Experiment HP-13: The Gaze Cue Paradigm

Equipment Required

PC or Mac Computer

IXTA, USB cable, IXTA power supply

EM-220 Event marker

Event Marker Setup

1. Locate the EM-220 event marker.
2. Plug the connector to the EM-220 event marker into the EM1 Channel input on the back of the IXTA.

Figure HP-13-S1: The IXTA with the EM-220 event marker.

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Experiment HP-13: The Gaze Cue Paradigm

NOTES:

1. The target letter is always "**H**".
2. The distractor letter is always "**W**".
3. The images will show a simplistic face with the eyes either facing to the:
   - left,
   - center, or
   - right
4. The subject will react ONLY upon finding the target letter "**H**", which will either be on the left or the right side of the face.
5. The subject has 2 seconds in which to respond to finding the target letter "**H**". If the target has not been found within that time period, there should be no reaction recorded.
6. The last image will always be blank.

Exercise 1: Reaction Time and Predictable Gaze Cues

Aim: To measure the reaction time of a subject to a predictable gaze cue.

Approximate Time: 15 minutes

Procedure

1. Read all instructions carefully before beginning to record.
2. Information for the subject:
   - Instruct the subject to sit in a chair and face the computer screen.
   - Watch the computer screen and look at the center of the image when it pops up.
   - Then quickly press the event marker when the image appears on the screen and the subject has located the target letter **"H**".

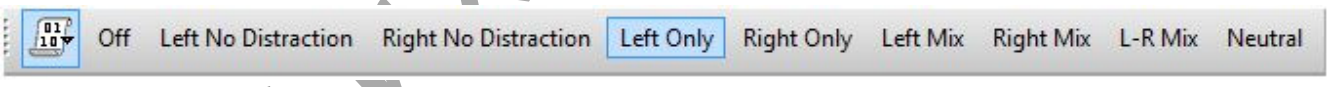

Figure HP-13-L1: The Macros.

Warning: In this exercise, it is important to press and release the button of the event marker as soon as the target letter "H" is located. Do NOT click the marker if you do not see the letter "H". (Figure HP-13-L2)

3. Type **"Left"** in the Mark box.
4. Click on the Record button. Click the mark button to mark the recording.

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5. Choose ***Left Only*** from the Macros list.
6. Instruct the subject to press the event marker as soon as (and only if) they locate the letter "H" on the image that appears.
7. Ten images will be shown.
8. After the tenth image, a blank will image will appear. Click Stop to halt recording.
9. Select Save As in the File menu, type a name for the file. Click on the Save button to save the data file.
10. Repeat the same procedures above, choosing ***Right Only*** from the Sequences list.
11. Click Save to save your data.

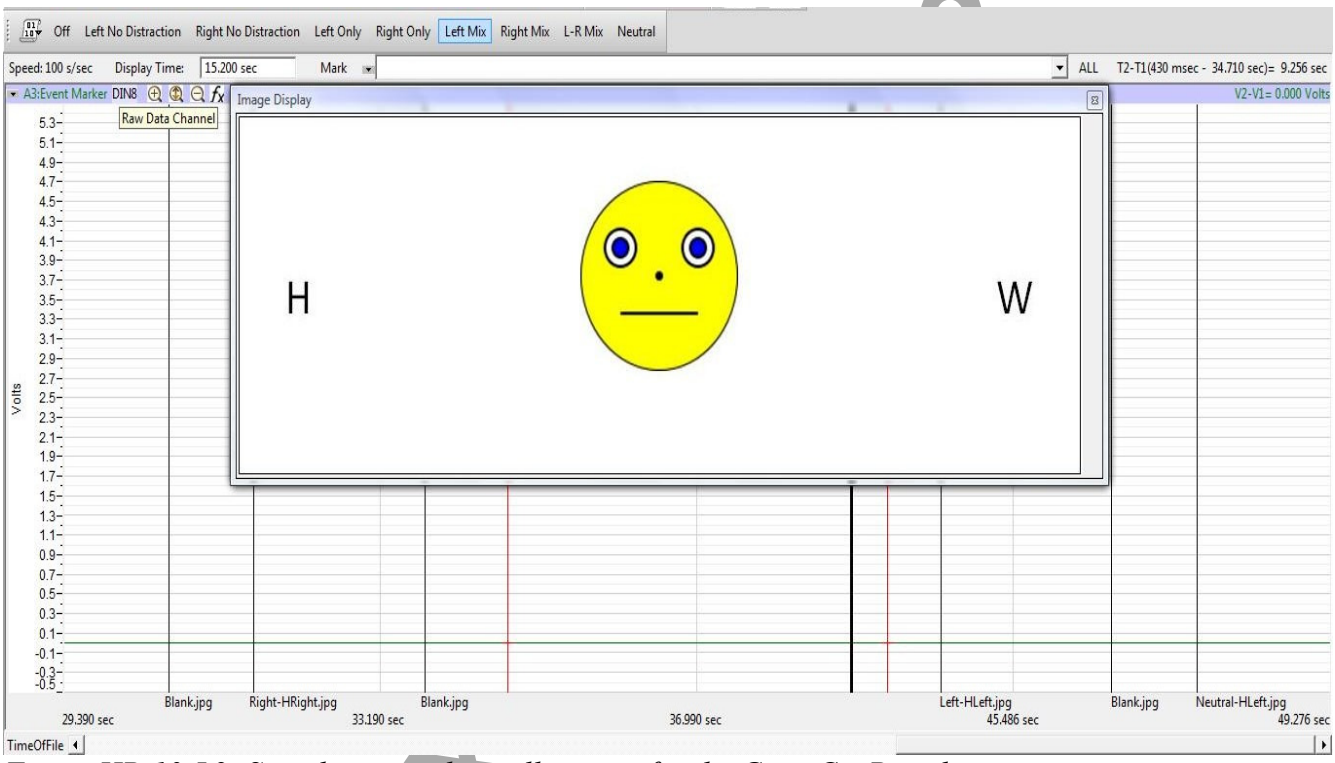

Figure HP-13-L2: Sample image that will appear for the Gaze-CueParadigm testing.

Data Analysis

1. Scroll to the beginning of the data recorded for Exercise 1 to display the first trial on the Main window.
2. Use the Display Time icons to adjust the Display Time of the Main window to show the entire recording when the ***Left Only*** sequence was running. This data can also be selected by:
   - Placing one cursor before the beginning of the first image cue and the second cursor after the mark made by the Blank image (mark will state: Blank); and

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- Clicking the Zoom between Cursors button on the LabScribe toolbar to expand the trials to the width of the Main window.

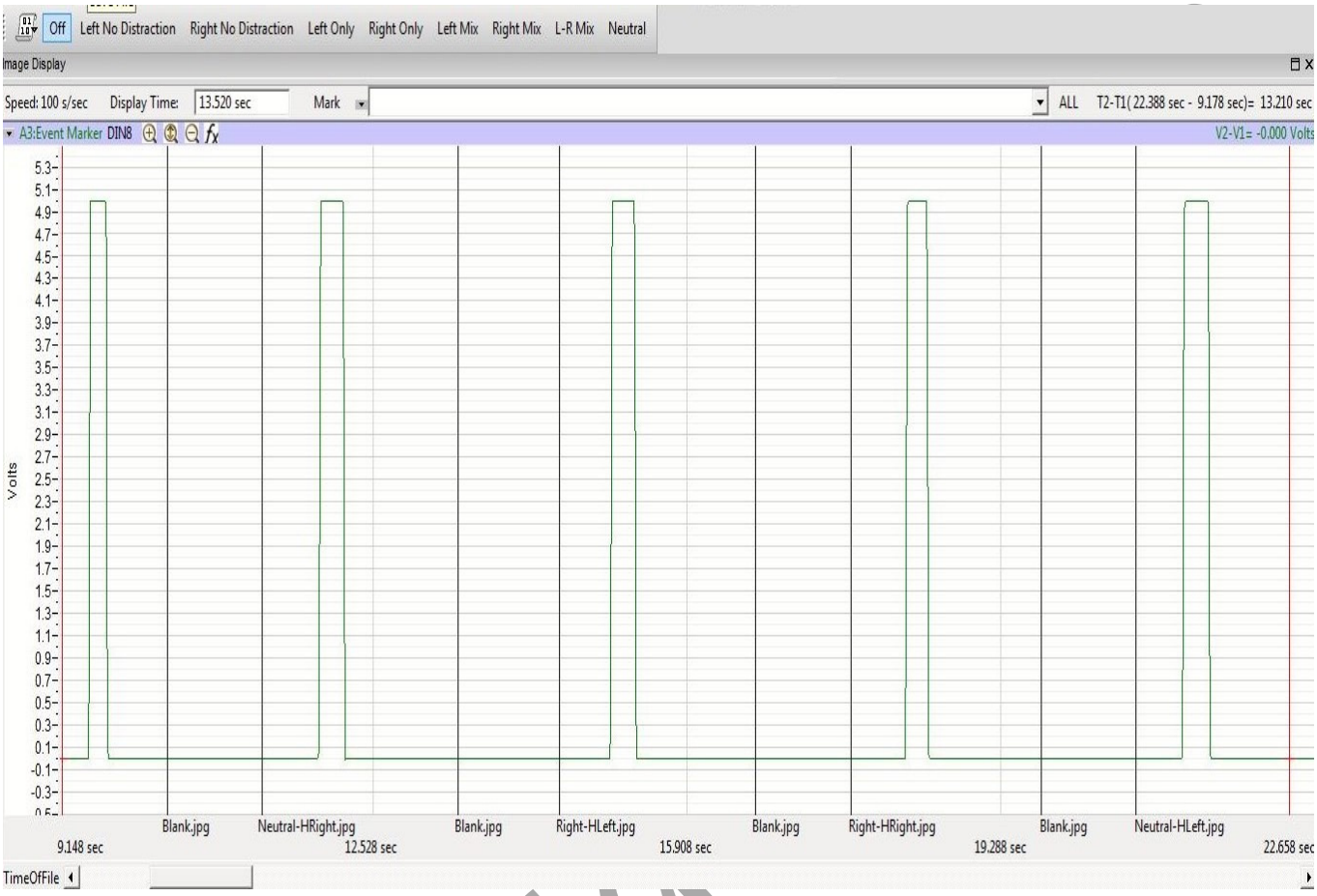

Figure HP-13-L3: Three visual cues, each followed by the subject's response, are displayed on the Main window. Each visual cue is made by pushing the button of the EM-100 event marker momentarily; each response mark is made by the subject pushing the F1 key on the keyboard.

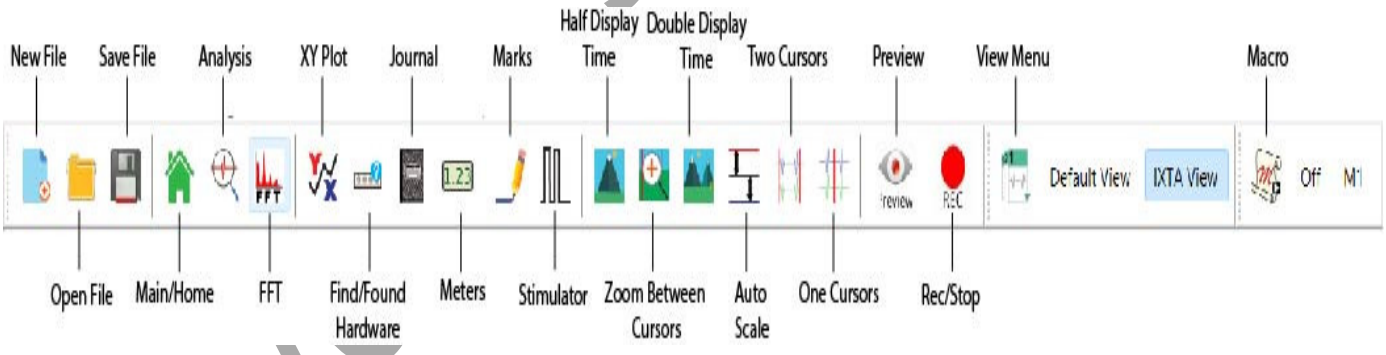

Figure HP-13-L4: The LabScribe toolbar.

3. Data can be collected from the Main window.

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4. The mathematical function T2-T1 should appear on screen. Value T2-T1 is located in the upper right corner of the Main window.
5. Use the mouse to click on and drag a cursor to the onset of the first image shown, this will be represented by a vertical black line with an annotation at the bottom. Drag the other cursor over to the beginning of the square wave made by the subject using the event marker as a response to finding the target letter.
6. Once the cursors are placed in the correct positions as stated above, record the value for T2-T1 in the Journal, for determining reaction time. The value can be recorded in the on-line notebook of LabScribe by typing its name and value directly into the Journal. You may also record any data on separate data tables.
7. Once the reaction time in the first trial is measured and recorded, continue to record the reaction times of the subject for the specific sequence being looked at.
8. Once the reaction times in all ten trials have been measured and recorded, open the Journal and use the values to determine the mean reaction time of the subject. Discard the longest and shortest times from the data set, and determine the average of the eight remaining reaction times. Record the mean reaction time for Left Only Sequence in Table 1.
9. Repeat Steps 2 through 8 on the data for the Right Only sequence.

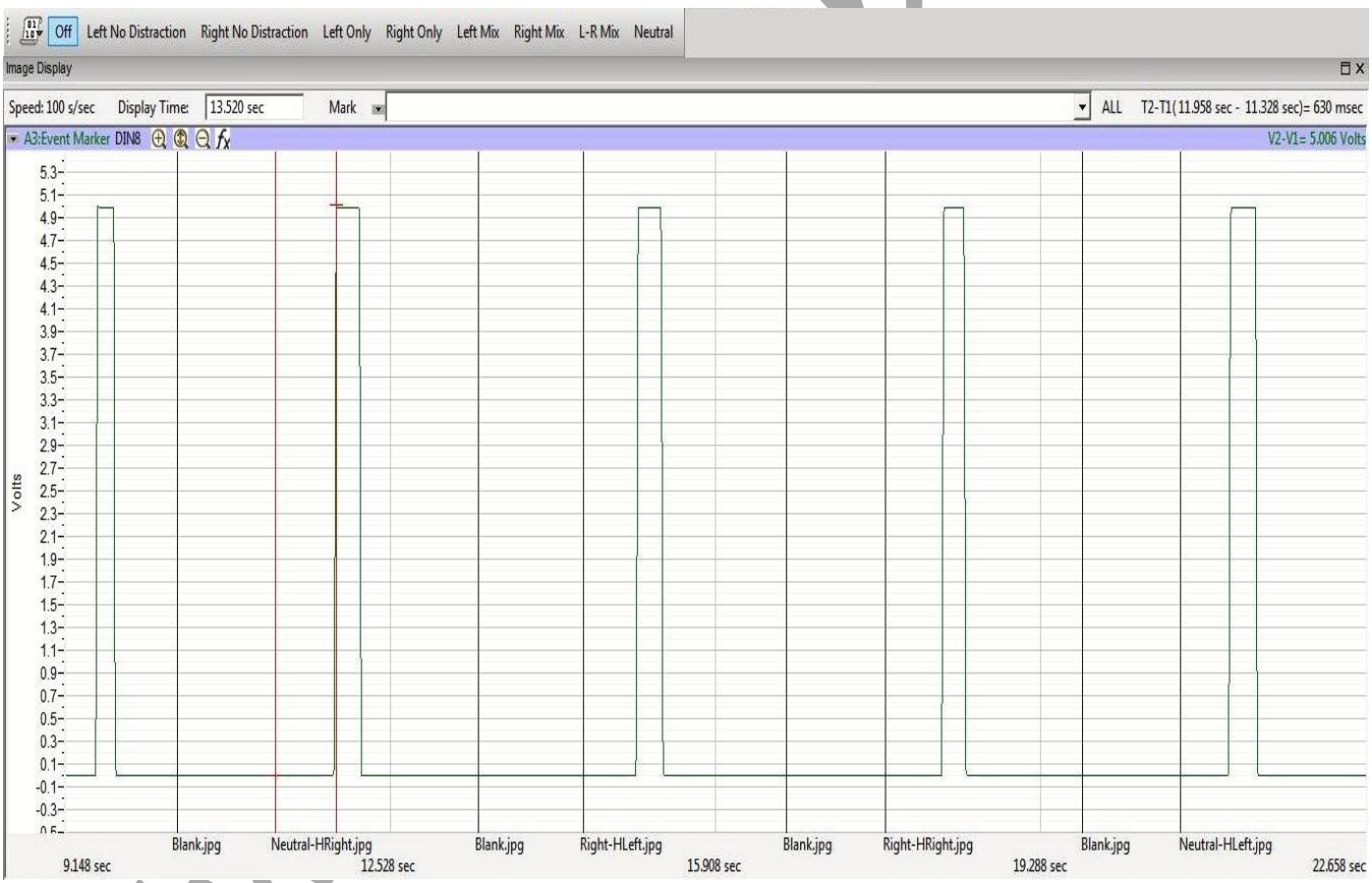

Figure HP-13-L5: Five visual cues, followed by the subject's responses with the two cursors are positioned at the beginning of the visual cue and on the mark for measuring the subject's reaction time.

Table HP-13-L1: Reaction Times for *Left Only* and *Right Only* Sequences

Eyes Left – H Left Time (msec)	Eyes Right – H Right Time (msec)

Exercise 2: Reaction Time and Gaze Cues with No Distractor

Aim: To measure the reaction time of a subject to an image cue that does not contain a distractor letter. Ten images will appear for the subject.

Approximate Time: 15 minutes

Procedure& Data Analysis

1. Follow the directions from Exercise 1, running the ***Left No Distraction*** sequence.
2. Click Save to save your data.
3. Repeat this experiment, running the ***Right No Distraction*** sequence.
4. Save your data.
5. Use the same technique explained in Exercise 1 to measure and record the reaction times of the subject presented with Gaze Cue images with no distractor letter.
6. Enter the mean reaction time for this exercise in Table 2.

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Table HP-13-L2: Reaction Times for *Left No Distraction* and *Right No Distraction* Sequences

Left No Distractor			Right No Distractor		
Eyes Left H Left (msec)	**Eyes Neutral H Left (msec)**	**Eyes Left H Right (msec)**	**Eyes Right H Right (msec)**	**Eyes Neutral H Right (msec)**	**Eyes Right H Left (msec)**

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Questions

1. How does the subject's mean reaction time to gaze cues when the eyes face left compare to their mean reaction time to gaze cues when the eyes face right?
2. What is the mean reaction time when the eyes are in the neutral position? Is there any difference between the neutral position with the "H" on the left or right? If so, which gives a faster reaction time?
3. What would cause a longer reaction time to one type of gaze cue as compared to another?

Exercise 3: Reaction Time and Gaze Cues with Distractors Present

Aim: To measure the reaction time of a subject to a gaze cue where a distractor letter "W" is present. Fifteen images will appear for the subject.

Approximate Time: 15 minutes

Procedure& Data Analysis

1. Follow the directions from Exercises 1 and 2, running the ***Left Mix*** sequence.
2. Click Save to save your data.
3. Repeat this experiment, running the ***Neutral*** sequence.
4. Save your data.
5. Repeat this experiment, running the ***Right Mix*** sequence.

6. Save your data.
7. Use the same technique explained in Exercise 1 to measure and record the reaction times of the subject presented with Gaze Cue images with a distractor letter.
8. Enter the mean reaction time for this exercise in Table 3.

Questions

1. To what set of gaze cues did your subject respond fastest? Slowest? Why?
2. Did the "Eyes Right-H Left" have a different reaction time than "Eyes Left – H Left"? Why?
3. Did the same hold true for "Eyes Right – H Right" and "Eyes Right – H Left"?
4. What does the position of the image's eyes have to do with reaction time?

Table HP-13-L3: Reaction Times to *Gaze Cues with Distractors* Present

Left Mix			Neutral		Right Mix		
Eyes Left H Left (msec)	**Eyes Ntrl H Left (msec)**	**Eyes Right H Left (msec)**	**Eyes Ntrl H Left (msec)**	**Eyes Ntrl H Right (msec)**	**Eyes Right H Right (msec)**	**Eyes Ntrl H Right (msec)**	**Eyes Left H Right (msec)**

Exercise 4: Reaction Time and Complex Mixed Gaze Cues

Aim: To measure the reaction time of a subject to a mix of gaze cues with no predictability. Twenty-five images will appear for the subject.

Approximate Time: 15 minutes

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Procedure& Data Analysis

1. Follow the directions from Exercises 1 and 2, running the ***L-R Mix*** sequence.
2. Click Save to save your data.
3. Use the same technique explained in Exercise 1 to measure and record the reaction times of the subject presented with Gaze Cue images with a distractor letter.
4. Enter the mean reaction time for this exercise in Table 4.

Questions

1. To which gaze cue did your subject respond most quickly?
2. To which gaze cue did your subject respond to most slowly? For what reasons?
3. Why do you think one gaze cue is generates a faster response than others?
4. Explain congruency and incongruency with respect to gaze cueing.
5. Did your subject respond more quickly or more slowly to same gaze cue as the other members of the class?

Table HP-13-L4: Reaction Times to *Left-Right Mix* of Complex Gaze Cues

Left-Right Mix of Gaze Cues with Distractors					
Eyes Left H Left (msec)	**Eyes Neutral H Left (msec)**	**Eyes Right H Right (msec)**	**Eyes Neutral H Right (msec)**	**Eyes Left H Right (msec)**	**Eyes Right H Left (msec)**

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Exercise 5: Hypothesis Testing

Create your own sequences using the images provided or import your own images.

Testing Possibilities: handedness (using 2 event markers); realistic vs. cartoon images; target seeking in complex images (like Finding Waldo); or create your own hypothesis.

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