## Running the experiment

Sections marked as (Optional) are not required to conduct the experiment as is.

1. **Inspect screen refresh rate with a Photodiode –** (Optional)

I tested the screen at 118B once, so there is no need to do this again.

But if you wish to do so nevertheless:

* 1. Make black/white textures – in initConstants.m, below FIXATION\_TXTR, create BLACK/WHITE\_TXTR with the ‘black/white\_screen.jpg’ files.
  2. Replace fixation with a black screen –in initConstants.m assign FIXATION\_TXTR = BLACK\_TXTR.
  3. Change masks to black/white screens – in main.m after trials are generated apply this snippet:

Trials.mask1 = repmat(p.WHITE\_TXTR, height(trials), 1)

Trials.mask2 = repmat(p.BLACK\_TXTR, height(trials), 1)

Trials.mask3 = repmat(p.BLACK\_TXTR, height(trials), 1)

Replace prime and target with white screen – in showWord.m replace ‘DrawFormattedText…’ with Screen(‘DrawTexture’, p.w, p.WHITE\_TXTR).

* 1. Replace categorization screen with a black screen – in getTraj.m replace p.CATEGOR\_TXTR with p.BLACK\_TXTR.

1. **Generate masks –** (Optional)

If you don’t wish to use the existing masks:

* 1. In experiment.m run the first section and then the “Generate Masks” section.
  2. Make sure the shapes' line thickness matches that of the Font used for the word stimuli.
  3. Verify the area covered by the shapes matches the one described in the Methods section of the paper and covers the word stimulus.

1. **Modify stimuli (targets/primes) –** (Optional)
   1. Add words to word\_freq\_list file. Words can’t include ‘ן’, ‘ף’, ‘ץ’, since these letters are taller than other letters.
   2. Verify [word frequency](http://word-freq.mscc.huji.ac.il/wordfreq.asp) is at least 10 per million.
   3. Use genWordLists.m to create the following lists:
      1. Art\_targets.xlsx
      2. Nat\_targets.xlsx
      3. Art\_primes.xlsx
      4. Nat\_primes.xlsx
   4. Create trial lists – (Optional)

Trial lists dictate the order of stimuli in the experiment.

* + 1. Run ‘Generate trial lists’ section in experiment.m with following parameters:
       1. Num\_trial\_lists – the number of lists to create.
       2. List\_type – is this list intended for the ‘practice’ session or the ‘test’ session?
    2. Examine scripts’ output: Frequency of all words in the “targets” graph should be identical.
    3. Make sure each list was generated properly with run\_tests.m:
       1. Define:
          1. Word\_list – name of list
          2. List\_type
          3. Test\_type - ‘trials\_list’.
       2. Run run\_tests.m which verifies:
          1. Event duration – stimuli was presented for the appropriate duration.
          2. Has values - all fields in output data contain values (not nan).
          3. Relations – Verifies prime/target/distractor category (natural/artificial) suites the condition (congruent/incongruent) and verifies prime+target or prime+distractor don’t share letters in common locations.
          4. Conditions – each condition appear the appropriate number of times.
          5. Target repetitions – don’t occur within a single block.
          6. Prime right/left alternations – primes appear the same number of times on the left side as on the right side.
          7. Count trials and blocks – matches planned experiment’s length.
       3. All tests should produce ‘1’, except for ‘event duration’ and ‘has values’ tests which aren’t relevant.

1. **Become familiar with stimuli files –** 
   1. Word\_freq\_list.xlsx - all words and their frequencies.
   2. Art\_targets.xlsx - first line = natural primes. Each prime’s column includes all artificial targets it can precede (since they don’t share letters in common locations with it). Order of columns is identical to order of rows in word\_freq\_list.xlsx.
   3. Nat\_targets.xlsx - first line = artificial primes. Each prime’s column includes all natural targets it can precede (since they don’t share letters in common locations with it). Order of columns is identical to order of rows in word\_freq\_list.xlsx.
   4. Nat\_primes.xlsx - first line = natural distractors. Each distractor’s column includes all natural primes it can complement in the prime recognition task (since they don’t share letters in common locations with it). Order of columns is identical to order of rows in word\_freq\_list.xlsx.
   5. Art\_primes.xlsx - first line = artificial distractors. Each distractor’s column includes all artificial primes it can complement in the prime recognition task (since they don’t share letters in common locations with it). Order of columns is identical to order of rows in word\_freq\_list.xlsx.
2. **Become familiar with subject\_log.xlsx –**

password is ‘khen123’

1. **Connect OptiTrack, open Motive and calibrate it –**

Follow instructions in “SOP - Mudrik lab Exp 4.doc” file under section “להכין את מחשב ההרצה”.

1. **Run Experiment –**

This is the codes’ flow:



* 1. In experiment.m define ‘SUB\_NUM’, then run first section and then ‘Run experiment’ section.
  2. When running the experiment, the code randomly chooses (without replacement) one trial list out of ‘RUN\_ME/stimuli/trials\_lists/’ folder. These trial lists dictate the order of stimuli in the experiment.
  3. Calibrate screen – When prompted to do so:
     1. “Use old touch plane calibration?” select “No”



* + 1. Touch the 3D tracking marker to the bottom left corner of the screen and hold it there, Press ‘OK’.
    2. If the screen resolution in the prompt is incorrect (should be 1920X1080):



exit the experiment and correct it in ‘touch\_plane\_setup.m’ wherever it says ‘defaultanswer=’.

* + 1. Repeat step 3 for each corner of the screen

1. **Examine output data –**

Use ‘Code\_output\_explanation.xlsx’ as a guide.

## Previous problems

1. Creating a new font – MATLAB only reads the first line of font names. Use [online font editor](http://www.glyphrstudio.com/online/) to create a font and give a one liner name.
2. Cropped letters – Tall letters are cropped. Avoid using them or make a them shorter with an [online font editor.](http://www.glyphrstudio.com/online/)
3. Mask are created with a white background – MATLAB saves jpg with a white background for optimal printing contrast. Solution:

Set(gcf, ‘color’, [0.5,0.5,0.5])

Set(gcf, ‘InvertHardcopy’, ‘off’)

1. Masks are streched – Happens when the saved figure doesn’t cover the entire screen. Solution:

Set(gcf, ‘WindowState’, ‘fullscreen’, ‘MenuBar’,’None’)

1. Stimuli timing problems – Reduce code logic, reduce amount of opened textures, change WaitSecs to Screen(‘Flip’,when).