# Anna Jafarpour - **Raymond Story**

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*Total runtime* 25-30 mins, depending on the response time.

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# Overview

* The study has 4 parts
  1. Listening to a story and imagining what is going on as the story progresses (no response) [8 min]
  2. Listening to the same story and segmenting it into events (tap on microphone for response) [8 min]
     + Some people will segment coarsely and some will segment more often. It is up to the participant to segment based on what they think is a start of a new event.
  3. Listening to probed sentences and recalling of what happened right after the probe verbally (response with speech) [depending on RT ~8 min]
     + People may recall the next sentence or some sentences ahead (next event), which ever they remember.
  4. Listening to a new story and notifying when they hear “Raymond” (tap on microphone for response). [3 min]
* On screen instruction (MATLAB Command Window) is available for the experimenter
* The experimenter will navigate through the experiment as the participants progresses in the task using the keyboard.

# Setup

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **OS** | **Software** | **Toolbox** | **Photodiode** | **Speaker** | **Microphone** |
| Linux | MATLAB | Psychotoolbox |  | yes | yes |

A copy of speaker (sound out) and microphone (sound in) should be recorded with the neural data.

1. Psychtoolbox on MATLAB for experiment presentation – the presentation is auditory (in and out) only and is controlled through the MATLAB Command Window. There will be no extra behavioral file. All the behavior (sound in) will be recorded with the neural data. Please see a recommended recording setup as follow:
2. Sound in: Microphone to record verbal response with neural data, sampling rate
   1. For example, for the Neuralynx system, if not already set up, use a configuration based on these values in the configuration file:

-SetInputRange "MicIn1" 10000

-SetDspLowCutFilterEnabled "MicIn1" True

-SetDspLowCutFrequency "MicIn1" 0.1

-SetDspLowCutNumberTaps "MicIn1" 0

-SetDspHighCutFilterEnabled "MicIn1" True

-SetDspHighCutFrequency "MicIn1" 8000

-SetDspHighCutNumberTaps "MicIn1" 256

-SetSubSamplingInterleave "MicIn1" 1

-SetInputInverted "MicIn1" False

1. Sound out: Speakers for listening to the auditory stimuli. A copy of sound out should be recorded with neural data using a splitter.
   1. For example, in the Neuralynx system, if not already set up, use a configuration based on these values in the configuration file:

-SetInputRange "MicOut1" 10000

-SetDspLowCutFilterEnabled "MicOut1" True

-SetDspLowCutFrequency "MicOut1" 0.1

-SetDspLowCutNumberTaps "MicOut1" 0

-SetDspHighCutFilterEnabled "MicOut1" True

-SetDspHighCutFrequency "MicOut1" 8000

-SetDspHighCutNumberTaps "MicOut1" 256

-SetSubSamplingInterleave "MicOut1" 1

-SetInputInverted "MicOut1" False

1. Keyboard for the experimenter to navigate through the task.
2. Please check that you can see non-saturated and clear input and output sounds in the recording system.

Hint: also check the range in the isolation box in the Neuralynx system for adjustment.

# Procedure

The experiment consists of 4 sections:

1. listening to a story,
2. segmentation of the same story (seg) with a follow up question,
3. 40 questions about the story (quest),
4. and target detection (Raymond).

* Note that there will be no MATLAB output file. All the responses will be recorded by the microphone concurrently with the neural data.

The MATLAB function **Anna\_RaymondStory**(story,seg,quest,raymond)runs the experiment.

This function can be called in the command window with inputs indicating which parts of the experiment you specifically want to run. 1 for running the section and 0 for not running.

For example:

* Anna\_RaymondStory, Anna\_RaymondStory(), or Anna\_RaymondStory(1,1,1,1)run the whole experiment.
* Anna\_RaymondStory(0,1,1,1) skips the story section and runs the rest of the sections. This is helpful if the experiment is terminated before it is finished.
* Anna\_RaymondStory(0,0,N,1) skips the story and segmentation sections and starts the question section from question number N. You can figure out the last question’s number from the output of the command window.

# Experiment flow

1. Please ask the participant’s company to kindly be quite and not interfere.
2. Ask the patient to tap on the microphone and check if you can see the signal clearly in the recording system.
3. Run the experiment and read the instruction only. **Do not give additional guideline.** Participants understanding of events may be different from you. **Do not give feedback on their understanding.** If needed, repeat the instruction.
4. Running the experiment: the first output in the command line is the instruction for section 1, the story. Please read the instruction for the participant. If the participant understood the instruction, experimenter, please press any key to start the story (8 mins long).

\*\*\*\*\*\*\*\*\*\*\*\*\*\* >

INSTRUCTION: This experiment is about your understanding.

We will now listen to a story.

Listen to the story carefully and imagine that you are in the situation.

We will ask you some questions about the story later.

Let me know when you are ready to start (press any key to start).

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1. Pressing any key starts the story. The following instruction is for the experimenter. ‘Space’ or ‘Return’ (enter) keys will skip this part of the task to get to the next section. Pressing ‘q’ will quit the experiment.

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When the story finishes and you are ready to proceed (or to skip):

press space or return (enter).

(press q at any time to quit the experiment.)

< \*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. If you quiet, to run the experiment again, use inputs that matches where you want to pick up:

Anna\_RaymondStory(story,seg,quest,raymond);

where inputs are 0 (skip) or 1 (run)

for example: Anna\_RaymondStory(0,1,1,1); % starts from the segmentation part

1. The next section is for listening to ***exactly the same*** *story* again with segmentation instruction. Please read the instruction to the participant, and **do not give additional instructions about segmentation**. Press any key to start the story for the second time (8 mins long).

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INSTRUCTION: Listen to the story again and this time tap on the microphone,

whenever a new event starts. We want you to segment the story into episodes,

whenever you think a new event starts.(press any key to start)**.**

< \*\*\*\*\*\*\*\*\*\*\*\*\*\*

After the story starts the prompt is that

\*\*\*\*\*\*\*\*\*\*\*\*\*\* >

When the story finishes and you are ready to proceed (or to skip):

press space or return (enter).

(press q at any time to quit the experiment.)

<\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. There is then a follow up question about segmentation strategy. Please ask the question and record the verbal answer.

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AFTER SEGMENTATION: what was your understanding of a new event?

(please make sure that the response is recorded via the mic.)

(when the answer finished, press any key to continue.)

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1. The next section is questions. Please read the instruction in the command window.

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INSTRUCTION: We will hear sentences from the story.

Listen carefully and tell us what the following sentence/phrase was.

You may use your own words.

Please speak clearly to the microphone (press any key to start).

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After the answer to each sentence, press any key to get to the next sentence. Participants can use their own words.

1. The output of this section is in the following format:

\*\*\*\*\*\*\*\*\*\*\*\*\*\* >

Part : 3 [section number]

played: [sound file directiory] RaymondStory\q**2**.wav

Press space or return (enter) to proceed (or to skip).

press r at any time to repeat the question.

press q at any time to quit the experiment.

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The number following q in, \q2.wav, is the question number. This number can be used to skip the experiment to when it may be interrupted. For example the experiment that was interrupted during q25.wav can be restarted by runningAnna\_RaymondStory(0,0,25,1).

If the question was not heard, you can repeat it by pressing ‘r’ key.

1. The last section is a new story about Raymond. Please read the instruction from the command window.

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INSTRUCTION: Listen to a new short story and this time tap on the microphone,

whenever you hear the word "Raymond" (press any key to start).

< \*\*\*\*\*\*\*\*\*\*\*\*\*\*

Thanks! the end.

# Timing

|  |  |  |  |
| --- | --- | --- | --- |
| **Instruction** | **Practice** | **Blocks** | **Total** |
| 2 min (on the screen) | 0 | 4 | 30 mins |