Instructions for Frequency Tuning

subjID: subject number

uniID: University ID (e.g., “umn” for University of Minnesota or “bu” for Boston University”)

This task uses results from the “2)AbsProbe” task to set the individualized sensation level of the probe tone. All three runs of AbsProbe must be run before running this task, otherwise you will see “Data file for subject ‘subj’ not found” printed to the command window.

1. Type in the Matlab command window: FrequencyTuning(‘subj’, ‘uniID’)
2. The FrequencyTuning function will place Psychtoolbox at the top of your path. The text that prints on the screen is automatically generated by Psychtoolbox and can be ignored.
3. Read the following instructions to the subject:

“In this task, you will hear a pulsing tone in your right ear. Throughout the task, you will be listening for this pulsing tone. Shortly after the task begins, you will hear noise, and the noise will be presented for 4 minutes. Try to ignore this noise and just listen for the pulsing tone. Throughout the 4 minutes, press and hold down the space bar for as long as you hear the pulsing tone. Make sure to hold DOWN the spacebar the entire time you hear the beeping tone- this will make the noise louder. Once you can no longer hear the tone, release the space bar. This will make the noise quieter. And again, once you hear the pulsing target tone, you will press and hold the space bar. You will do this for 4 minutes. This first sweep is a practice sweep. Once this sweep is over, come let me know. Do you have any questions? [Double check for comprehension if necessary; consider asking the participants to repeat back the instructions if they look confused. Make sure the right side of the headphones is over the right ear, as this is a monaural task.] Once the door is shut, you may press any button on the keyboard to begin.”

1. **After each sweep, a figure will appear with the results. Please check the results to make sure the tuning curve looks normal (i.e., like a “v” shape; see figure below). If it is extremely wide, flat, or funny-shaped, this may indicate that the subject did not understand the instructions. Wide tuning curves will occur if the participant has hearing loss, so do not be alarmed if you observe this in subjects with loss at 4 kHz. Please very carefully check that the subject understands the instructions before beginning the next sweep.**



*Example tuning curve for a typical normal-hearing listener for the reversed masker center-frequency condition. The center frequency of the noise is plotted on the x-axis and the level of the noise needed to mask the target tone on the y-axis. The datapoint near 6 kHz at 50 dB SPL indicates the level of the noise at the beginning of the sweep.*

1. To begin the next sweep, close the figure. Then, type the following in the command window: FrequencyTuning(‘subj’, ‘uniID’)
2. Read the following instructions to the subject:

“Now you will complete two more sweeps, with each sweep lasting 4 minutes in duration. This task is the same as the practice sweep, where you will hold down the space bar whenever you hear the pulsing tone. After you have finished a sweep, let me know, and I will take a look at your data to make sure the task was run correctly, and then I will set up the next task. Any questions?”

1. Repeat step 5 to begin the third sweep.
2. Once all 3 sweeps are completed, you may continue to the next task. If you try to run the FrequencyTuning function again, even when all three sweeps have been completed, the following message will print on the command window: “Participant ‘subj’ has already completed all 3 runs.”

The results are stored in the “data” folder; each subject has their own .mat file. The “runOrd” variable stores the order of the noise-sweep direction; 1 corresponds to a forward-sweeping noise and 2 corresponds to a reverse-sweeping noise. The columns of runOrd correspond to the run number (1, 2 and 3), with 1 being the first run. The “allResults” variable is a cell array with the results for each run. For example, typing “allResults{1}” in the command window will show the results for the first run. Column 1 is the center frequency of the noise, column 2 is the level of the noise, and the rows are the turn points (plus the level of the noise at the beginning of the sweep and any times the noise hits the ceiling/floor level).