# ASCR ECX Evaluation Toolkit

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# README for ETK 2 Alternative Forced Choice Module

## File List:

* ETK-2AFCQualtrics.html
* ETK-2AFCQualtrics.css
* ETK-2AFCQualtrics.js
* ETK-2AFCREADME.docx
* ETK-2AFCSurveyFlow.png
* Sample Baseline and Stimuli Images: value\*\*-00.png – value\*\*-04.png

## Overview

This module is intended to be run within a Qualtrics survey. Qualtrics survey software can be found at www.qualtrics.com.

The 2 Alternative Forced Choice method is a psychophysical technique to find a threshold or a change point. In this image-based implementation, a participant (study subject) is shown a series of pair-wise comparisons. There is an array of baseline images (typically the “correct” answer) and an array of stimuli images for each stimuli level (typically the level is the variable effect that is being tested). The baseline image for each comparison is randomly chosen from the array of possible baselines. Likewise, an array of stimuli level images is built by randomly selecting one of the possible images from each stimuli level. This stimuli image array is then randomized so that the order of comparisons is random. Likewise, each individual pair of images is shown randomly as A vs. B or B vs. A. The list of stimuli images should generally include one of the baseline images to get the 50% random chance start to the 2AFC curve. A generic study within Qualtrics might consist of:

1. An IRB consent block/question.
2. An introduction block/question to explain the task and how an image should be chosen out of the pair shown.
3. A study block with a 2AFC module question.
4. A demographic block containing any relevant demographic questions.

## Instructions for implementation of the 2 Alternative Forced Choice Module

There are three files that work together for the implementation, an HTML, a CSS and a JavaScript file. The CSS file is added in the Look and Feel part of the survey options. Choose the Advanced tab and click on Add Custom CSS. Cut and paste the CSS sheet as directed. The HTML and JS files are added in the individual question. Choose a Descriptive Text question type. Click on the question text and an HTML View tab will appear. Click on the HTML tab and insert the HTML file. The list of baseline and stimuli images will need to be updated as will the phrasing of the specific question under study. Lastly, to the left of the question is the settings icon. Click on the settings icon and choose Add JavaScript. The custom JavaScript code should be added there.

Detailed information on developing surveys and using the Qualtrics JavaScript API can be found on the Qualtrics website.

A set of example images is included. The example images vary in value (greyscale) from value=00 (black) to value=45. In this example, the baseline are the black images and the stimuli levels are the images with the varying values. Each level includes five variants. The variants have a different number on the image itself (00 to 04). A 2AFC test could be run to find the discrimination threshold for the value where people can see the difference between the black baseline and a non-zero value.

For each image pair, information on which choice was made corresponding to each of the stimuli images must be saved to embedded variables. The Qualtrics JavaScript API allows the user to write out information via the setEmbeddedData method. The embedded data variables MUST be created within the Survey Flow in order to save this information. An example Survey Flow screenshot in included. Each comparison is saved with the name of the stimuli image shown and the choice that is made: 1=baseline Image; 0=stimuli Image. By default, the names and choices are saved as “nX” and “cX”. If the user wishes to change those defaults, the JavaScript file must be edited so that the embedded data variable names match the ones created in the survey flow. More information on creating embedded data variables and the survey flow can be found on the Qualtrics website.

A Boolean variable, AllOneSide, is used as a check to make sure that participants are faithfully completing the task. If a user always chooses the left (or right) button, the AllOneSide flag is set to 1. This can be used in post-processing to remove potentially bad participants. Again, AllOneSide must be declared in the Survey Flow as an Embedded Variable (no preset value needed). Note that if AllOneSide is false, it is not written out by Qualtrics.

A timing variable, timeDelay, and flag, doTimeDelay, can be used to set a slight delay before each image appears. For images with high levels of similarity, this can make it easier for subjects to realize that there is a new set of images or prevent users from using jitter effects to find differences.

## Amazon Mechanical Turk

Amazon Mechanical Turk, <https://www.mturk.com/mturk/welcome>, is a crowdsourcing site that can provide a convenient source of study participants for online studies. A URL link to a Qualtrics study can be input into an Mturk HIT to launch a study. More information can be found on the Mechanical Turk website.

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