**High-Low Resolution STM & Perception – Version 1**

This file contains brief notes and instructions for the tasks in this experiment. First, some general notes and procedures are outlined, and then instructions specific to a task are listed in separate sections.

**1. General Notes**

There are three phases to this experiment:

* Gabor task (perception control task)
* Short-Term Memory task
* Perception task

The task should be run in the order listed above using the following scripts:

* gabor\_task\_proc.m
* stm\_task\_proc.m
* perception\_task\_proc.m

Upon running the first script, you will be asked to enter a subject ID (the variable in Matlab is subID). You will only be asked this the first time you run one of the three scripts, and will not be asked again as the subsequent scripts will use the same subID. You will also be asked to enter a phase, and for each one there is a practice and real (i.e., critical) phase.

If you are running a real phase, you will be asked for a material ID (the variable for this in rngSeed). This value must be numeric, if used, and seeds the random number generator in the stimulus generation scripts. This will be useful for the patient part of this study, as the stimuli for a patient can be yoked to controls (by using the same seed for the random number generator used to create the stimulus). To use this, just pick a random number (e.g., 2143) for a patient, and make sure to type this number in for the material ID for both the patients and their yoked controls. This does not need to be used for the pilot, and you can just press enter to skip this (with a blank value.

**2.** **Setting Options in the \*proc.m scripts**

The stimulus presentation options, such as timing and image size, are listed towards the top of each stimulus display script under the heading Timing and Size Options. Most of these have notes to the right as to what they indicate. Any variables for duration or timing are in seconds (not ms), and sizes are in pixels. The variable delta, which is a structure variable, controls the degree of rotation between target and lure items in the short-term memory task and the rotation of trials labeled as “different” in the Gabor and Perception tasks.

Also, there is a variable called breaks, which indicates when breaks will happen. When breaks occur will be described in each task separately.

**3. Gabor Task**

This task is meant to serve as a perceptual control for the orientation of images without trial-unique objects or associative complexity. On each trial participants are shown 2 Gabor gratings (no Gaussian filter, simple circle filter), one on each side of fixation. This is presented briefly, and participants are asked to determine when the two Gabor images have the same rotation or not. If they are the same, participants should press the “F” key. Otherwise, they should press the “J” key to indicate that the two images have different rotations. Responses are self-paced, but encourage both speed and accuracy.

There are a total of 8 trials in the practice phase and 160 trials in the critical phase. Half of the trials in each phase are ‘same’ trials (both Gabor images are rotated the same degree) and half of the trials are ‘different’ trials (the two Gabor images have different rotations). On different trials, the lure Gabor image is rotated ±13°. There are no breaks in the practice phase, and there are breaks every 40 trials in the real version of the task.

After completion of this task, give participants a 5- to 10-minute break.

**4. Short-Term Memory Task**

In this task participants will study sets of 2 to 4 objects, each of which are rotated to a pre-specified degree. During the study portion of each set (following a green +), each object on the screen is displayed simultaneously on the screen for 3 seconds. The goal is to remember the orientation of each object in the set. After the study display, there will be a 1 second delay before the test portion of the set. In the test phase, each object will be shown (one at a time) in two different orientations, and participants are tasked with selecting the object that has the exact same rotation as it did during the study phase. Test responses are self-paced, but encourage both speed and accuracy.

There are four types of blocks formed with the set size manipulation (2 vs. 4) and resolution (low vs. high). The lures on low and high resolution trials are rotated ±45° and ±20°, respectively, from the original study rotation.

There are a total of 36 set size 2 blocks each for the low and high resolution conditions, and a total of 18 set size 4 blocks each in the low and high resolution condition. The blocks are randomly presented to participants. In the practice phase there is one trial from each condition just described.

There are no breaks in the practice phase, and there are breaks every 36 trials in the real version of the task (for a total of 2 breaks during the task).

After completion of this task, give participants a 5- to 10-minute break.

**5. Perception Task**

In this task participants will see one object on the screen in 2 or 4 different locations. The locations will be identical to those seen in the short-term memory task. Each display of an object will be presented very briefly (500 ms), and there are two types of trials. Same trials have all 2 or 4 objects on the screen rotated the exact same, whereas Different trials have 1 of the 2 or 4 objects rotated differently from the others. The task for participants is similar to the Gabor task; they should determine whether all of the objects on the screen have the same rotation or if one is different (i.e., if one has an odd-ball). After the display is removed from the screen, participants should enter their Same/Different judgment quickly while trying to maintain accuracy.

In total there are 288 trials (one for each object), and there are 8 different trial types. The trial types are factorized across the set size manipulation (2 vs. 4) and resolution (same vs. low vs. middle vs. high). The lures on low, middle and high resolution trials are rotated ±45°, ±20°, and ±13° respectively. The quadrant/position of the lure item is balanced across trials. In the practice phase there is one trial from each condition just described.

There are no breaks in the practice phase, and there are breaks every 48 trials in the real version of the task (for a total of 5 breaks during the task).

After completion of this task, participants will be finished with this study.