General Overview of Activities

Duration	Activity	Details	Location	Personnel
15 min	1. Arrival at BIRC	Additional time to ensure appropriate arrival		
10min	2.Welcome and Consent	Full study informed consent	BIRC	CFR phlebotomist
15 min	3.Blood Draw	Venipuncture blood draw (see separate protocol for more details)	BIRC (blood draw room in MEG/EEG suite area)	CFR phlebotomist
20min	4.Orientation to BIRC	MRI clearance form, Scanner introduction, MRI Instructions, Demo Working Memory Task	BIRC (training room)	Psych Grad students (scanner operator)
30 min	5. fMRI Protocol	Resting State, N-back Task (2 runs) Structural, Resting State (see separate protocol for more details)	BIRC (scanner)	Psych Grad student (scanner operator)
5 min	6. Break (optional)	---		
60 min	7. Post-scan Neurocognitive Tasks	Introduction and explanations; NIH Examiner sections and various others	BIRC (training room)	Psych Grad student (neurocog battery coord.)
5min	8. Break (optional)	---		
15 min	9. Post Scan Questionnaires	Scanner anxiety questionnaire, Self-report questionnaires, HIV Risk Questionnaire	BIRC (room with computer)	Psych Grad student (neurocog battery coord.)
5 min	10. Compensation	Sign receipt/honorarium	BIRC (training room)	Psych Grad student (neurocog battery coord.)

fMRI scan protocols

B. Overview of Scan Session

Scan Session (N-Back Paradigm)	
Scan Description	**E-Prime Experiment File**
Localizers / Calibration	None
Functional Run 1 (Resting State)	RS1
Functional Run 2 (N-back1)	NB1
Functional Run 3 (N-back2)	NB2
Structural Scan	None
Functional Run 1 (Resting State)	RS2

Pre Scan Procedures
Check-in/preparation

1. Participant must complete both sides of the BIRC MRI compatibility screening form. Read to participants before completing:
    a. *Before beginning the study, it is important that we make sure that you are medically compatible to have an MRI. You have already completed this form over the phone, but please review it and ensure that all the information on it is accurate.* (Gather follow-up information as appropriate regarding metal implants, surgeries, medications, etc.)
    b. (CFR staff will have sent Kim Mason a copy and received approval prior to the day of the scan for after hours participants)
    c. ***Please make sure participant signs MRI screening form***
2. <u>Letter Task</u>: Review **"Letter Tasks"** visual aids.
    a. <u>Letter H standardized instructions:</u> *"This next test is a set of two letter tasks. The first is called the Letter H task. During this task, your job is to respond "Yes" (left button with right index finger) when the letter presented on the computer screen is the letter "H" or "h", regardless of capitalization. You are to respond "No" to all other letters (right button with right middle finger)."* **[Show participant example.]**
    b. <u>2-Back standardized instructions:</u> *"This next task is called the 2-Back task. During this task a set of letters will be shown to you, one letter at a time. Your job will be to press the "Yes" button if the letter on the screen matches the letter that was presented two letters back in the sequence, regardless of capitalization. You are to press the "No" button if the letter two before was not the same letter. Let me demonstrate with this picture."* **[Show participant example. Note possible overlap (i.e., there can be two "yes" responses in a row)]**
    c. Open N-back practice file

        i. Computer practice instructions: "*Let's try the 2-Back task on the computer.* **A crosshair will be presented between each letter. During the MRI scan the crosshair will sometimes stay on the screen for longer periods of time.** *The 2-Back and Letter H task will alternate during the MRI scan and instruction screens with red lettering* **[advance to next screen to show lettering]** *will always tell you which of these two tasks you need to do next. I would like you to practice this now just to get the hang of things. This practice will be self-paced now so that you can learn how to do it. When you go in the scanner later today, it will not be self-paced. The first time we will walk through it together and I will give you feedback as you are learning the task.*"

        ii. Ask participants to proceed through training. Have them say answers aloud. Record responses on data sheet. Make sure they are pressing the corresponding button correctly. Give corrective feedback during the instructions run.

        iii. If participant answers ≤ 75% (<10) of the items correctly, repeat the practice.

3. Participant should put all belongings into a locker next to restrooms (including all items from pockets, removable jewelry, belts, eye glasses, hair accessories, etc.)
   - While participant is securing belongings, check self-report assessment to ensure all questions are complete and answers are clear. If not, clarify with participant before entering MRI room
4. Participant should use restroom prior to entering MRI room (even if they say they don't need to go, please ask them to try)

Preparing the MRI Room for Participant
1. Research staff should make sure that all belongings are removed from their person (including all items from pockets, removable jewelry, belts, eye glasses, hair accessories, etc.)
2. Set up no-mo-co pillows
   a. Thin head pad should be placed on head rest of coil, underneath the table paper. Also place thick neck roll under table paper.
   b. Thin wedge pads should be available if needed after headphones are positioned within the coil
   c. Also need long, thin head strap piece
3. Make sure that fresh table paper is positioned for the participant and that it is ripped from the roll
4. Tasks for CNL Graduate Students Trained to Scan **ONLY:**
   a. Login to computer
   b. Enter participant information within the MRI console from MRI compatibility screening questionnaire
   c. Obtain a log sheet for the scan from the MRI logbook
   d. Turn on the stimuli computer using the instructions above the stimuli computer
   e. Sign into matlab for the purposes of data transfer
      i. Create appropriate folders for raw data transfer:
             RS   NB1   NB2   RS2   ANAT

ii.   Navigate to rest folder to prepare for 1st file transfer
5.   Locate experimental EPrime folder on Stimuli Computer

Scanning Procedures

Entering MRI room/ putting participant in scanner
1.   Escort participant into MRI room for setup
2.   Provide pair of ear plugs and instruct participant as to how position earplugs effectively
3.   Ask participant to lie down on table with head facing magnet bore
4.   Place knee/leg pad under legs
5.   Raise MRI table
6.   Place head strap piece across forehead and then secure. Velcro head strap attached to coil
7.   Position headphones on the participant and ask him to reposition headphones and microphone to where it is comfortable
8.   Explain how the button on the headphones work to speak to the researchers during the course of the experiment
9.   Position goggles over eyes and hold in place as coil is slid over head and locked in place. Use tape to secure the goggles to the coil
10. Ensure proper head alignment (nose should be facing directly vertical when looking from feet; adjust left/right as necessary prior to putting in head pads)
11. Insert padding on left and right side of headphones if needed. Participant should be snug, but comfortable. No Mo Co wedges or grey padding should be sufficient
12. Place response boxes in appropriate hands. Position participant's fingers on the proper buttons. Drape cord around participant's foot to prevent boxes from falling
13. **A trained MRI technician or graduate student** should perform alignment procedure and should advance participant into the scanner to begin scan

Scanning Procedure (See scanner manual for details)
1.   **LOCALIZER / CALIBRATION SCANS**

     *NOTE: For Functional Scans and Anatomical Scans data transferring should always be occurring in background (i.e., during scans).

2.   **RESTING STATE 1**
     ▪ Open Resting State Folder and experiment but do not click "OK" yet
     ▪ **E-prime File: AIB Resting State**
     ▪ Read the following instructions: "*In a moment, we will be collecting a 4-minute scan. All we would like you to do is to remain still and keep your eyes fixated on the cross on the screen.*"
     ▪ Click "OK" on the E-prime experiment once the MRI technician is ready to begin scan.
3.   **N-BACK TASK**
     i.   Open NBACK Folder and experiment but do not click "OK" yet
     ii. **Run 1**
          1. **E-prime File: AIB NBACK RUN_1.ebs2**
     iii. **Run 2**
          1. **E-prime File: AIB NBACK RUN_2.ebs2**
     iv. Before the first run, read the following instructions: "*We're now going to do the letters task. Remember, use your right index finger for 'yes' and your right middle*

finger for 'no'." Also remember that in the letter H task, you will be answering yes for H and no for anything else. For the 2-back task you will answer yes if the letter as the same as the one you saw 2 letters ago and no for everything else.

v. Before the second run, read the following instructions: "*We are going to do another run of the same thing."*

vi. Click "OK" on the E-prime experiment once the MRI technician is ready to begin scan.

vii. Before beginning each run, ask participant how they are doing and tell them "w*e are now ready to begin the next run of the task."*

4. **Structural**

   i. Read the following instructions: *"In a moment, we will be collecting a 6 minute structural scan. All we would like you to do is to continue to remain as still as possible."*

5. **RESTING STATE 2**

   ▪ Open Resting State Folder and experiment but do not click "OK" yet

   ▪ **E-prime File: AIB Resting State**

   ▪ Read the following instructions: "*In a moment, we will be collecting a 4-minute scan. All we would like you to do is to remain still and keep your eyes fixated on the cross on the screen."*

   ▪ Click "OK" on the E-prime experiment once the MRI technician is ready to begin scan.

Removal from scanner / equipment tear down

1. Remove Button boxes

   i. Place on appropriate hooks on side of the MRI scanner

2. Remove the participant from the scanner using "Home" button

3. Remove side padding and return to top of small cabinet

4. Remove tape from goggles

5. Remove goggles and coil from participant's head

   i. Return goggles to hook on side of MRI scanner

   ii. Return headphones to hook on side of MRI scanner

   iii. Coil should be completely unhooked from table and sit within the bore of the magnet

6. Remove Padding and store appropriately

   i. Return NoMoCo pads to the package, return the package to the storage closet, top shelf

   ii. Return imaging center pads to top draw under box of earplugs

7. Lower the participant from the scanner using "Down" foot lever

   i. Remind the participant to get up slowly

   ii. Take earplugs from participant (can be thrown out)

8. Escort participant out of room and to the next phase of the experiment