Getting Started... Building a Mobile Match-To-Sample Task

Welcome to Paradigm! This tutorial will show you how to build a basic “Match-To-Sample” mobile experiment using Paradigm for Mobile. You can view a completed version of this task by opening the “Match To Sample Task” experiment in “/Documents/Paradigm Experiments/Paradigm Sample Experiments v2.5/Mobile Experiments/”

A. Create a New Experiment

1. Start Paradigm by clicking on the desktop icon.
2. Close the Paradigm startup screen.
3. Create a new experiment by clicking on New Experiment in the Experiment menu. In the new experiment dialog box select “Blank Experiment”, name it “Match to Sample Task” (without quotes) and click “Create”.
   
   **Note**: The “Mobile Experiment” option provides a template for creating mobile experiments but we are going to start from scratch for this tutorial. For future experiments we recommend you start with the “Mobile Experiment” template.
Mobile experiments are identical to desktop experiments with the following exceptions:

1. The experiment display resolution must be 1024x768.
2. Touch responses must be specified using the “Mouse” response device with “Detect Mouse Pointer Selection or Touch Response” enabled.
3. Images must be in either .bmp or .png formats.
4. Movies must be in .mp4 format.
5. Audio files must be .wav format
6. Mobile experiments can currently not contain Rating Scale, Self-paced Reading, Text Input, or Rich Text events.

**B. Add a Text Event to the Event Sequence to Present Participant Instructions**

1. Click on the **Design View** tab. The toolbox should now be visible on the left.
2. From the **Events** toolbox, drag a **Text** event into the Event Sequence (shown below).

**General Event Properties**

Clicking on an event will display its “General Properties” in the Property Grid (shown below). Rename this Text event **Instructions**. **All event names must be unique.**

1. The **Duration** property specifies how long the Instructions event will display its text. Specify **3000 ms**.
2. The **Clear Screen** property specifies whether the **Instructions** text should clear the screen after its duration has elapsed. Our instructions should disappear after the duration has elapsed, so set this property to **True**.
The Stimulus Designer
The Stimulus Designer allows you to layout how the Instruction event displays its text. Clicking on a text designer element will display its properties in the property grid (as shown below).

1. In the Instructions event, drag the text element towards the center of the stimulus designer and resize it by dragging one of the handles around its edge.
2. Click on the center of the text element, and type some instructions for the subject. You can format the text by clicking on the Text Font property in the property grid. The ideal font sizes for mobile experiments are 26 or 28 points.
3. Finally, make sure this text element is centered by selecting Center in the Alignment properties dropdown options.

Data Logging
An Event’s Data Logging properties allow you to specify the event and timing data that will be logged when the experiment is run. To view the loggable properties for the Instructions event:

1. Click on the Instructions event and then click on the Show Logging icon in the toolbar above the Property Grid (shown on the right). A list of loggable event properties will appear in the grid.

   **Tip:** While the property grid is in “Show Logging” mode you can view the logging properties of any event, stimulus designer element or response device by clicking on it.

2. To log a particular property check the checkbox in its Log column. For example, the OnsetTime property that will record the onset of this event in milliseconds.
C. Add a Block of Trials
Drag a **Block** event from the toolbox into the Event Sequence. Blocks are used to present a series of events multiple times (i.e., a block of trials). Blocks also contain a **Trial Table** that holds the data for each trial (e.g., stimulus names, correct responses, trial identifiers, etc...). This Block with present a series of Match-To-Sample trials.

D. Add a Multimedia Event to Block1 To Present the Sample Image
Drag a **Multimedia** event from the toolbox into Block1 and name it **Sample**. This will present the sample picture for each trial in the task. Here’s how your Event Sequence should look:

E. Add an Image Element to the Sample Event
At the start of each trial, the **Sample** event will present a single image placed towards the top of the screen. This is the image that the subject will have to match with one of three comparison images. The Sample event’s stimulus designer is currently blank so you will need to add an image element by clicking on the “Add image element” icon ( ) located above the property grid (shown below). Drag the image element to the top of the designer surface and resize it by dragging one of the white “handles” located around its edges. Rename this image element “SampleImage” (without the quotes). You can leave the **ImageLocation** property blank.

**Tip:** It is often difficult to see what the layout of visual elements will look like when the experiment is run. To fix this, Paradigm offers a **Full Screen Designer** view that will show you exactly how a subject will see the presented visual stimuli. To view the text elements in Full Screen, click on the icon located above the property grid. To exit out of the Full Screen Designer, press the Esc key.
F. Present A Unique Sample Image for Each Trial Using *Connections*

We want the image presented by the *Sample* event to change with every trial in this Block. As such, we’re going to want to add a set of unique stimuli file names to a column in Block1’s *Trial Table* and “connect” it to the SampleImage element’s *Image* property. In Paradigm, this is called creating a *Connection*. Connections allow you to change event, stimulus and response properties for each trial. Here’s how it’s done:

a. **Add a column to Block1’s Trial Table to specify the image file names for each trial**
   1. Make sure the *Sample* event is selected and then click on the *Trial Table View* tab.
   2. Add a new column by clicking on the button in the Trial Table toolbar. Name this new column *Sample*.
   3. Add four trials to the Trial Table by clicking on the button.
b. Create a Connection to enable presentation of a different Sample image for each trial
1. Click on the **Connections** tab.
2. **Drag and drop** the “Image” property under *SampleImage* from the **Connections** tab onto the **Sample** column (as shown below). You’ll see a green dot appear next to the “Image” property which means that you have successfully connected it to a column. The *SampleImage* element will now “look” in the **Sample** column to see which image stimulus to present for a given trial.

![Image showing Connections and SampleImage](image-url)

G. Add *Sample* Image Stimuli Using the Stimulus Finder

The **Stimulus Finder** lets you find stimuli (pictures, videos and sound files) on your computer and add them to a Trial Table. When you add a stimulus using the Stimulus Finder, Paradigm will automatically copy the stimulus file into your experiment’s folder. Here’s how to add image stimuli to a Trial Table:

**a. Locate stimuli files:**
1. Click on the **Stimulus Finder** tab.
2. Locate the **Match-To- Sample** images by clicking on the 📂 icon (a dialog will open).
3. Scroll down and click on the **Paradigm Experiments** folder and then click on the **Sample Experiments 2.0** folder. Next click on the **Mobile Sample Experiments**, then **Match To Sample Task** and then **Stimuli**. Click “OK”. The available stimuli files will be displayed in the list box.

**b. Add stimuli to your experiment:**
1. Click on the first cell in the **Sample** column in the Trial Table.
2. Click on the *alarm clock.bmp* filename in the Stimulus Finder.
3. Click on Add Stimulus in the Stimulus Finder.
4. You should see *alarm clock.bmp* appear in the selected cell. This file has now been added to your experiment.
5. **Add bandaid.bmp, baseball.bmp, beach chair.bmp and brake.bmp** to the trial table by repeating steps 1-3.
Finally, since we want to randomly present our stimuli, select _Randomized_ from the _Selection_ combo box in the Trial Table toolbar. Here’s what your Trial Table should look like:

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**H. Add a Touch Response to the Sample Event**

We want the _Sample_ event to wait until the subject touches the image before the experiment presents the Match stimuli comparisons. To do that, we will add a touch response to the _Sample_ event. Here’s how:

1. In _Design View_, click on the _Responses Devices_ category in the Toolbox.
2. Make sure the _Sample_ event is selected and then drag and drop a _Mouse_ device into the _Responses_ area under the property grid. A dialog will open (shown below).
3. Check _Left Button_ under _Allowable Responses_.
4. Check the _Detect Mouse Pointer Selection or Touch Response_ checkbox. This will tell the event to expect a touch response.
The Sample event is now complete. You will use the exact same series of steps to create the Match event but you will specify three more image elements on the designer surface and a correct response for the Mouse device so that Paradigm can score the subject’s response.

I. Add the Match Event to Block 1

In the Design View drag another Multimedia event into Block 1 behind the Sample event as shown here:

![Diagram showing the Match event added to Block 1](image_url)

The Match event will show the Sample event image and three comparison choices which the subject will select with a touch response.

a. Add Four Image Elements to the Designer Surface

1. Add four Image elements to the designer surface by clicking on the “Add Image Icon” ( 
 ![Add Image Icon](image_url) in the property grid toolbar four times.
2. Arrange the four image elements as shown below.

![Image Elements on Designer Surface](image_url)

3. Rename the topmost image element “SampleImage” and the bottom three image elements “Comparison1”, “Comparison2” and “Comparison3” respectively (all without quotes).
4. Click on SampleImage and set its Clickable property to “False” in the property grid. This will prevent subjects from being able to accidentally respond by touching the sample image. We only want to enable touch responses for the three comparison image elements.
b. Create a Connection for each image element to display a unique set of comparisons for each trial
Now that we have laid out the visual stimuli for the *Match* event we are going to specify the image stimuli to be presented for each trial. *Match* is going to re-present the image presented by *Sample* and then three comparison images. We already have a column with the images for *Sample* so we just need to add three more columns to hold the image names for the comparison images.

1. Click on *Match* and then click on the *Trial Table* view tab.
2. Add three columns to the trial table. Name them Comparison1, Comparisons2 and Comparison3 respectively.
3. Being that we want to re-present the Sample image we are going to create a connection to the existing “Sample” column. Click on the *Connections* tab and drag and drop the “Image” property of SampleImage onto the “Sample” column.
4. Drag and drop the “Image” property of Comparison1, Comparison2 and Comparison3 image elements onto their corresponding table columns.
5. Add stimuli file names to each of the three columns using the *Stimulus Finder* as you did with the *Sample* event.

Here is how your Trial Table and Connections properties should look:

![Trial Table and Connections Properties]

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c. Create a Correct Response Connection to enable response scoring
In the *Design View*, add a Mouse response to the *Match* event. As you did in Sample, check off “Left Button” for *Allowable Responses* and select *Detect Mouse Pointer Selection or Touch Response*. The other properties can be left as their defaults. For this event we want to score the subject’s response. To do this we are going to need to create a Connection to the Mouse devices “CorrectResponses” property and specify the correct image element name in a Trial Table column.

Here’s how:

1. Make sure the *Match* event is selected and the Trial Table is in view.
2. Click on the *Connections* tab.
3. Add a column to the Trial Table called *CorrectResps*. 
4. From the **Connections** tab, drag and drop the Mouse’s **CorrectResponses** property onto the **CorrectResps** column.

5. In the CorrectResps column, enter the correct name of the Image Element (Comparison1, Comparison2 or Comparison3) for the corresponding stimulus in the **Sample** column.

Here’s what your **Trial Table** should look like:

![Image of Trial Table](image)

**J. Add a Pause Event to put some space between trials**

Add a Pause event to the end the Block1. Rename it **Pause**, and set its **Duration** to 1000 milliseconds. This completes Block1.

![Image of Pause Event](image)

**L. Run the Experiment**

Let’s run what we’ve built so far just to make sure everything is working as expected. Click the **play** button on the toolbar. Enter subject and session information and go through the experiment. When the experiment is finished, you’ll see the dialog below:

![Image of Experiment Complete dialog](image)
Click **Save and View Results** to view the collected response and timing data. Paradigm has saved the data to an Excel spreadsheet as shown below:

![Excel spreadsheet showing collected data](image)

The collected data contains timing information for each event (OnsetTime, OnsetError) along with response data (Response Time, Responses and IsResponseCorrect) collected by the Match event. Notice how your responses were automatically scored by Paradigm when you specify a correct response for each stimulus.

**Tip:** Paradigm features a “test mode” that allows you run through an experiment without having to respond. You can start an experiment in test mode by clicking on the icon in the toolbar. Now just sit back and relax and let Paradigm run through your experiment for you.

**K. Add a Send Results event to receive your subject results via e-mail**

Paradigm’s Send Results event allows you to securely send your Paradigm results files to an e-mail account. This feature is ideal for remote mobile studies or when collecting data from multiple devices in your lab. Add a Send Results event to the end of your experiment and specify an e-mail address (or addresses) in the event properties grid. You can also specify the subject line of the e-mail and whether or not to include the subject’s ID in the subject line. Your event sequence should now look like this:

![Event sequence with SendResults1 event](image)
L. Finishing Touches
That just about completes this experiment. As a finishing touch, you might want to add a final Text event to the Event Sequence thanking the subject. Your finished Event Sequence should look like this:

Now run through to completed experiment and make sure results are being logged as expected and that you have received your results via e-mail.

M. Add a Consent Form using Paradigm E-Consent™ (optional)

Paradigm’s E-Consent allows you to create and present electronic consent forms using Paradigm Mobile and Desktop. E-Consent consent forms are mailed to you via secure e-mail as a .pdf attachment. The agreed to consent statement, the participant’s name (desktop) or signature (mobile) and the date of consent will be appended to the consent form.
Creating a consent form:

1. In Paradigm, click on the "View experiment properties" button above the event sequence (shown below) and make sure the "Consent Form" tab is clicked.

2. Enter your consent form text. You can either type in the text directly or import your text from a Microsoft Word document by clicking on "Import Text...". You can also enter a consent statement into the “Consent Statement” textbox.

3. Specify an e-mail address in the “SendTo” property of the property grid. This is the e-mail address that the signed consent form will be sent to when a subject agrees to take part in your study. You can also specify the text that will appear in the subject line of the consent e-mail using the “Subject Text” property.

   ![Consent Form Screen](image1)

   ![Signature Screen](image2)

Paradigm will now display a consent screen followed by a signature screen at the beginning of each run of your experiment. For more details on using Paradigm E-Consent, consult the Paradigm help file under the “Building Experiments” help topic.

**Congratulations on building your first Paradigm experiment!**

N. Running Your Experiment with Paradigm for Mobile

Now that you have built and tested your experiment it’s ready to run on your mobile device.

1. Create a Dropbox Account to use with Paradigm for Mobile

Your experiments are made available to the *Paradigm for Mobile* app by connecting it to a designated experiments folder in your Dropbox. The app's Dropbox integration requires that you give out a Dropbox username and password to your participants. As such, you are probably not going to want to give out your personal Dropbox login so we recommend you [create a Dropbox account](#) just to use with *Paradigm for Mobile*. 
2. Install the Paradigm for Mobile App and connect it to your Dropbox
On your mobile device, go to the Paradigm Mobile App Store Page and install it. Start the app and log in to your Dropbox account, this will create an "Apps/Paradigm Mobile" folder in your Dropbox and link the app to it. You will upload your Match-To-Sample experiment to this folder.

3. Upload your experiment to Dropbox
On your desktop computer, log in into your Dropbox account and upload your Match-To-Sample experiment to the "Apps/Paradigm Mobile" Dropbox folder. If you are using the Dropbox web interface you will not be able to drag the entire experiment folder into your browser to upload it. Instead you will have to recreate the “Match To Sample Task” folder, “Stimuli” folder and “Subject Data” folder using the Dropbox interface (right-click->New Folder) and then drag your stimuli and .px file into their respective folders. Your experiment folder should look like this on Dropbox:
4. Run your experiment
On your mobile device click the "Refresh" button and make sure “Match to Sample Task” is listed. To run an experiment, select it from the list. After your experiment completes, the data will be e-mailed to the address you specified in the Send Results event in your experiment.

And that’s all there is to it. If you have any further questions please submit it using the “Ask us a Question” form on the Paradigm Support page (http://www.paradigmexperiments.com/Support/Ask.php). To learn more about Paradigm’s secure results e-mail system, go to the FAQ on the Support page.

We hope your study goes well!