusion scan is done, you will be prompted for the second diffusion scan. Click Continue to run it immediately.

Resting-state fMRI - run 1+2

NOTE: These should have the same slice prescription as the first diffusion scan. Has anything unexpected happened? Do you need to copy "center of slices and saturation regions" manually?

MAKE SURE THE TRIGGER IS ON!**Talk to the subject:**

You are doing great. Now, we're going to do something a bit different. During the next scan, we will put up a blank screen and a small plus sign will appear in the center of the screen at some point. You have to keep your eyes open and stay awake during this scan, and stare at the plus sign while it's on the screen. You'll do this twice, each time for about 5 minutes. You can blink normally, but do your best to keep your eyes open, look at the plus sign, and keep your head still the whole time. After each of these two scans, there will be some questions on the screen with instructions on how to answer. Whenever you are ready to start, please squeeze the squeeze ball. Thank you — here come the scans, please hold still.

On the laptop:

- Stop the movie.
- Double-click on the “resting” icon on the desktop.
- Check that the participant ID is correct. *Mode* should be set to *Scanner* and *Run* should be set to *AB*. Click *OK* to start.
- The *Please keep your eyes open* screen shows up.

On the scanner console:

- Click Continue to run the two spin-echo scans.

On the laptop:

- When the spin-echo scans are over, press space. The *Waiting for the experimenter* screen shows up.
- Press *Q*. The *Waiting for the scanner* screen shows up.

On the scanner console:

- Click Continue to run the first resting-state scan.
- After the end of the scan, **WAIT** for the subject to answer the questions.

On the laptop:

- After the subject answers the questions, the *Waiting for the experimenter* screen shows up. Press *Q*. The *Waiting for the scanner* screen shows up.

On the scanner console:

- Click Continue to run the second resting-state scan.
- After the end of the scan, **WAIT** for the subject to answer the questions.

Diffusion - run 3+4

NOTE: These should have the same slice prescription as the first diffusion scan. Has anything unexpected happened? Do you need to copy “center of slices and saturation regions” manually?

On the laptop:

- Restart the movie.

Talk to the subject:

Okay, now we'll go back to that type of scan where you don't have to do anything in particular. You can keep your eyes closed or open. We'll put the movie back on, and you can watch it if you like. This scan will be about 10 minutes long. Just like in one of the earlier scans, there will be loud noises and some vibrations coming from different directions. Please continue to hold as still as possible throughout the scan. Whenever you are ready to go, please squeeze the squeeze ball. Thank you — here comes the scan.

On the scanner console:

- Click Continue to run the third diffusion scan.
- After the third diffusion scan is done, you will be prompted for the fourth diffusion scan. Click Continue to run it immediately.

Resting-state fMRI - run 3+4

NOTE: These should have the same slice prescription as the first diffusion scan. Has anything unexpected happened? Do you need to copy “center of slices and saturation regions” manually?

Talk to the subject:

Okay, now we'll go back to that type of scan where you will have to look at a plus sign in the center of the screen. You don't have to do anything else, just make sure that you stay awake, keep your eyes open, and stare at the plus sign. Please remain as still as possible. You'll do this twice, and each time will be about 5 minutes long. After each scan, some questions will appear on the screen like before, with instructions on how to answer. Whenever you are ready to go, please squeeze the squeeze ball. Thank you — here come the scans.

On the laptop:

- Stop the movie.
- Double-click on the “resting” icon on the desktop.
- Check that the participant ID is correct. *Mode* should be set to *Scanner* and *Run* should be set to *CD*. Click *OK* to start.
- The *Please keep your eyes open* screen shows up.

On the scanner console:

- Click Continue to run the two spin-echo scans.

On the laptop:

- When the spin-echo scans are over, press space. The *Waiting for the experimenter* screen shows up.
- Press *Q*. The *Waiting for the scanner* screen shows up.

On the scanner console:

- Click Continue to run the third resting-state scan.
- After the end of the scan, **WAIT** for the subject to answer the questions.

On the laptop:

- After the subject answers the questions, the *Waiting for the experimenter* screen shows up. Press *Q*. The *Waiting for the scanner* screen shows up.

On the scanner console:

- Click Continue to run the fourth resting-state scan.
- After the end of the scan, **WAIT** for the subject to answer the questions.

Money-task fMRI (2 runs)

NOTE: These should have the same slice prescription as the first diffusion scan. Has anything unexpected happened? Do you need to copy “center of slices and saturation regions” manually?

Talk to the subject:

You're doing great. Now we'll move on to the other tasks that you practiced earlier. In the next scan, you are going to play the guessing game, where you try to guess whether a number that comes after a question mark is greater than 5 or less than 5. You will see a reminder of the

instructions on the screen in the beginning of the scan. Once the game starts, you will use the button box in your hand to make your guess. **Remember that now you can win actual money, so try to guess correctly.** Just like the scans before, there will be loud noises during these scans. Please continue to stay very still, even as you are playing the game. You will play the game twice, and each time will be about 3 minutes long. Whenever you are ready to go, please squeeze the squeeze ball. Thank you — here come the scans.

On the laptop:

- Double-click on the “gambling” icon on the desktop.
- Check that the participant ID is correct. *Mode* should be set to *Scanner* and *Run* should be set to *AB*. Click *OK* to start.
- The task instructions show up on the screen. As soon as the subject goes through the instructions, the *Waiting for the experimenter* screen shows up.
- Press *Q*. The *Waiting for the scanner* screen shows up.

On the scanner console:

- Click Continue to run the first gambling scan.
- After the first gambling scan is done, you will be prompted for the second gambling scan - **WAIT**.

On the laptop:

- When the first gambling scan is over, the *Waiting for the experimenter* screen shows up.
- Press *Q*. The *Waiting for the scanner* screen shows up.

On the scanner console:

- Click Continue to run the second gambling scan.
- After the end of the scan, **WAIT** for the subject to answer the questions.

On the laptop:

- Check the total \$ amount won and note it down to add it to the subject payment later.

Picture matching task fMRI (2 runs)

NOTE: These should have the same slice prescription as the first diffusion scan. Has anything unexpected happened? Do you need to copy “center of slices and saturation regions” manually?

Talk to the subject:

For the next scan, you will do the picture matching task that you practiced earlier. Again, you will see a reminder of the instructions on the screen in the beginning of the scan. During the task, you will see three pictures, and you will use the button box to tell us which of two pictures on the bottom matches the one picture on top. Again, please remember to stay as still as possible, even while you’re pressing the buttons. You will do this task twice, and each time will be about 5 minutes long. Whenever you are ready to begin, please squeeze the squeeze ball. Thank you — here come the scans.

On the laptop:

- Double-click on the “face matching” icon on the desktop.
- Check that the participant ID is correct. *Mode* should be set to *Scanner* and *Run* should be set to *AB*. Click *OK* to start.
- The task instructions show up on the screen. As soon as the subject goes through the instructions, the *Waiting for the experimenter* screen shows up.

On the scanner console:

- Click Continue to run the two spin-echo scans.

On the laptop:

- When the spin-echo scans are over, press *Q*. The *Waiting for the scanner* screen shows up.

On the scanner console:

- Click Continue to run the first face-matching scan.
- After the first face-matching scan is done, you will be prompted for the second face-matching scan - **WAIT**.

On the laptop:

- When the first face-matching scan is over, the *Waiting for the experimenter* screen shows up.
- Press *Q*. The *Waiting for the scanner* screen shows up.

On the scanner console:

- Click Continue to run the second face-matching scan.

On the laptop:

- When the second face-matching scan is over and the *Thanks* screen shows up, **press Space** to end.

Picture difference task fMRI (4 runs)

NOTE: These should have the same slice prescription as the first diffusion scan. Has anything unexpected happened? Do you need to copy “center of slices and saturation regions” manually?

Talk to the subject:

Okay, now you are going to do the picture difference task. Again, you'll see a reminder of the instructions for the task on the screen in the beginning of the scan. During this task, you'll tell us whether two pictures are the same or different. Each time there will be four pictures on the screen, and you will be asked to pay attention to the two pictures on the top and bottom, OR the two pictures on the left and right. When you see gray rectangles on the top and bottom of the screen, this means that you should be answering if pictures on the top and bottom are the same or different. When you see gray rectangles on the left and right of the screen, this means that you should be answering if pictures on the left and right are the same or different. Please answer as quickly as you can and remember to hold very still. These pictures will come very fast, so it is okay to guess sometimes. You will do this task 4 times, and each time will be about 4 minutes long. Whenever you are ready to begin, please squeeze the squeeze ball. Thank you — here come the scans.

On the laptop:

- Double-click on the “Focus” icon on the desktop.
- Check that the participant ID is correct. *Mode* should be set to *Scanner* and *Run* should be set to *ABCD*. Click *OK* to start.
- The task instructions show up on the screen. As soon as the subject goes through the instructions, the *Waiting for the experimenter* screen shows up.

- Press *Q*. The *Waiting for the scanner* screen shows up.

On the scanner console:

- Click Continue to run the first conflict scan.
- After the first conflict scan is done, you will be prompted for the second conflict scan - **WAIT**.

On the laptop:

- When the first conflict scan is over, the *Waiting for the experimenter* screen shows up.
- Press *Q*. The *Waiting for the scanner* screen shows up.

On the scanner console:

- Click Continue to run the second conflict scan.

Repeat as above for the third and fourth conflict scans.

On the laptop:

- When the fourth conflict scan is over and the *Task complete* screen shows up, **press Space** to end.

T2

NOTE: This should have the same slice prescription as the T1. Has anything unexpected happened? Do you need to copy “center of slices and saturation regions” manually?

On the laptop:

- Restart the movie.

Talk to the subject:

You’ve been doing great. We have only one scan left to go and it will be about 7 minutes long. We’ll put the movie back on, and you can keep your eyes open or closed during this one. Just try your best to stay as still as possible all the way through. Whenever you are ready to go for this last scan, please squeeze the squeeze ball. Thank you — here it comes.

On the scanner console:

- Click Continue to run the main T2 scan.

After the scan

When the T2 is done, make sure you’re demetaled and enter the magnet room.

- Remove the patient from the scanner, and remove the head coil. I try to start taking the head coil off while the bed is moving down, so that you can take it off asap.
- **something like:** “How are you feeling? How was the scan? You did a great job!”
 - Let them take their time, and if it seems like they’re tired or having a hard time, give them a minute to chill on the bed
- While you’re saying this, take the blue caps off the foam head padding.
- Tell them to drop their ear plugs inside one of the blue caps. Throw the blue caps in the (regular) trash bin.

- **something like:** “Now we’re going to go outside and I’m going to ask you a couple of questions. Then I have a few questionnaires for you to fill out, and after that you’ll be finished and all set to get changed and get out of here.”
- Have them get up and take them out to the console room
 - If they want to go to the bathroom or take a drink, you can let them do that and have them go sit in the waiting area
- Ask them the Debrief questions, and record their responses.
 - Link to Debrief Questionnaire:
<https://docs.google.com/document/d/1tHgB40s167kNbwtLyldzfEgCN7buOg5oQik6fbW6rY/edit?usp=sharing>
- **something like:** “Great, now I’m going to have you sit down out in the waiting area, and have you fill out some questionnaires.”
- Have them sit out in waiting area, and explain the three clinical questionnaires to them.
 - MFQ: “Check one box for each of these questions”
 - STAI (put the “right now” version on top, the “in general” one on the bottom):
 “There are two of these questionnaires. The one on top is asking you about how you feel right now, the one below it is asking about how you feel in general. Circle one answer for each.”
 - **something like:** “So please fill these out, let me know if you have any questions, and let me know when you’re done, and then you can get changed.”

In the magnet room:

- Go clean up the magnet room: take the sheets off the bed, put them in the laundry basket.
 - If the laundry basket is $\frac{2}{3}$ full, take the blue bag out, and replace it with a new bag from the roll on the bottom of the basket.
 - Place the full bag out in the hall across from the changing room.
- Wipe down the squeeze ball, head coils, and button box.
- Put the head pads in the baskets and the leg pad on the counter.
- Wrap the button box cord up and hang it in the closet.
- Turn the projector off. Press the power button, may need to hold it and/or press it twice, until it turns red.

In the console room:

- Put laptop and charging cord in bag. Place dongle in front pouch of bag.
- Wrap up the fMRI USB cord and hang on the wall.

In the waiting room:

- When the participant is done with the questionnaires, grab the papers/clipboard/pen
- Tell them they can change out of the hospital gowns. Show them the laundry basket where they throw their gowns.

In the console room:

- Transfer the scan data

Data transfer

Transfer data to Bourget server.

- On scanner computer, do this:

Patient → Browser → <BANDA0** folder> → Transfer, Send to Bourget

- This starts the transfer. Before leaving, make sure the data is actually transferring or if it needs to be run again.

click: Check Network Job Status; Wait until it says “Entire Patient”, “Spooling”, then you’re good.

Troubleshooting

Projector

If you are having trouble with the projector, you can try disconnecting the laptop, turning off the projector, restarting the projector, and reconnecting the laptop.

- Turn off the projector; let it cool down completely until red light appears on the top of the projector.
- Unplug display cords/dongles from laptop
- Restart projector; let it warm up completely (there is a progress bar on the projected screen)
- Reconnect laptop to display cords/dongles

You also want to make sure the projected screen (that participant will be looking at) is in focus.

- Adjust the focus by turning carefully turning the lens on the projector. Connect the laptop, have a screen that displays text, and adjust focus as needed until text is clear.

Also, make sure that the entire laptop screen is appearing on projected screen, i.e. no important parts being cut off from projected display (I say “important parts” because it’s fine if the very bottom or very top of the screen are truncated, none of the tasks have text/images on the very top/bottom. Just make sure the images for the tasks are not cut off!). Below is a description of what worked recently (11/17/19), but I should look back into this and update...

- On laptop, with projector dongle connected, right click and go to Display Settings. Select “Extend these displays”. Set laptop screen as primary display.
- You can try going to “Advanced display settings” and adjusting the resolution of the screens - couldn’t get this to work the last time I tried, and ended up using the recommended sizes, but I thought we adjusted these in the past... it warrants further investigation.
- On the projector, grab the remote (hopefully it has batteries in it...) and press the “Resize” button. There are 3 different options. I found that “Normal” is the best. But you can play around with it to see if stretching/fitting the screen is better.
- You can check how much of the laptop screen appears on projector by opening the nature movie, pausing it, and keeping your mouse hovered over the play button. Then go into the scanner room and check the screen. It’s OK if the very bottom or very sides are cut off. You can also open the picture matching/conflict tasks, and do a practice run, seeing where the images are on the screen.

If the projector image (including the projector startup screen, not just the image from the laptop) shows up upside down: from the projector menu, make sure that PRJmode is set to Rear.

There might be helpful info on this page:

<https://www.nmr.mgh.harvard.edu/martinos/userInfo/safety/MRscanningTips.php>