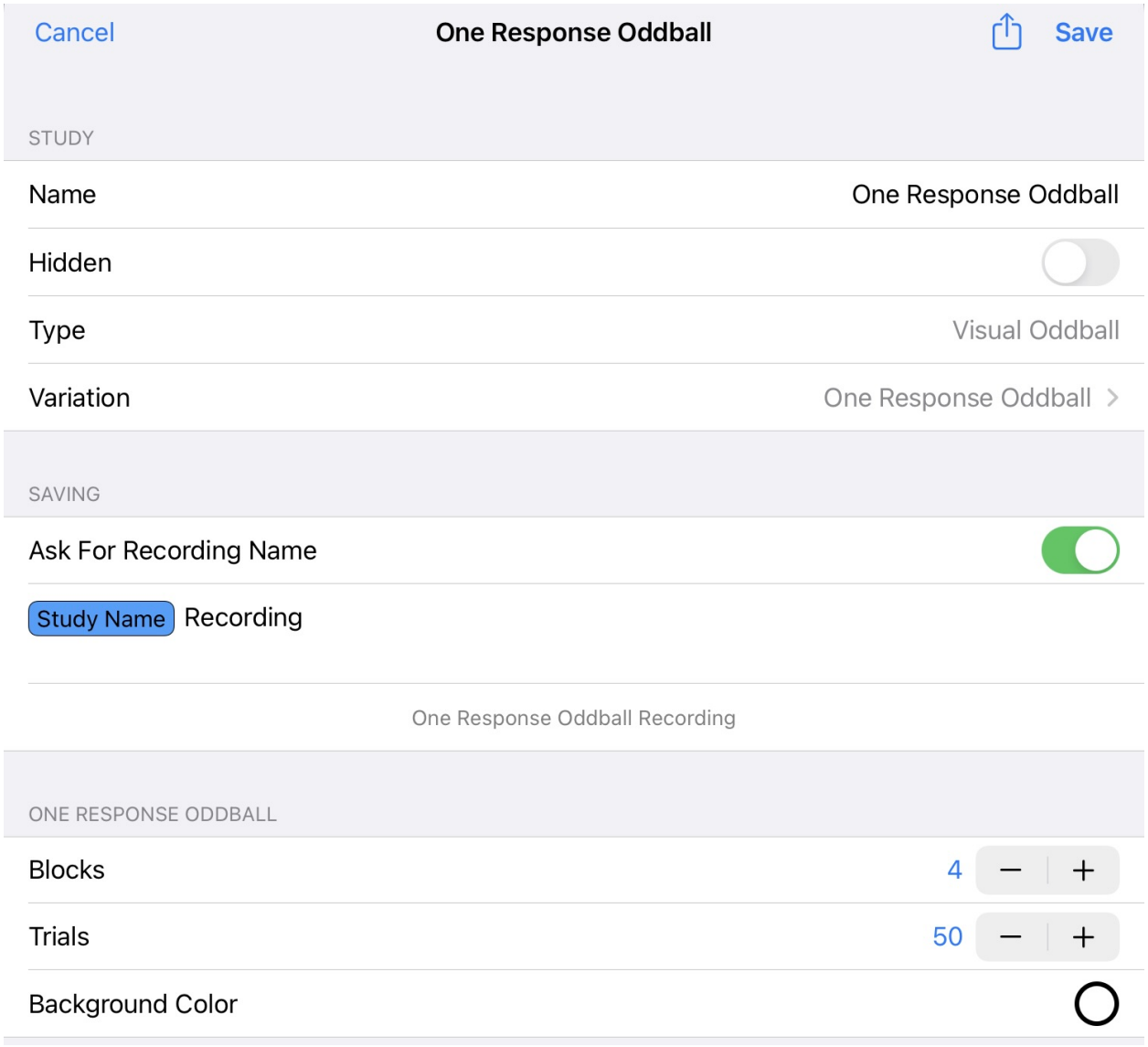
PEER

Settings and Configuration Manual

Table of Contents

Configuring Visual Oddball

The visual oddball game can be configured in a variety of ways to support your research needs.



In the top part of the configuration screen, you can do the following:

1. Specify a unique study name for each configuration - here we are simply calling it "One Response Oddball".

2. You can specify whether the same is hidden or not from the menu screen. Note, this does not delete the configuration, it just hides it.

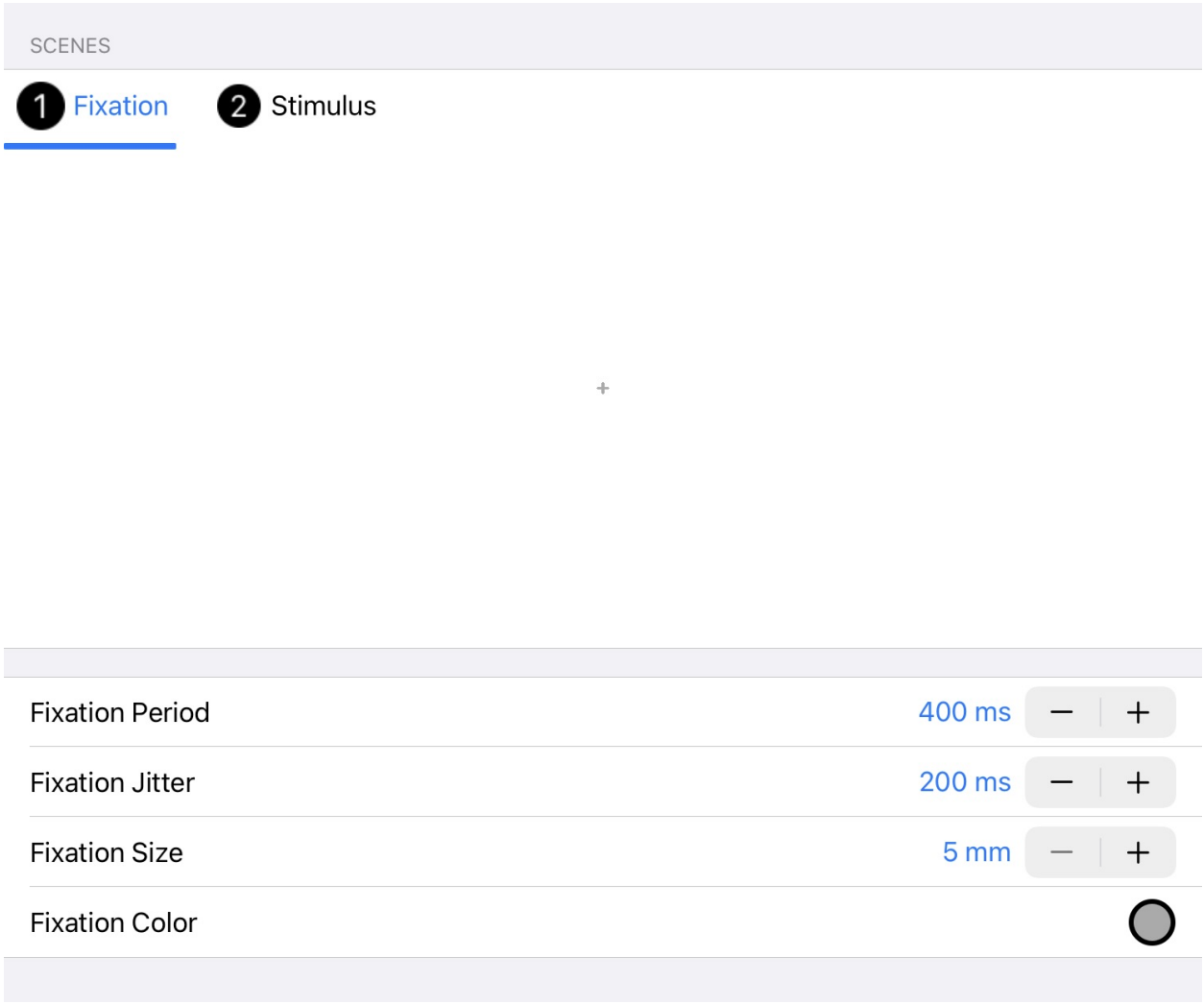
3. PEER will tell you the category of game you are playing - here it is Visual Oddball.

4. You can specify what variation of the game you want - PEER supports Passive Oddball, One Response Oddball, Two Response Oddball, and Go-NoGo as game options.

5. You can specify the recording name to be used at the end of the game.

6. You can specify the number of blocks of oddball to play and the number of trials within each block. We typically recommend 4 blocks of 50 trials to get a reasonable ERP response.

7. You can specify the background colour of the game.



As you scroll down, in the next part of the configuration screen, you can specify actual game properties. You will note this game has two game screens, each which you can customize separately.

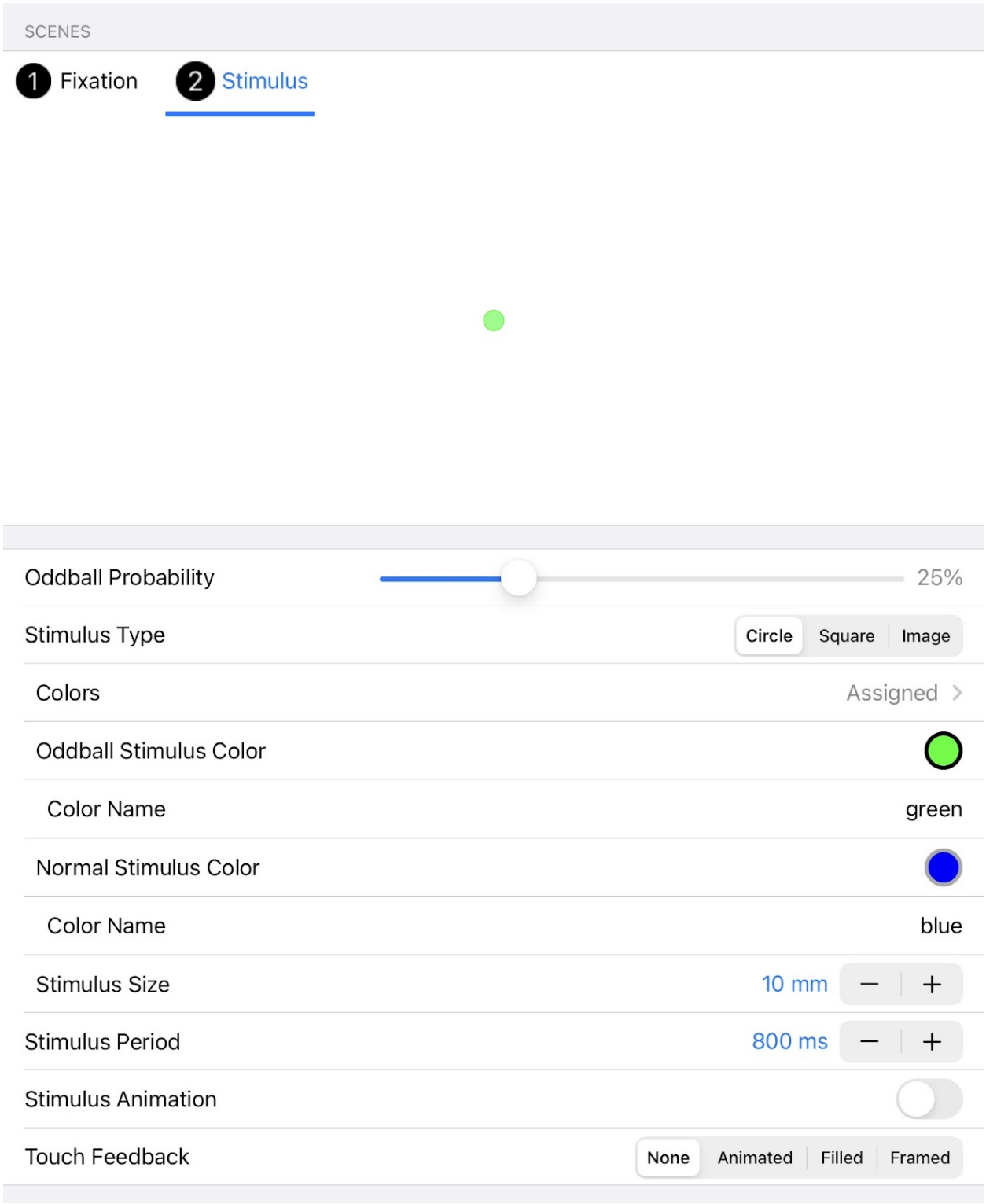
On the fixation screen you can specify:

1. The period of the fixation stimulus. Here we recommend 400 ms.

2. The amount of jitter to the fixation stimulus display period. Essentially, this means the fixation period time range here is 400 ms +/- 200 ms. This helps avoid anticipatory effects. We recommend 200 ms.

3. You can specify the size of the fixation stimulus in mm. Our recommended size depends on the size of the device you are using. 5mm is good for an iPad but might be too small for an iPhone.

4. You can specify the fixation colour. Note that high contrast can promote blinking which can be bad for ERP studies hence why we are recommending grey on a white background.



You can configure the stimulus display as well.

1. You can specify the oddball probability. With 200 total trials we recommend 25% but this is entirely up to you. Note, the amplitude of the oddball ERP response is impacted by this probability - lower probabilities mean a larger response but you may not have enough trials for an ERP analysis. Hence, why we recommend 25% with 200 trials which will give you a total of 50 oddball trials and 150 control trials, on average.

2. You can specify the stimulus type - a circle, a square, or an image you upload yourself.

3. You can specify whether or not the oddball colours are assigned or random. This essentially means that the oddball colours are the same for the whole game or random each block. Given that the game is quite brief, we recommend setting this to assigned.

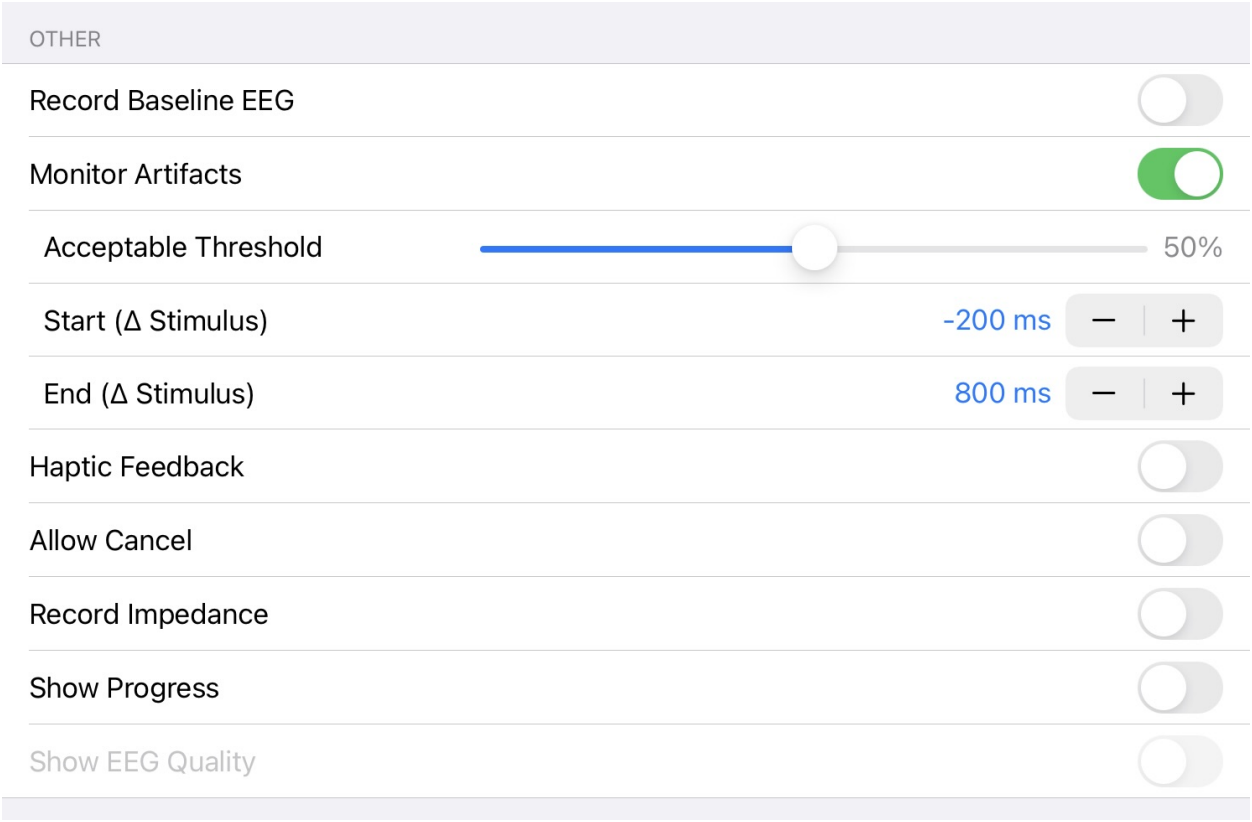
4. You can specify the colour of the oddball and control stimulus from a palette of colours.

5. You can specify the stimulus size in mm. Again, this is tied to the size of the screen. 10 mm works well on an iPad.

6. You can specify how long the stimuli are on the screen. We recommend 800 ms.

7. You can specify whether or not the stimulus is animated.

8. You can specify whether or not the user received touch feedback when they touch the screen on oddball trials.



Finally, as you scroll to the bottom of the configuration screen you can specify some additional PEER features.

1. You can specify whether or not PEER records a period of EEG data before the game starts.

2. You can specify whether or not PEER monitors artifacts for you. Essentially, if the signal is too noisy within a block of trials, PEER will redo that block of trials. In this case, if PEER judges you will lose more than 50% of the trial data - based on artifacts that occur from between 200 ms stimulus onset to 800 ms after stimulus offset, PEER will want to redo the block of trials.

3. You can specify whether or not PEER provides haptic feedback when you touch the screen.

4. You can specify whether or not there is a cancel button onscreen while the game is playing.

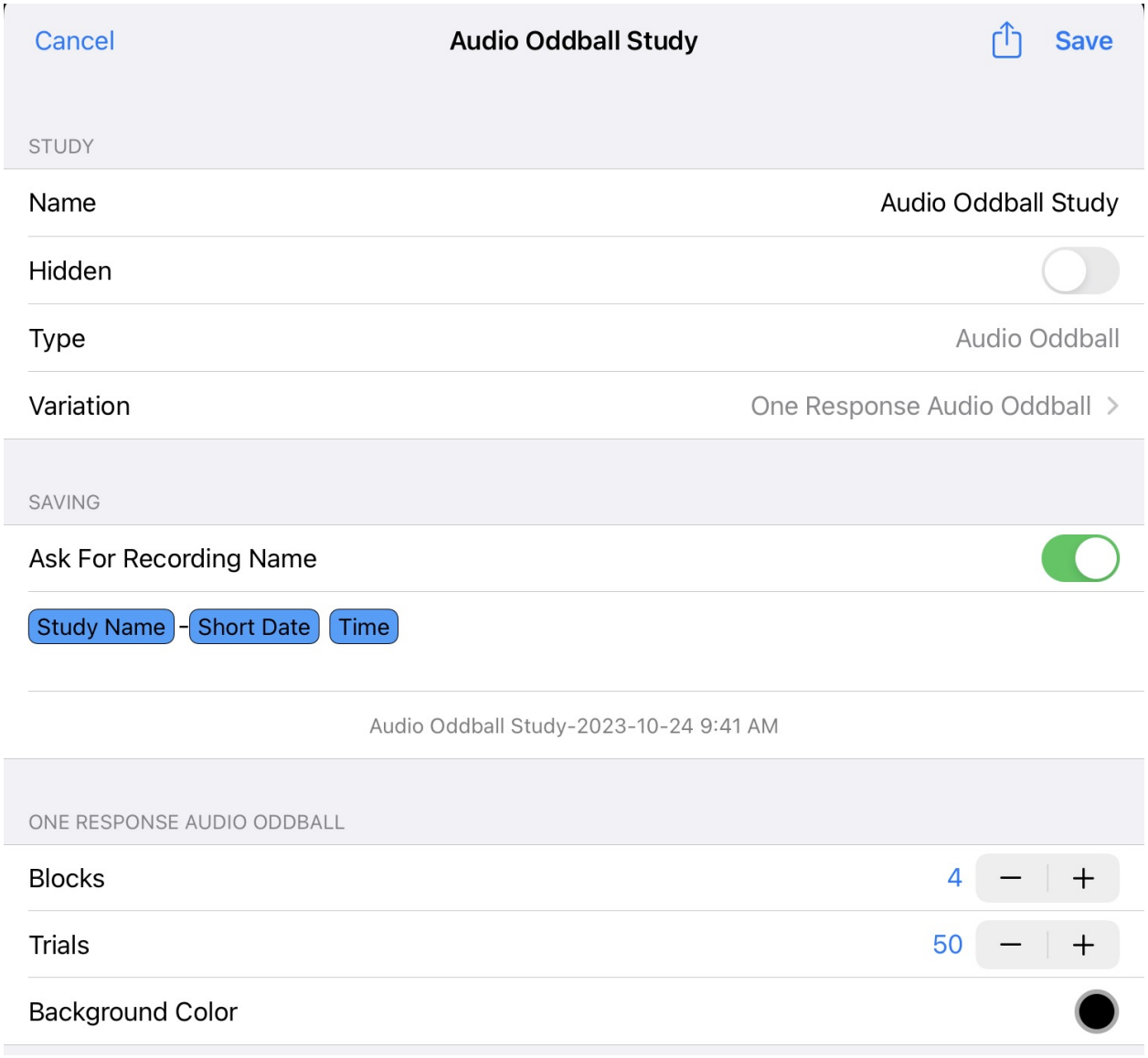
5. You can specify whether or not PEER records impedance values.

6. You can specify whether or not PEER shows a progress bar during the game.

7. You can specify whether or not PEER displays EEG quality in real time.

Configuring Auditory Oddball

The auditory oddball game can be configured in a variety of ways to support your research needs.



In the top part of the configuration screen, you can do the following:

1. Specify a unique study name for each configuration - here we are simply calling it "Audio Oddball Study".

2. You can specify whether the same is hidden or not from the menu screen. Note, this does not delete the configuration, it just hides it.

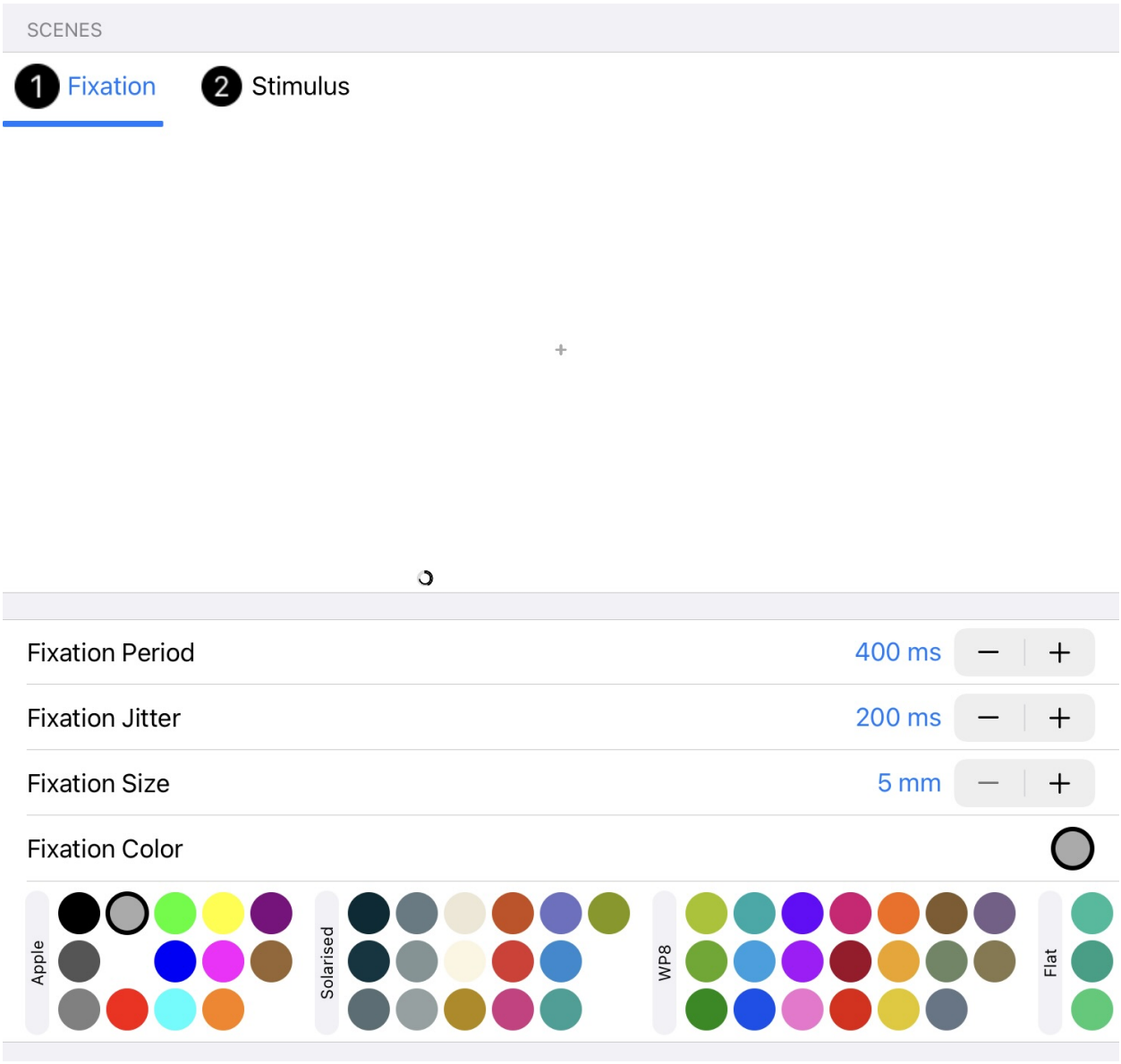
3. PEER will tell you the category of game you are playing - here it is Audio Oddball.

4. You can specify what variation of the game you want - PEER supports Passive Oddball, One Response Oddball, Two Response Oddball, and Go-NoGo as game options.

5. You can specify the recording name to be used at the end of the game.

6. You can specify the number of blocks of oddball to play and the number of trials within each block. We typically recommend 4 blocks of 50 trials to get a reasonable ERP response.

7. You can specify the background colour of the game.



As you scroll down, in the next part of the configuration screen, you can specify actual game properties. You will note this game has two game screens, each which you can customize separately.

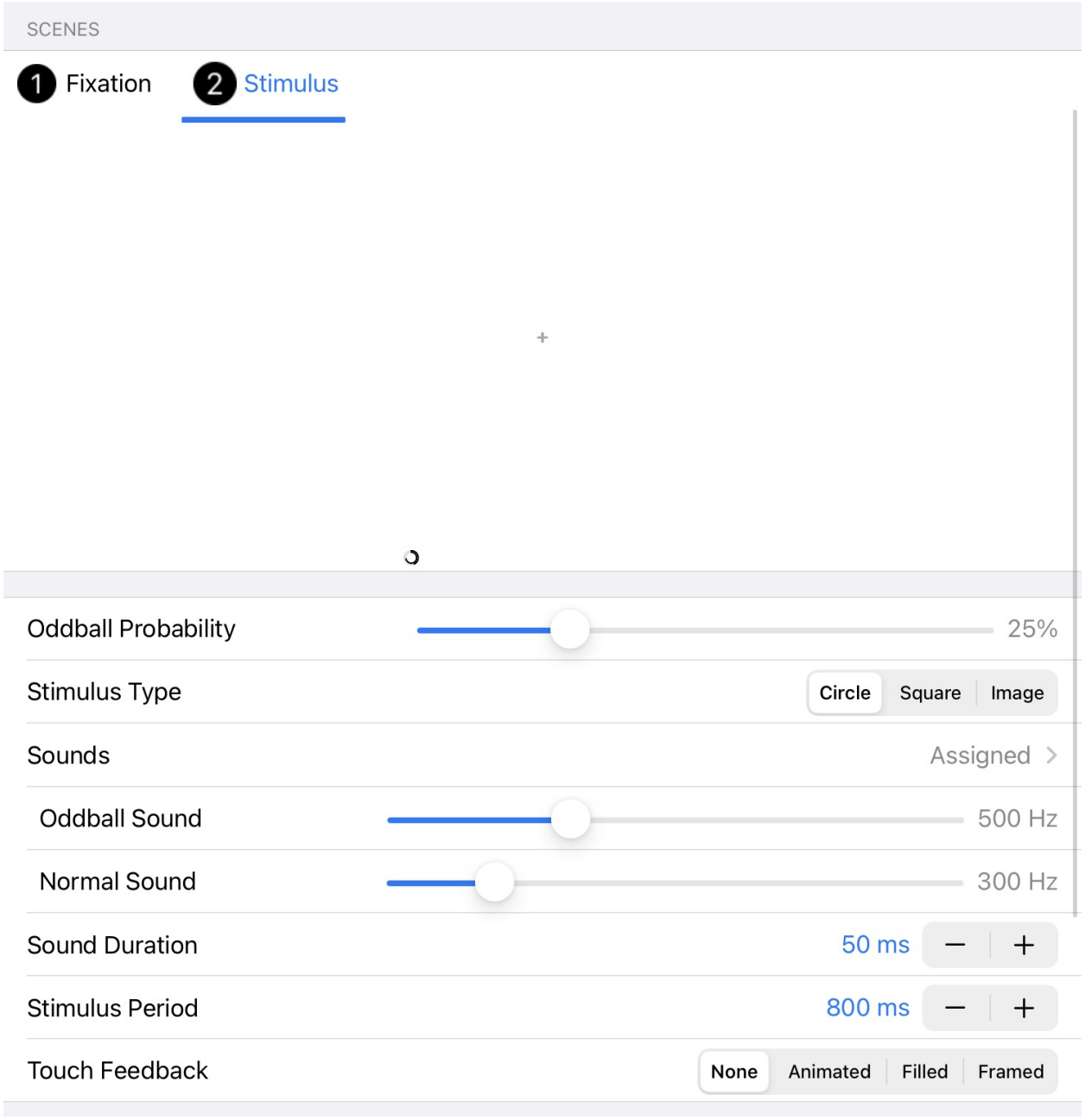
On the fixation screen you can specify:

1. The period of the fixation stimulus. Here we recommend 400 ms.

2. The amount of jitter to the fixation stimulus display period. Essentially, this means the fixation period time range here is 400 ms +/- 200 ms. This helps avoid anticipatory effects. We recommend 200 ms.

3. You can specify the size of the fixation stimulus in mm. Our recommended size depends on the size of the device you are using. 5mm is good for an iPad but might be too small for an iPhone.

4. You can specify the fixation colour. Note that high contrast can promote blinking which can be bad for ERP studies hence why we are recommending grey on a white background.



You can configure the stimulus setup as well.

1. You can specify the oddball probability. With 200 total trials we recommend 25% but this is entirely up to you. Note, the amplitude of the oddball ERP response is impacted by this probability - lower probabilities mean a larger response but you may not have enough trials for an ERP analysis. Hence, why we recommend 25% with 200 trials which will give you a total of 50 oddball trials and 150 control trials, on average.

2. You can specify the stimulus type - a circle, a square, or an image you upload yourself.

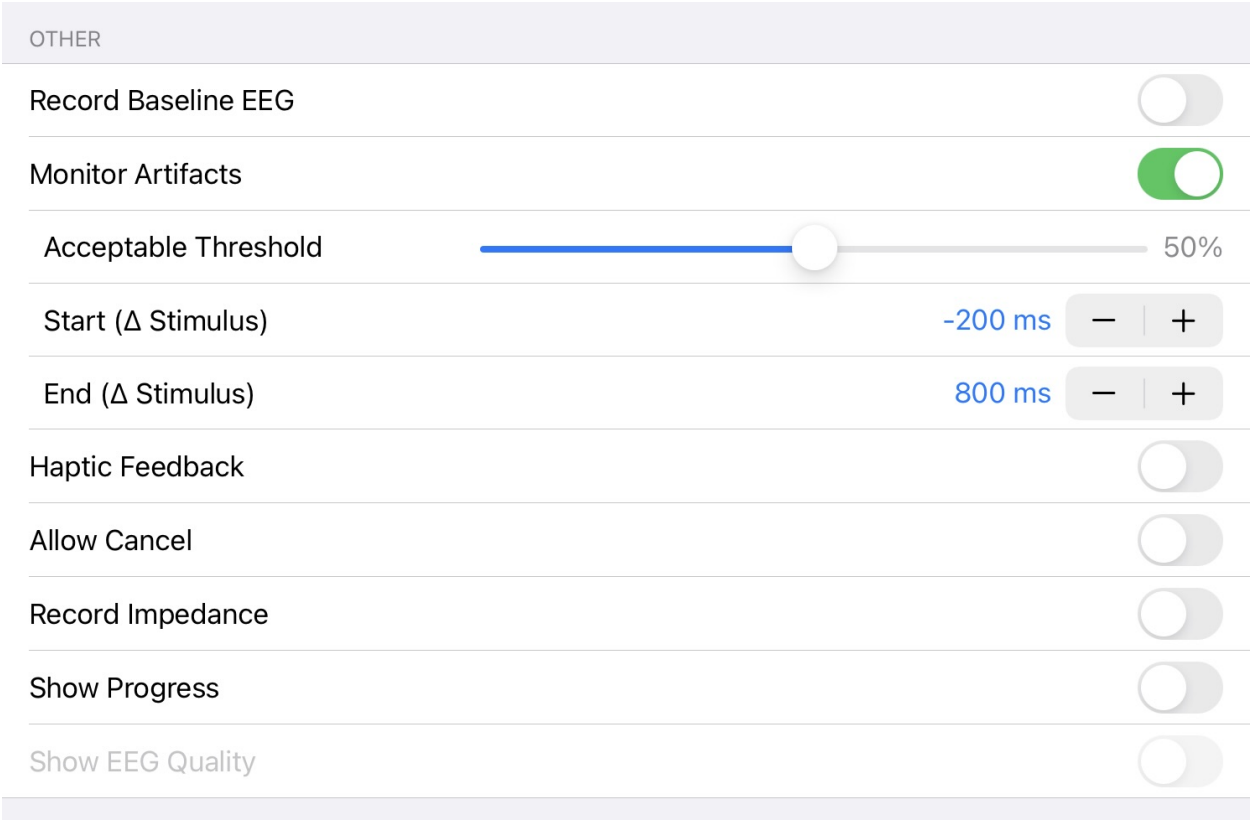
3. You can specify whether or not the oddball is assigned or random. This essentially means that the oddball is the same for the whole game or random each block. Given that the game is quite brief, we recommend setting this to assigned.

4. You can specify the frequency (in Hz) of the oddball and control audio stimulus.

5. You can specify the sound duration in ms. We recommend 50 ms.

6. You can specify how long the PEER waits after the audio stimulus is played. We recommend 800 ms.

7. You can specify whether or not the user received touch feedback when they touch the screen on oddball trials.



Finally, as you scroll to the bottom of the configuration screen you can specify some additional PEER features.

1. You can specify whether or not PEER records a period of EEG data before the game starts.

2. You can specify whether or not PEER monitors artifacts for you. Essentially, if the signal is too noisy within a block of trials, PEER will redo that block of trials. In this case, if PEER judges you will lose more than 50% of the trial data - based on artifacts that occur from between 200 ms stimulus onset to 800 ms after stimulus offset, PEER will want to redo the block of trials.

3. You can specify whether or not PEER provides haptic feedback when you touch the screen.

4. You can specify whether or not there is a cancel button onscreen while the game is playing.

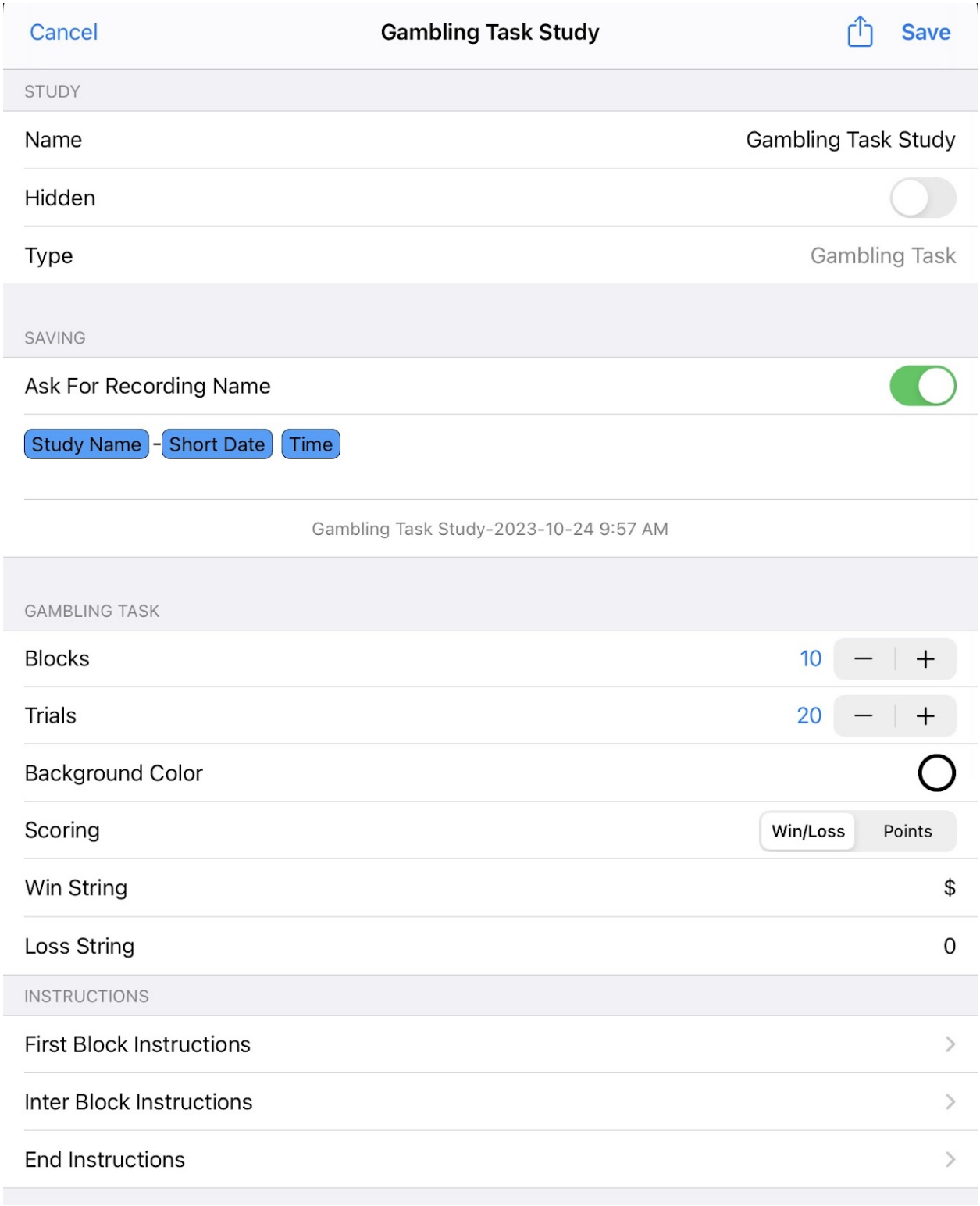
5. You can specify whether or not PEER records impedance values.

6. You can specify whether or not PEER shows a progress bar during the game.

7. You can specify whether or not PEER displays EEG quality in real time.

Configuring the Doors Gambling Task

The doors gambling task can be configured in a variety of ways to support your research needs.



In the top part of the configuration screen, you can do the following:

1. Specify a unique study name for each configuration - here we are simply calling it "Gambling Task Study".

2. You can specify whether the same is hidden or not from the menu screen. Note, this does not delete the configuration, it just hides it.

3. PEER will tell you the category of game you are playing - here it is Gambling Task - there is only one category of this game in PEER.

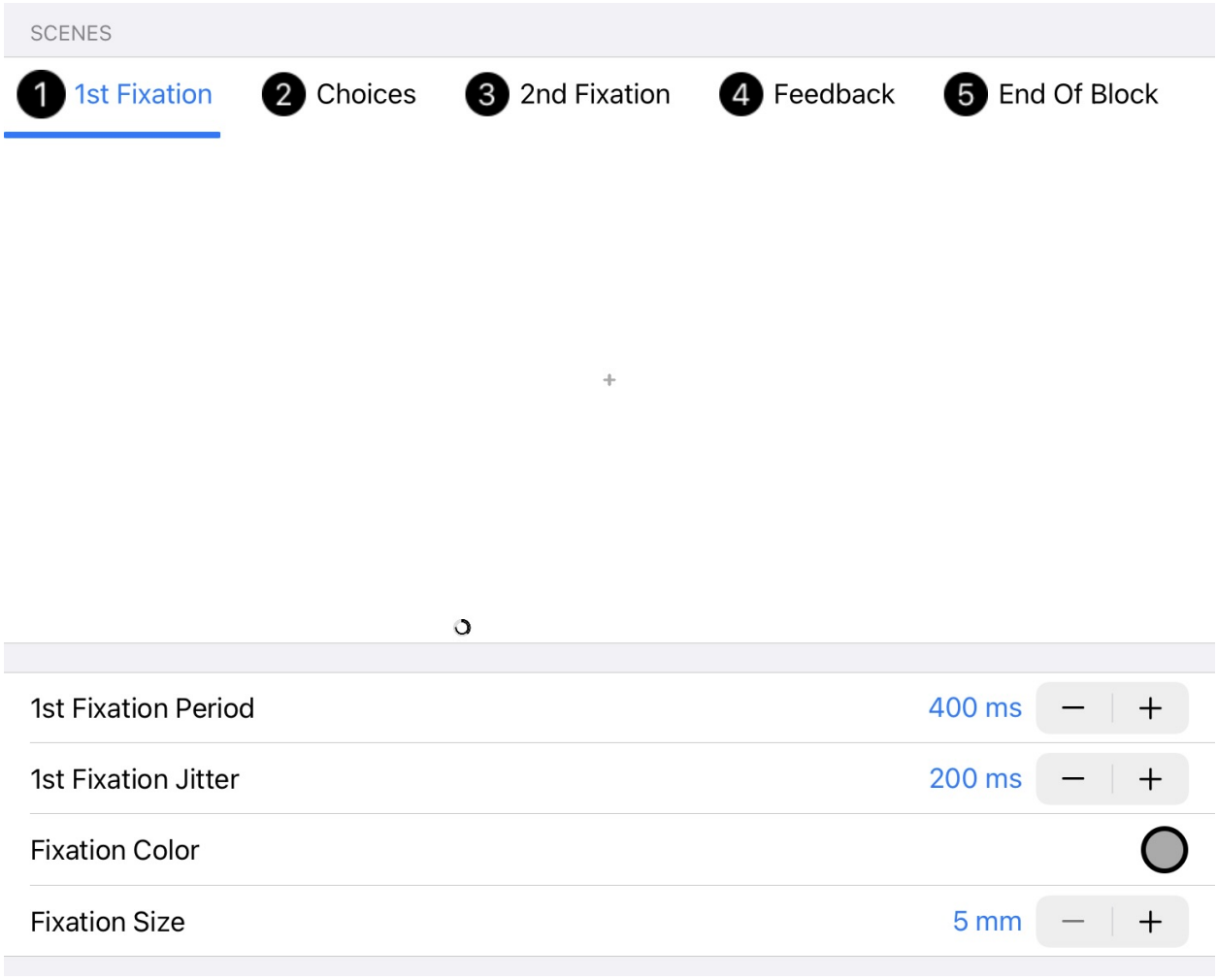
4. You can specify the recording name to be used at the end of the game.

5. You can specify the number of blocks of oddball to play and the number of trials within each block. We typically recommend 10 blocks of 20 trials to get a reasonable ERP response.

6. You can specify the background colour of the game. Here it is set to white.

7. You can specify whether the scoring each of the gambles is done as win/loss or with a number of points you specify.

8. You can specify what is shown for win and loss trials to the participant.



As you scroll down, in the next part of the configuration screen, you can specify actual game properties. You will note this game has two game screens, each which you can customize separately.

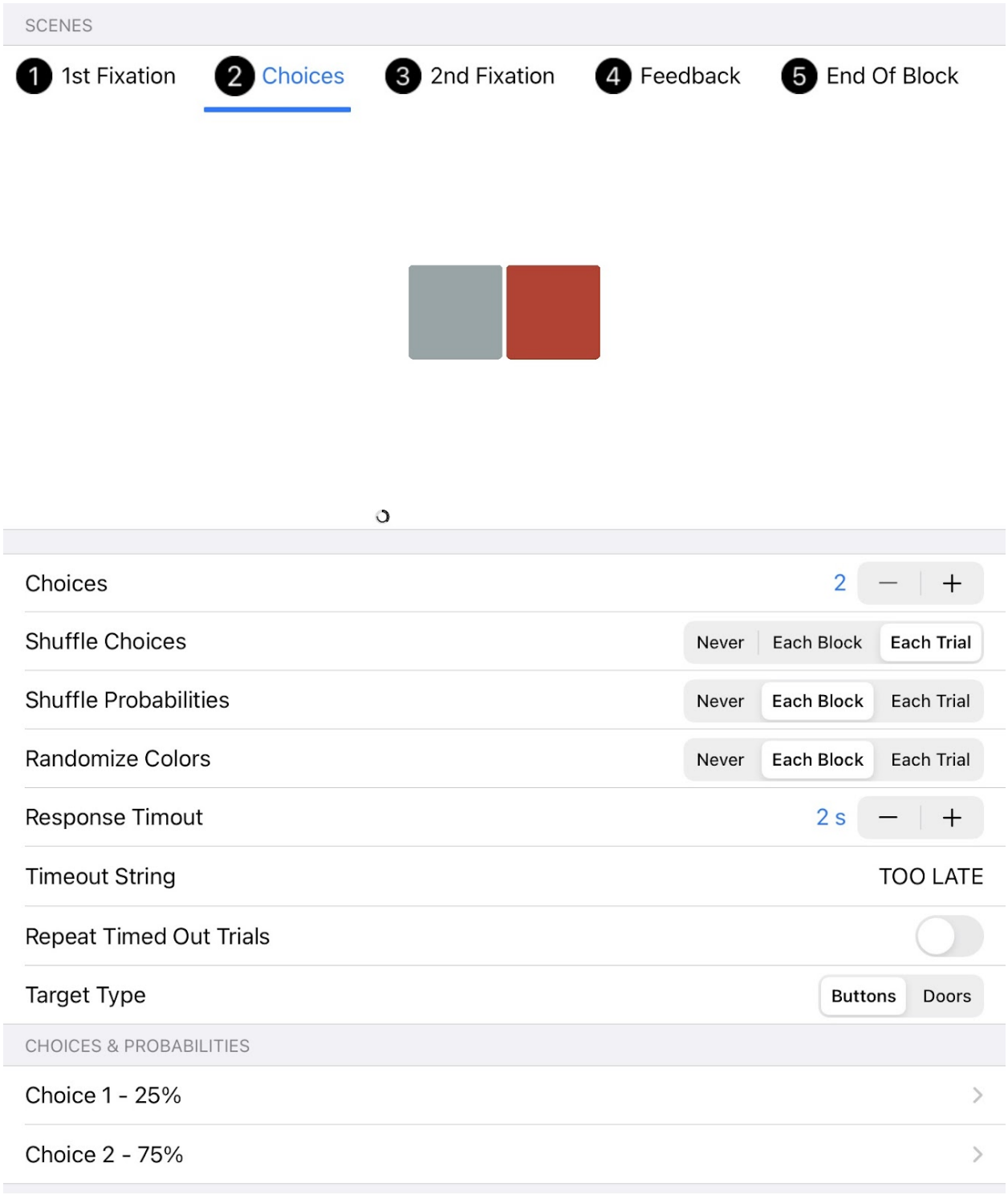
On the fixation screen you can specify:

1. The period of the fixation stimulus. Here we recommend 400 ms.

2. The amount of jitter to the fixation stimulus display period. Essentially, this means the fixation period time range here is 400 ms +/- 200 ms. This helps avoid anticipatory effects. We recommend 200 ms.

3. You can specify the size of the fixation stimulus in mm. Our recommended size depends on the size of the device you are using. 5mm is good for an iPad but might be too small for an iPhone.

4. You can specify the fixation colour. Note that high contrast can promote blinking which can be bad for ERP studies hence why we are recommending grey on a white background.



On the second game scene of the doors gambling task you can specify the mechanics of the gambles and the display.

1. You can specify how many gambling choices there on each trial. We recommend 2 but PEER supports up to 16.

2. You can specify how frequently the choices are shuffled. We recommend shuffling the location of the choice each trial.

3. You can specify how frequently the win/loss probabilities are shuffled. We recommend each block.

4. You can specify how often the stimulus colours are changed. We recommend each block.

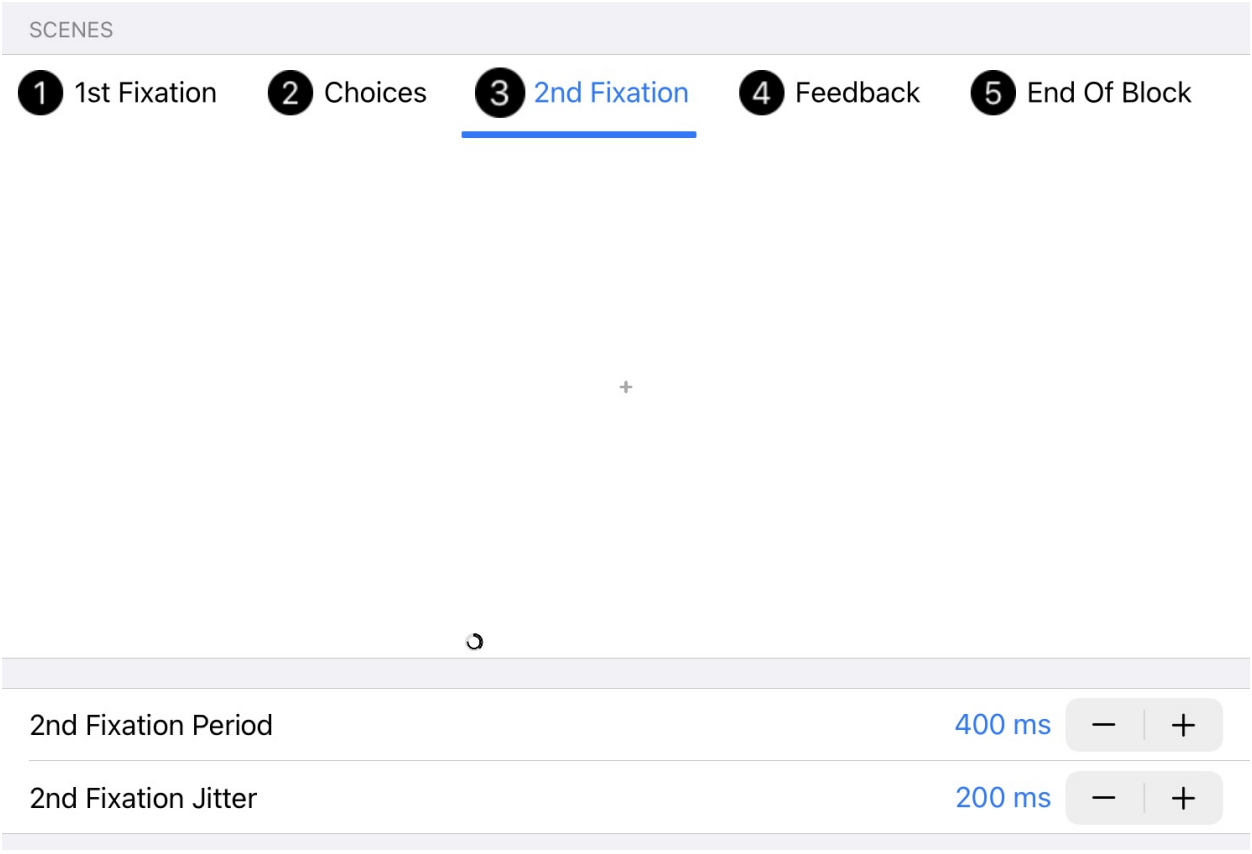
5. You can specify how long a user has to respond - we recommend 2 seconds.

6. You can specify a "time out" message to the user if they take took long.

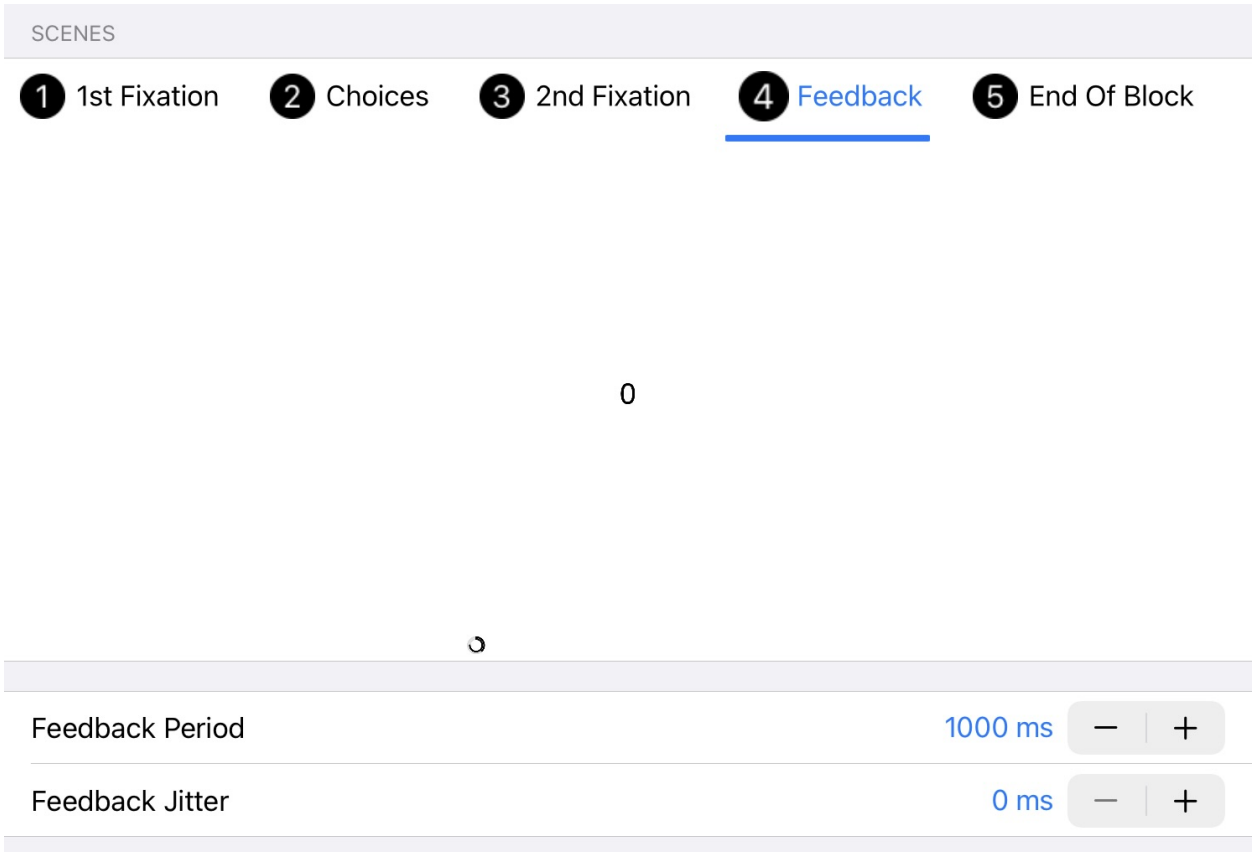
7. You can specify what to do with repeated trials - are they repeated or not.

8. You can specify the target type - whether you use buttons (squares) or actual doors.

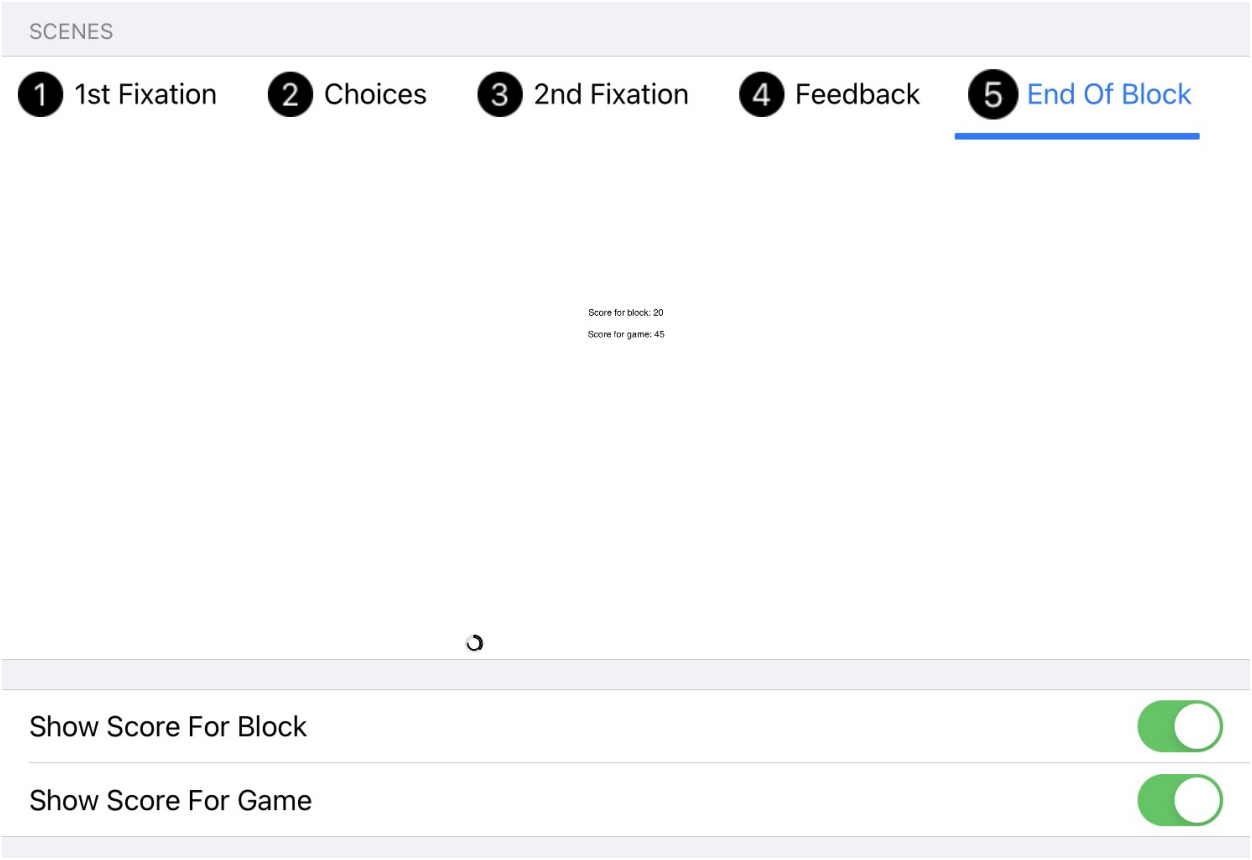
9. You can specify the will/loss probabilities for each choice. Here, choice one will win 25% of the time and choice two will win 75% of the time. We recommend these values.



After the user chooses a gamble, PEER will display another fixation screen. Here, we have set the fixation time properties to be the same as before which we recommend.



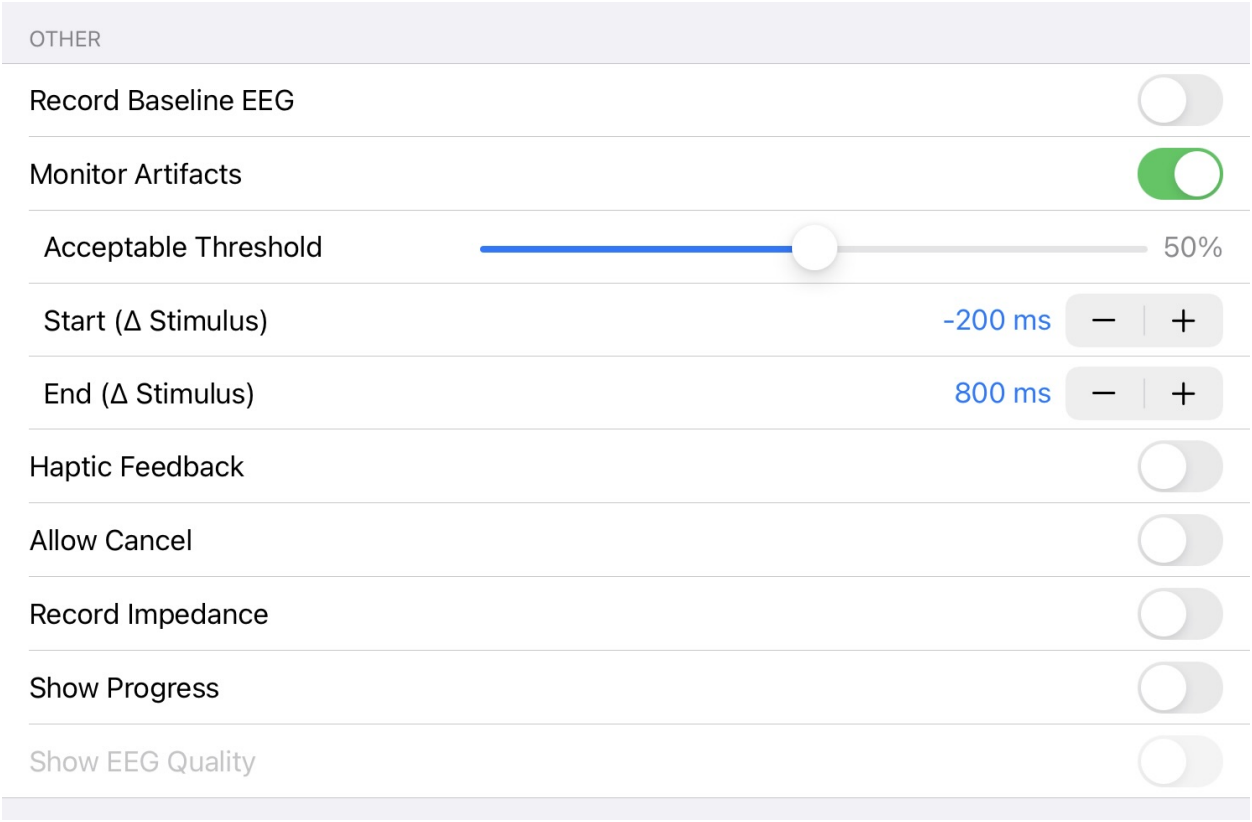
Next, PEER will display the outcome of the gamble. We recommend a feedback period of 1000 ms with no jitter.



PEER will then ask you about what you want to do at the end of each block.

1. Do you want to show participants their score for the block.

2. Do you want to show participants their total score for the game so far.



Finally, as you scroll to the bottom of the configuration screen you can specify some additional PEER features.

1. You can specify whether or not PEER records a period of EEG data before the game starts.

2. You can specify whether or not PEER monitors artifacts for you. Essentially, if the signal is too noisy within a block of trials, PEER will redo that block of trials. In this case, if PEER judges you will lose more than 50% of the trial data - based on artifacts that occur from between 200 ms stimulus onset to 800 ms after stimulus offset, PEER will want to redo the block of trials.

3. You can specify whether or not PEER provides haptic feedback when you touch the screen.

4. You can specify whether or not there is a cancel button onscreen while the game is playing.

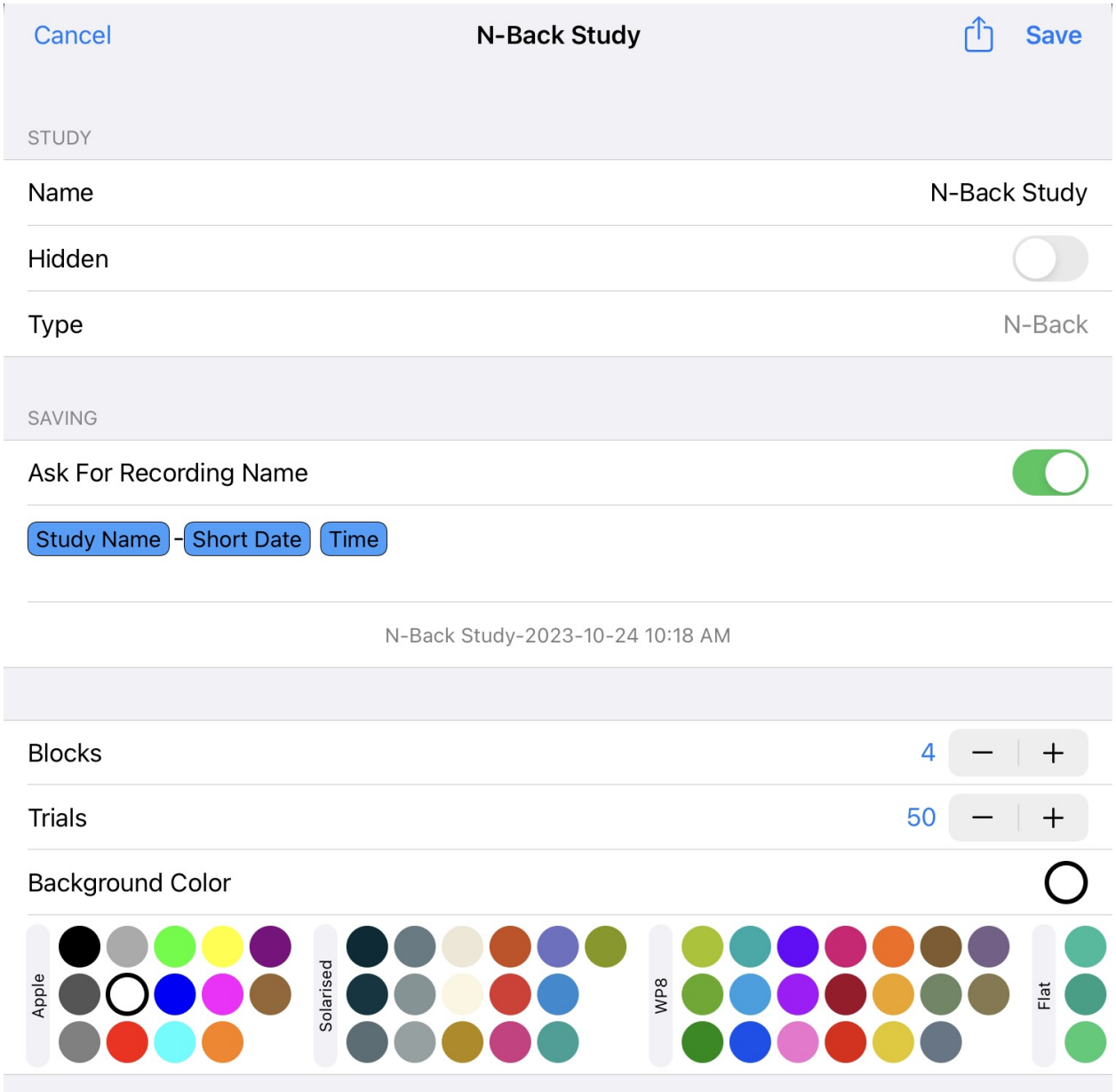
5. You can specify whether or not PEER records impedance values.

6. You can specify whether or not PEER shows a progress bar during the game.

7. You can specify whether or not PEER displays EEG quality in real time.

Configuring the nBack Task

The nBack game can be configured in a variety of ways to support your research needs.



In the top part of the configuration screen, you can do the following:

1. Specify a unique study name for each configuration - here we are simply calling it "N-Back Study".

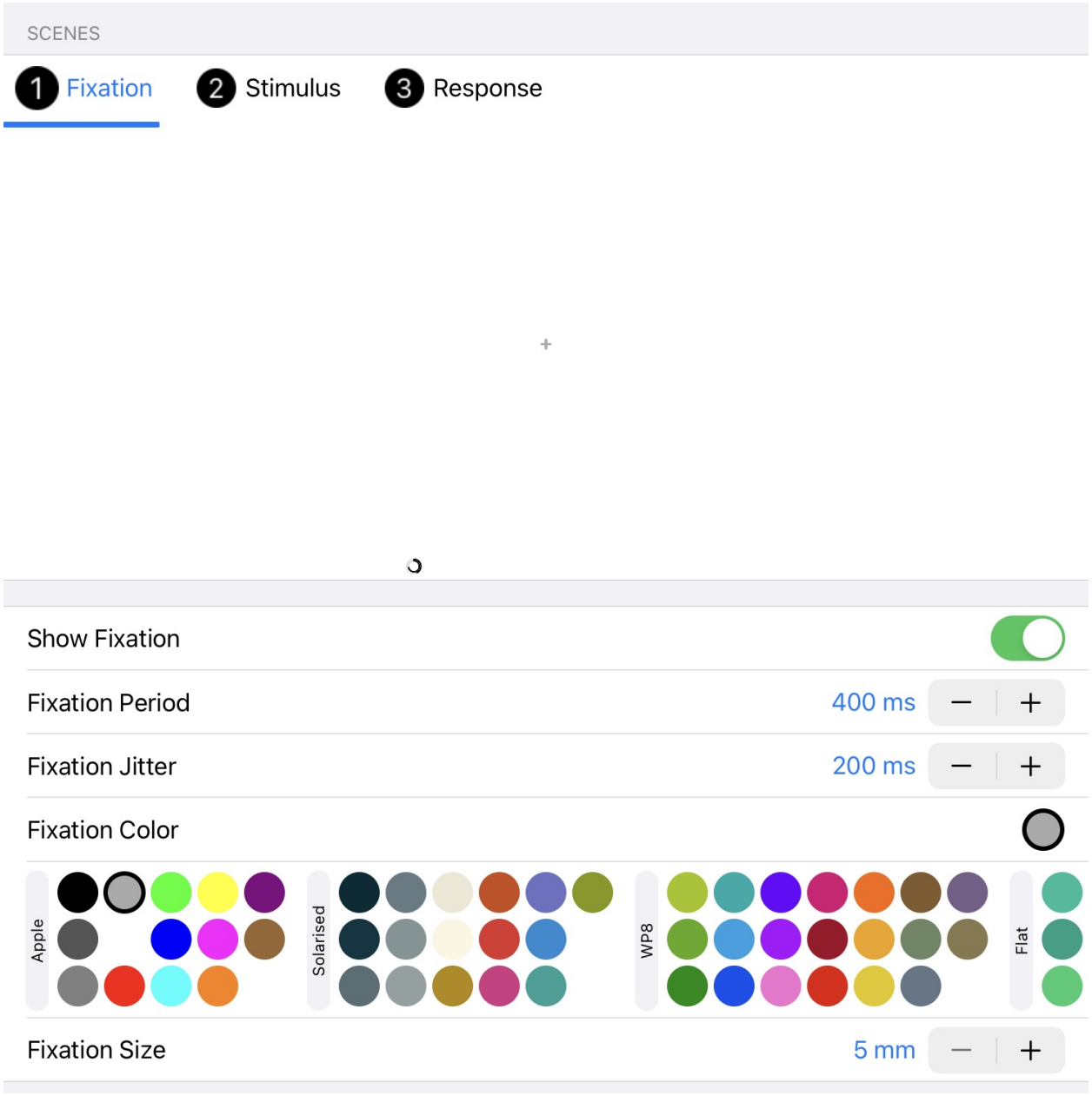
2. You can specify whether the game is hidden or not from the menu screen. Note, this does not delete the configuration, it just hides it.

3. PEER will tell you the category of game you are playing - here it is N-Back - there is only one category of this game in PEER.

4. You can specify the recording name to be used at the end of the game.

5. You can specify the number of blocks of oddball to play and the number of trials within each block. We typically recommend 4 blocks of 50 trials to get a reasonable ERP response.

6. You can specify the background colour of the game. Here it is set to white.



As you scroll down, in the next part of the configuration screen, you can specify actual game properties. You will note this game has two game screens, each which you can customize separately.

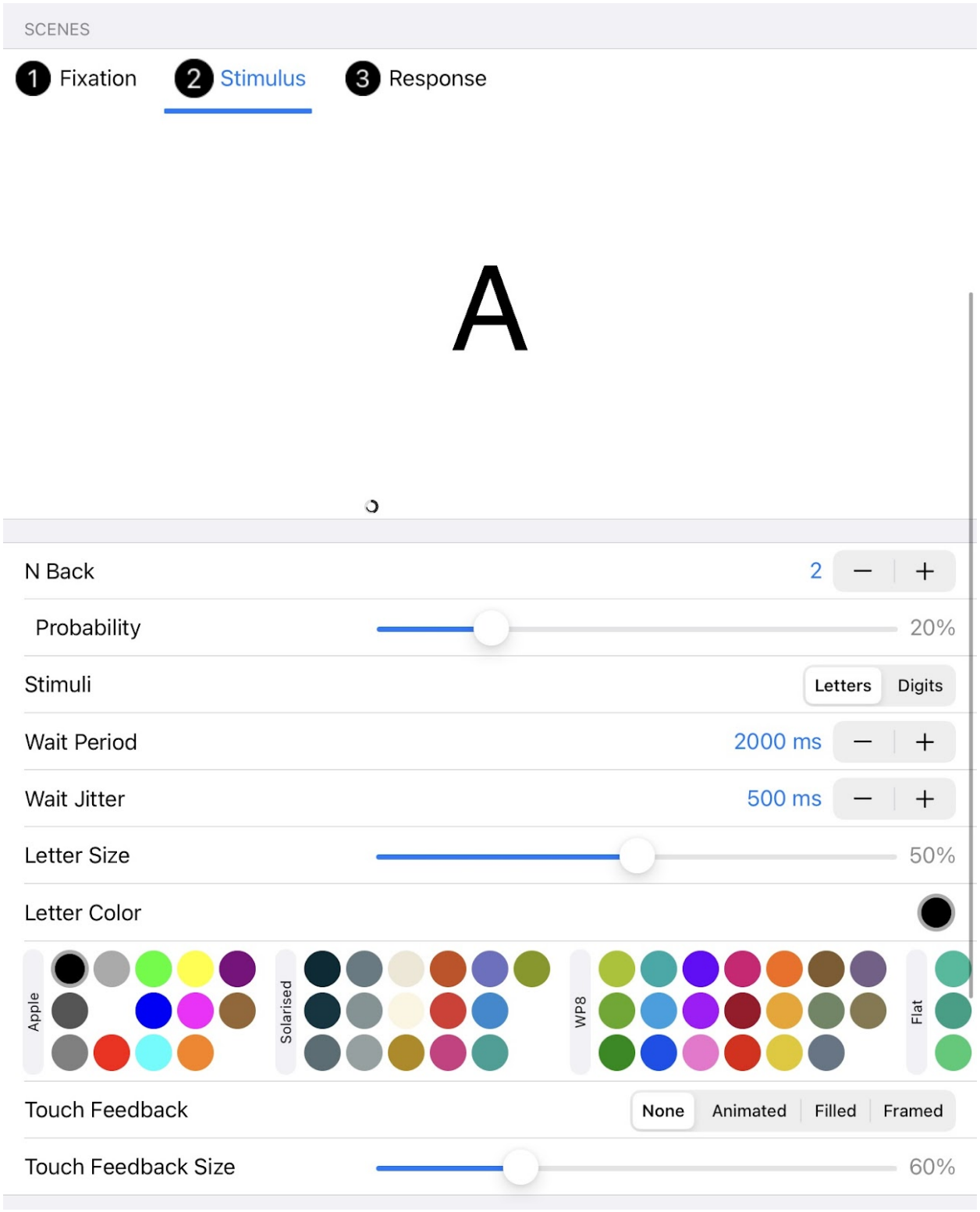
On the fixation screen you can specify:

1. The period of the fixation stimulus. Here we recommend 400 ms.

2. The amount of jitter to the fixation stimulus display period. Essentially, this means the fixation period time range here is 400 ms +/- 200 ms. This helps avoid anticipatory effects. We recommend 200 ms.

3. You can specify the size of the fixation stimulus in mm. Our recommended size depends on the size of the device you are using. 5mm is good for an iPad but might be too small for an iPhone.

4. You can specify the fixation colour. Note that high contrast can promote blinking which can be bad for ERP studies hence why we are recommending grey on a white background.



On the next scene, you specify game properties specific to the nBack.

1. You can specify how far back the nBack is set to - here it is two. So, if you see the letter A repeated two back, it would be a hit. For example "A S A" is a hit but "A A D" is not. You would touch the screen for the first example and be correct. If you touched the screen for the second example you would be incorrect.

2. You can specify the probability of a nBack being triggered on any given trial. Here is it 20% which is our recommended value.

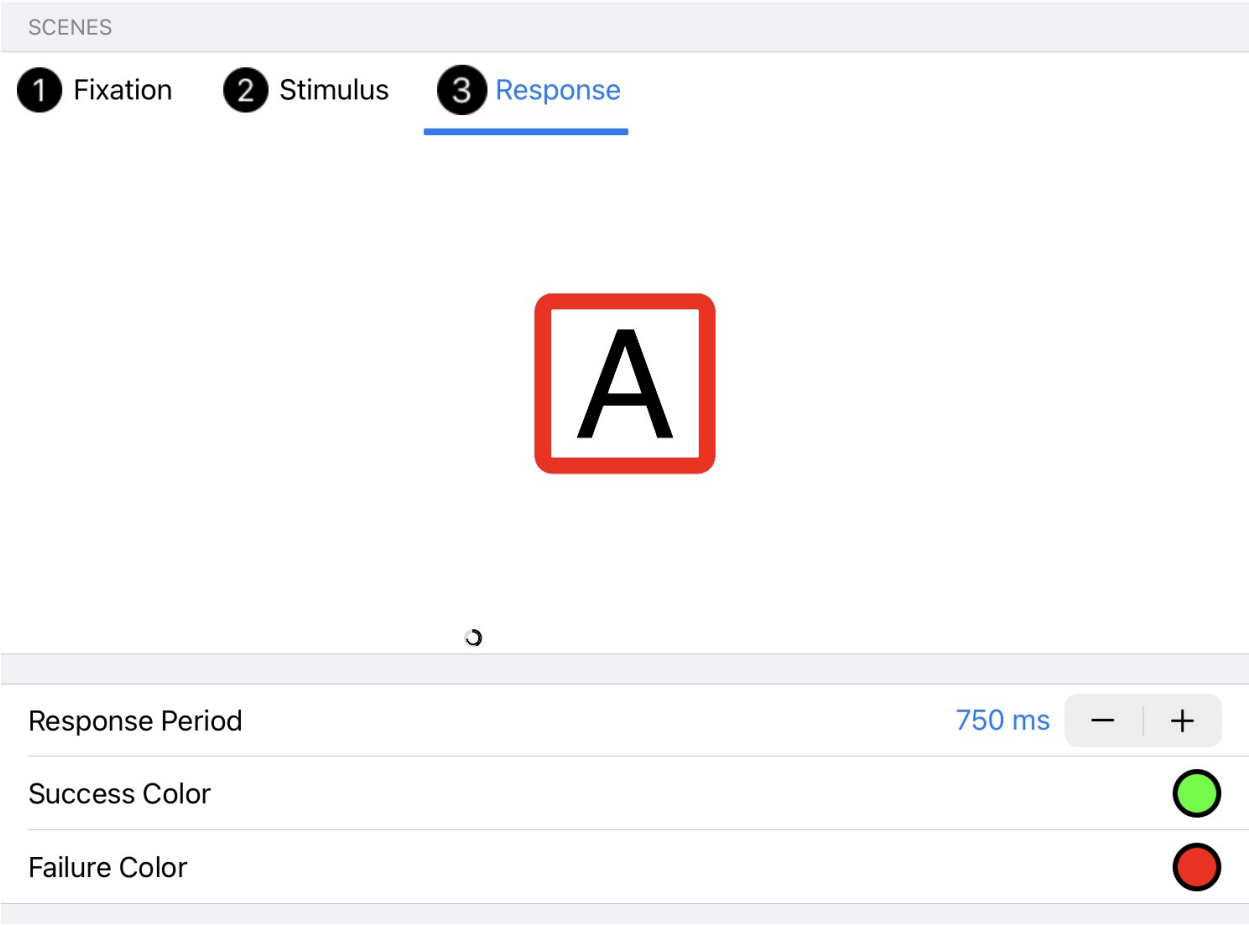
3. You can specify whether the nBack string is comprised of letter or digits. Letters make it more difficult so it depends on who you are assessing.

4. Next, you can specify how long the letter is on screen and the jitter for this. We recommend 2000 ms with 500 ms of jitter.

5. You can specify the physical size of the letter as a percentage of the display.

6. You can specify the colour of the letters (or digits).

7. You can specify whether or not the user gets touch feedback when they tap the screen.

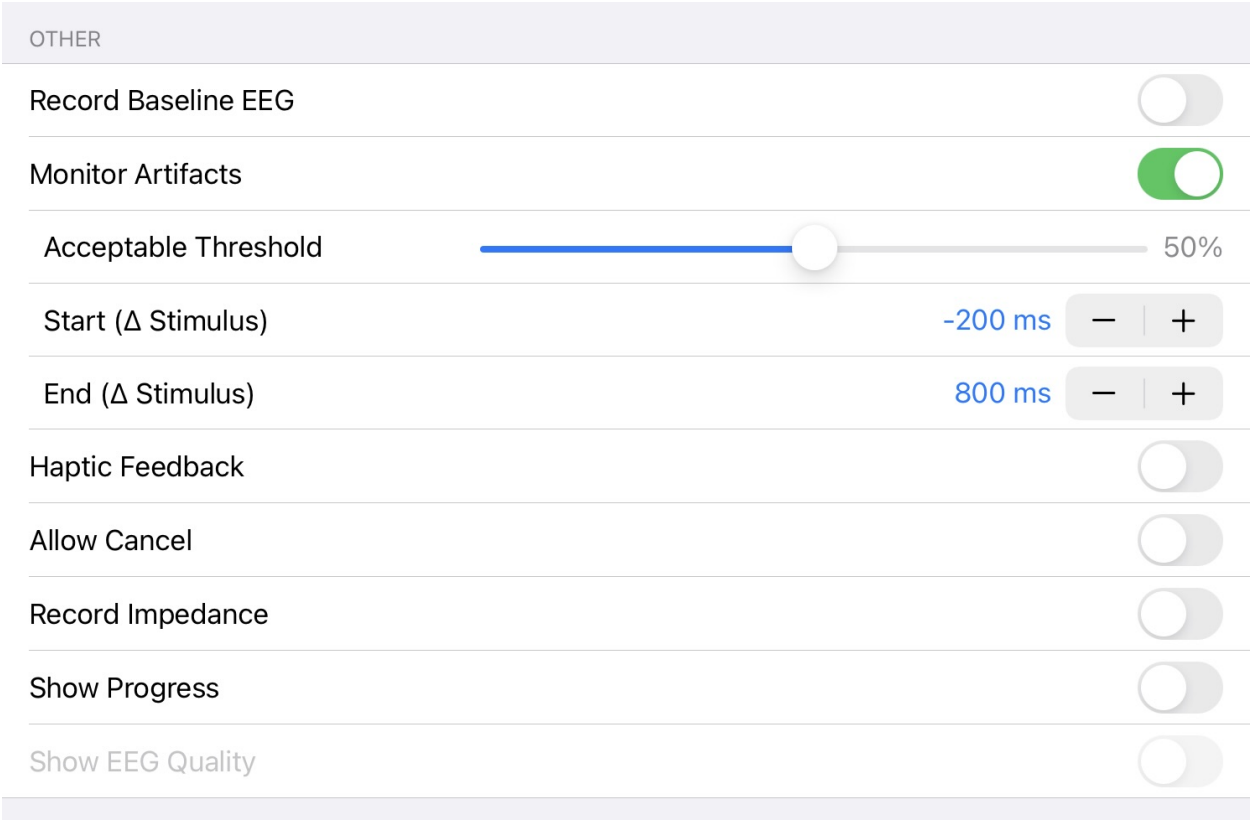


On the next nBack screen, you specify features about the response.

1. How long the user has to respond to be considered accurate. We recommend 750 ms.

2. The highlight colour for a correct response.

3. The highlight colour for an incorrect response.



Finally, as you scroll to the bottom of the configuration screen you can specify some additional PEER features.

1. You can specify whether or not PEER records a period of EEG data before the game starts.

2. You can specify whether or not PEER monitors artifacts for you. Essentially, if the signal is too noisy within a block of trials, PEER will redo that block of trials. In this case, if PEER judges you will lose more than 50% of the trial data - based on artifacts that occur from between 200 ms stimulus onset to 800 ms after stimulus offset, PEER will want to redo the block of trials.

3. You can specify whether or not PEER provides haptic feedback when you touch the screen.

4. You can specify whether or not there is a cancel button onscreen while the game is playing.

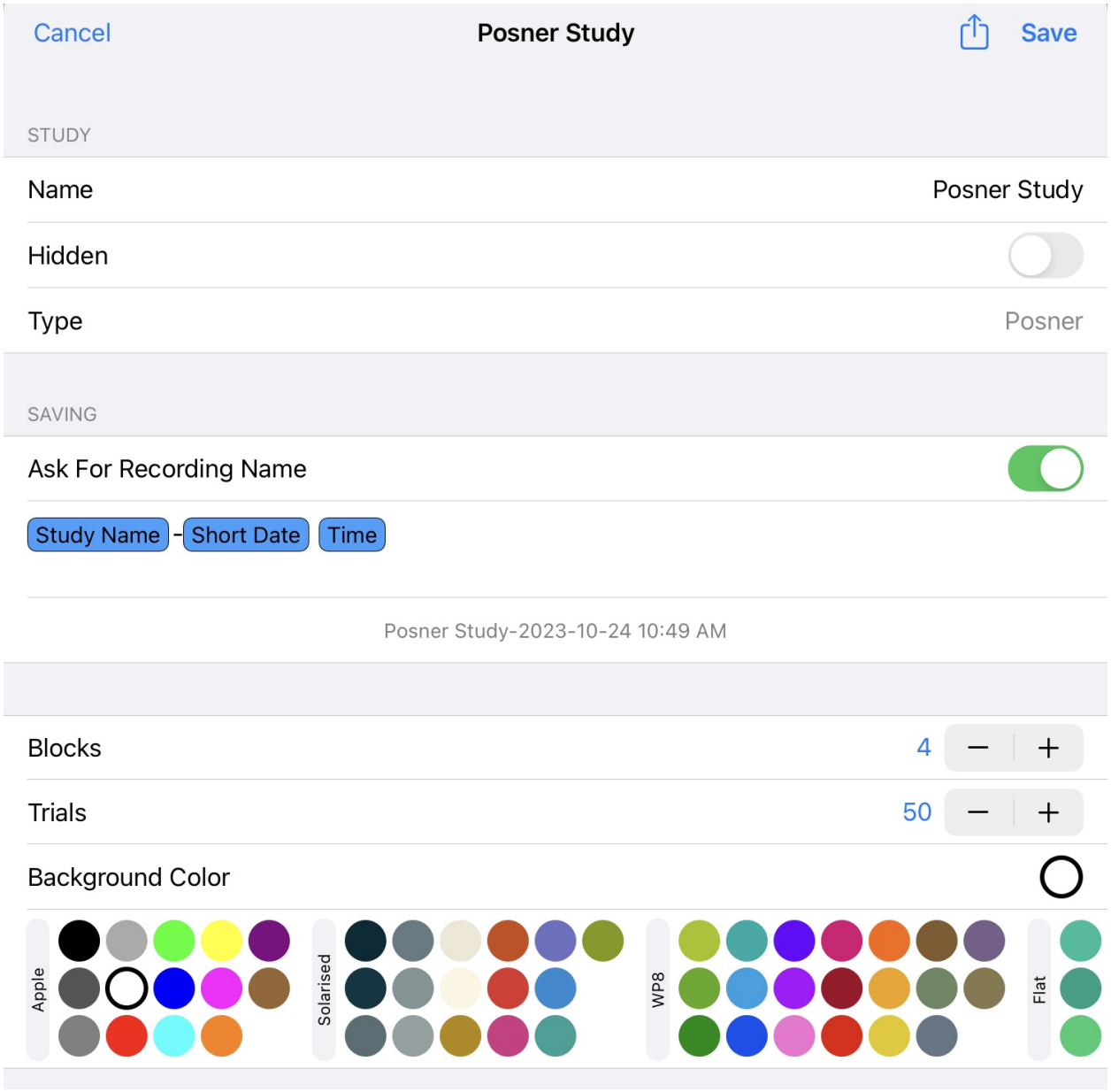
5. You can specify whether or not PEER records impedance values.

6. You can specify whether or not PEER shows a progress bar during the game.

7. You can specify whether or not PEER displays EEG quality in real time.

Configuring the Posner Task

The Posner game can be configured in a variety of ways to support your research needs.



In the top part of the configuration screen, you can do the following:

1. Specify a unique study name for each configuration - here we are simply calling it "Posner Study".

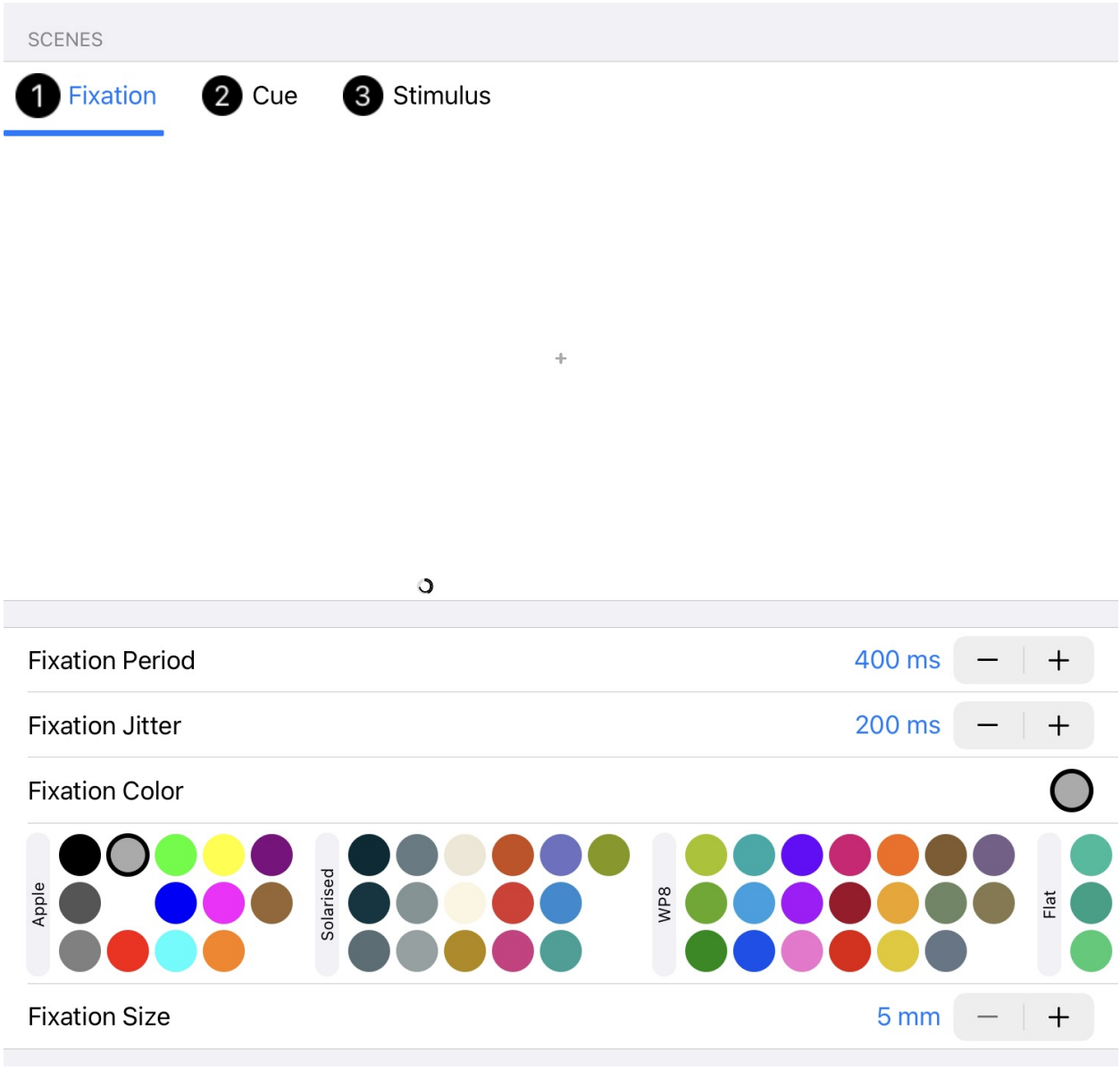
2. You can specify whether the game is hidden or not from the menu screen. Note, this does not delete the configuration, it just hides it.

3. PEER will tell you the category of game you are playing - here it is Posner - there is only one category of this game in PEER.

4. You can specify the recording name to be used at the end of the game.

5. You can specify the number of blocks of oddball to play and the number of trials within each block. We typically recommend 4 blocks of 50 trials to get a reasonable ERP response.

6. You can specify the background colour of the game. Here it is set to white.



As you scroll down, in the next part of the configuration screen, you can specify actual game properties. You will note this game has two game screens, each which you can customize separately.

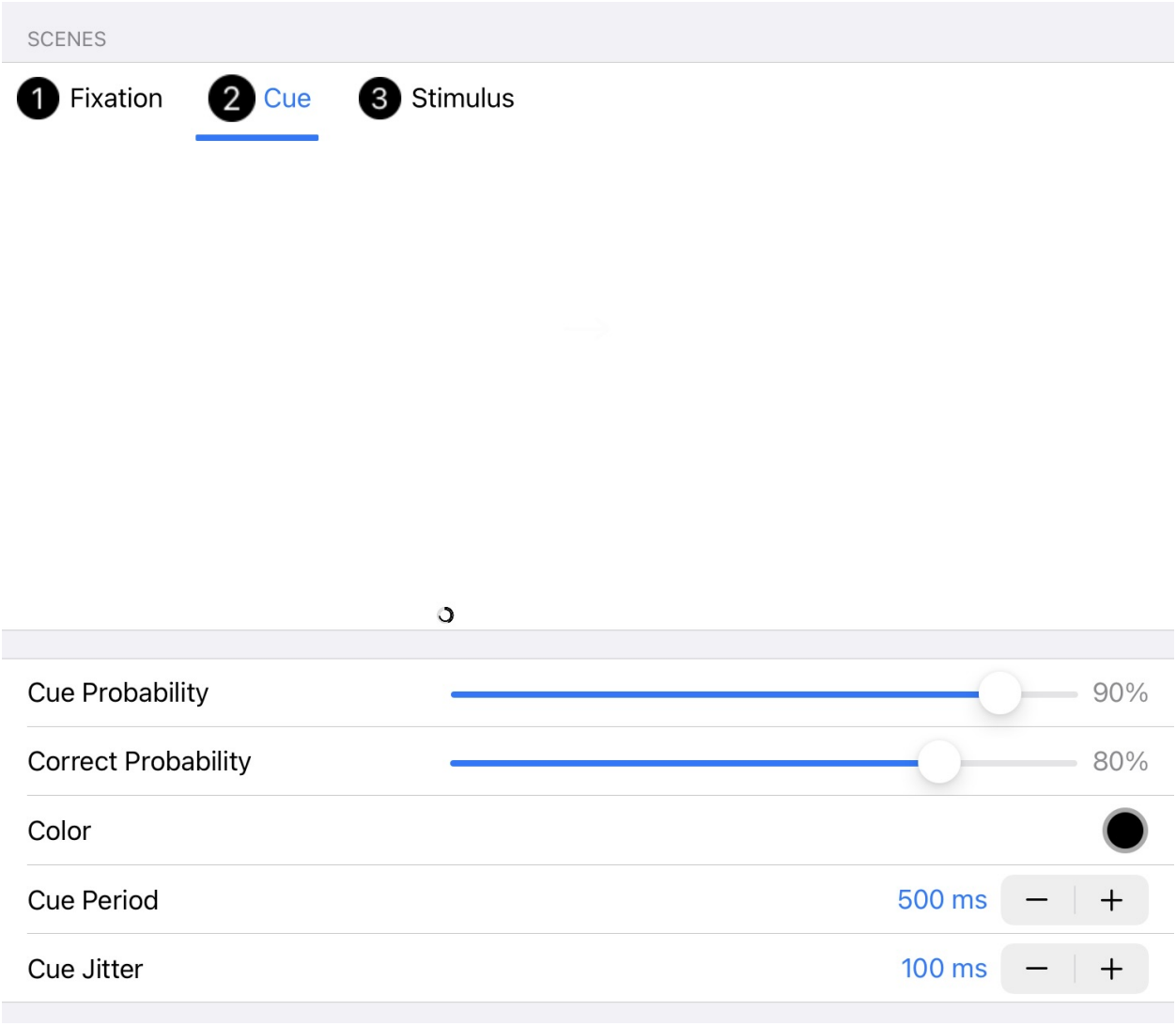
On the fixation screen you can specify:

1. The period of the fixation stimulus. Here we recommend 400 ms.

2. The amount of jitter to the fixation stimulus display period. Essentially, this means the fixation period time range here is 400 ms +/- 200 ms. This helps avoid anticipatory effects. We recommend 200 ms.

3. You can specify the size of the fixation stimulus in mm. Our recommended size depends on the size of the device you are using. 5mm is good for an iPad but might be too small for an iPhone.

4. You can specify the fixation colour. Note that high contrast can promote blinking which can be bad for ERP studies hence why we are recommending grey on a white background.



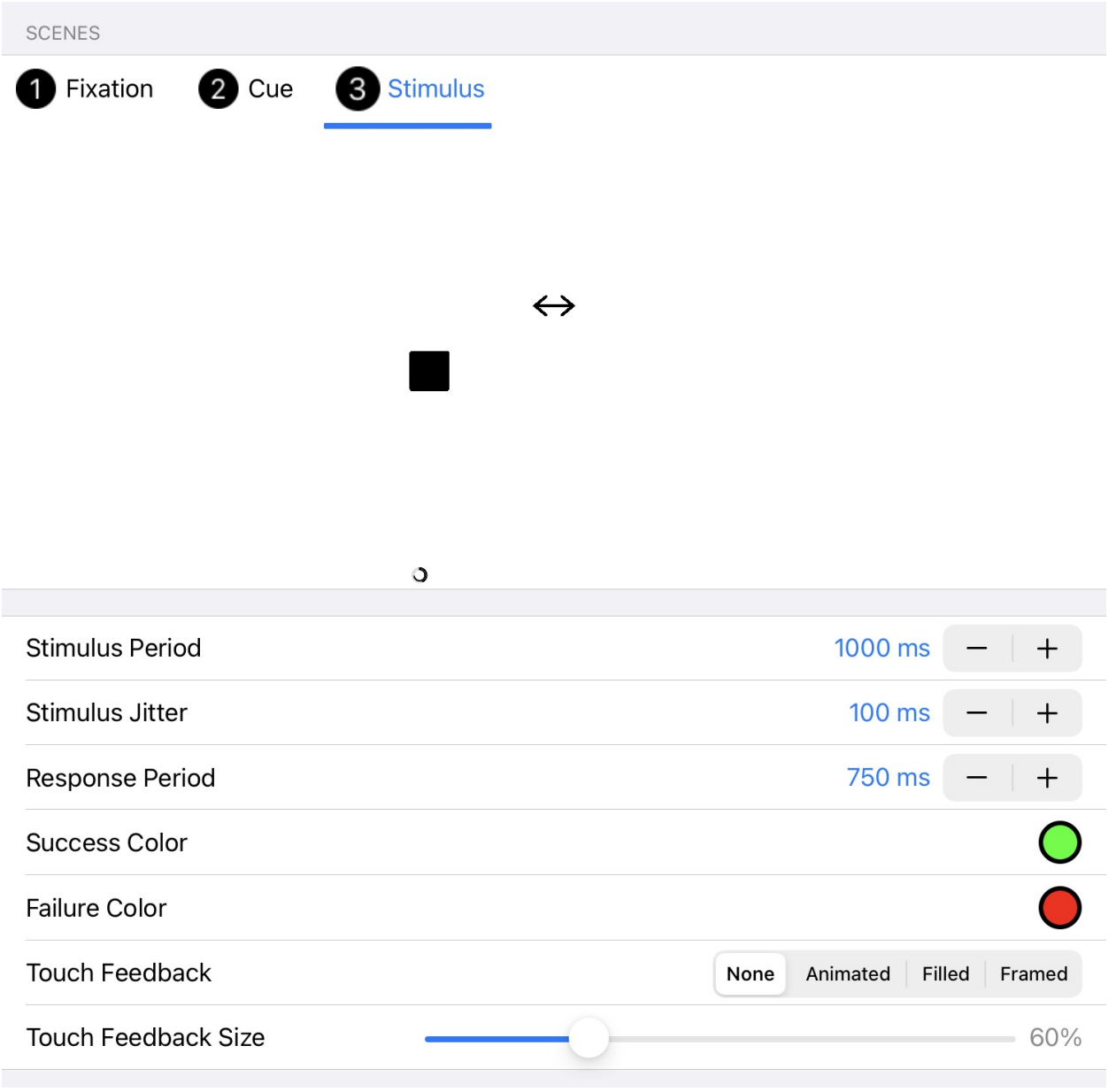
In the next scene, you specify cue properties for the Posner game.

1. You can specify the probability with which the cue appears.

2. You can specify the probability that the cue is valid (will point to the correct target location).

3. You can specify the colour of the cue.

4. You can specify the cue period (how long it is on the screen) and the jitter of that time period. So here the cue is onscreen for 500 +/- 100 ms. All of the values you see here we recommend.



On the stimulus scene, we can specify the following:

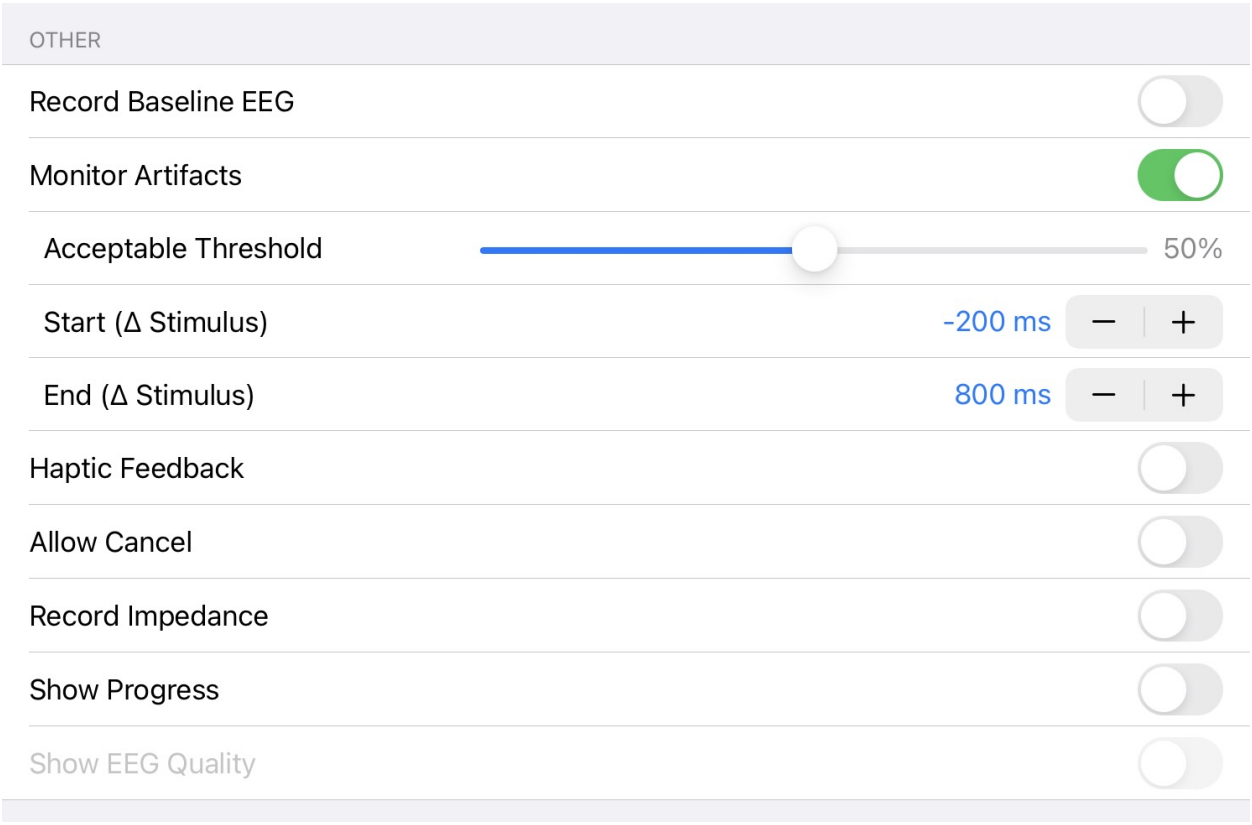
1. How long the stimulus is onscreen.

2. The jitter associated with this time.

3. How long the use has to respond.

4. The colours that appear to signify a correct or incorrect response.

5. Whether or not the user receives touch feedback about their response.



Finally, as you scroll to the bottom of the configuration screen you can specify some additional PEER features.

1. You can specify whether or not PEER records a period of EEG data before the game starts.

2. You can specify whether or not PEER monitors artifacts for you. Essentially, if the signal is too noisy within a block of trials, PEER will redo that block of trials. In this case, if PEER judges you will lose more than 50% of the trial data - based on artifacts that

occur from between 200 ms stimulus onset to 800 ms after stimulus offset, PEER will want to redo the block of trials.

3. You can specify whether or not PEER provides haptic feedback when you touch the screen.

4. You can specify whether or not there is a cancel button onscreen while the game is playing.

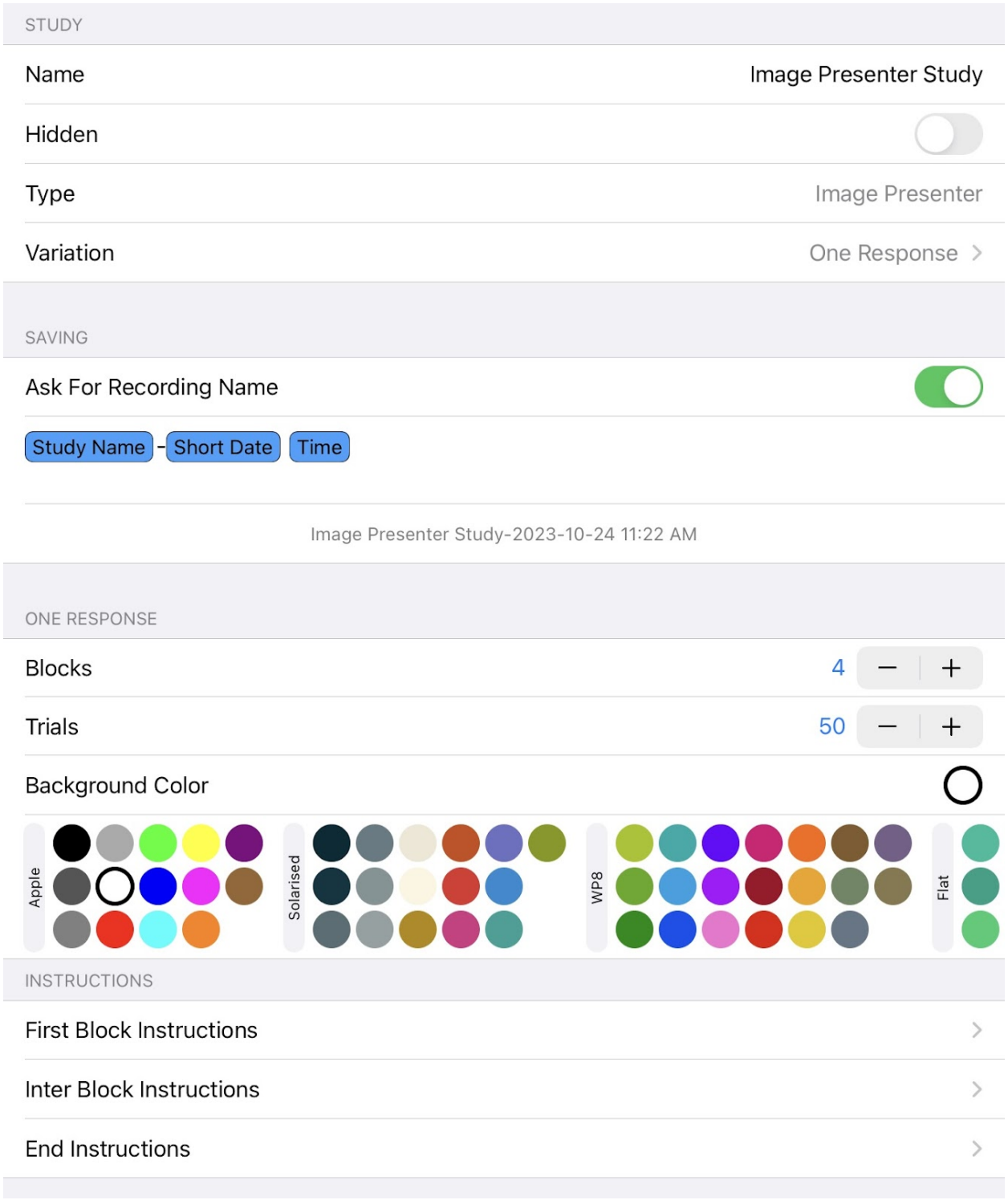
5. You can specify whether or not PEER records impedance values.

6. You can specify whether or not PEER shows a progress bar during the game.

7. You can specify whether or not PEER displays EEG quality in real time.

Configuring Image Presenter

Image Presenter can be configured in a variety of ways to support your research needs.



In the top part of the configuration screen, you can do the following:

1. Specify a unique study name for each configuration - here we are simply calling it "Image Presenter Study".

2. You can specify whether the game is hidden or not from the menu screen. Note, this does not delete the configuration, it just hides it.

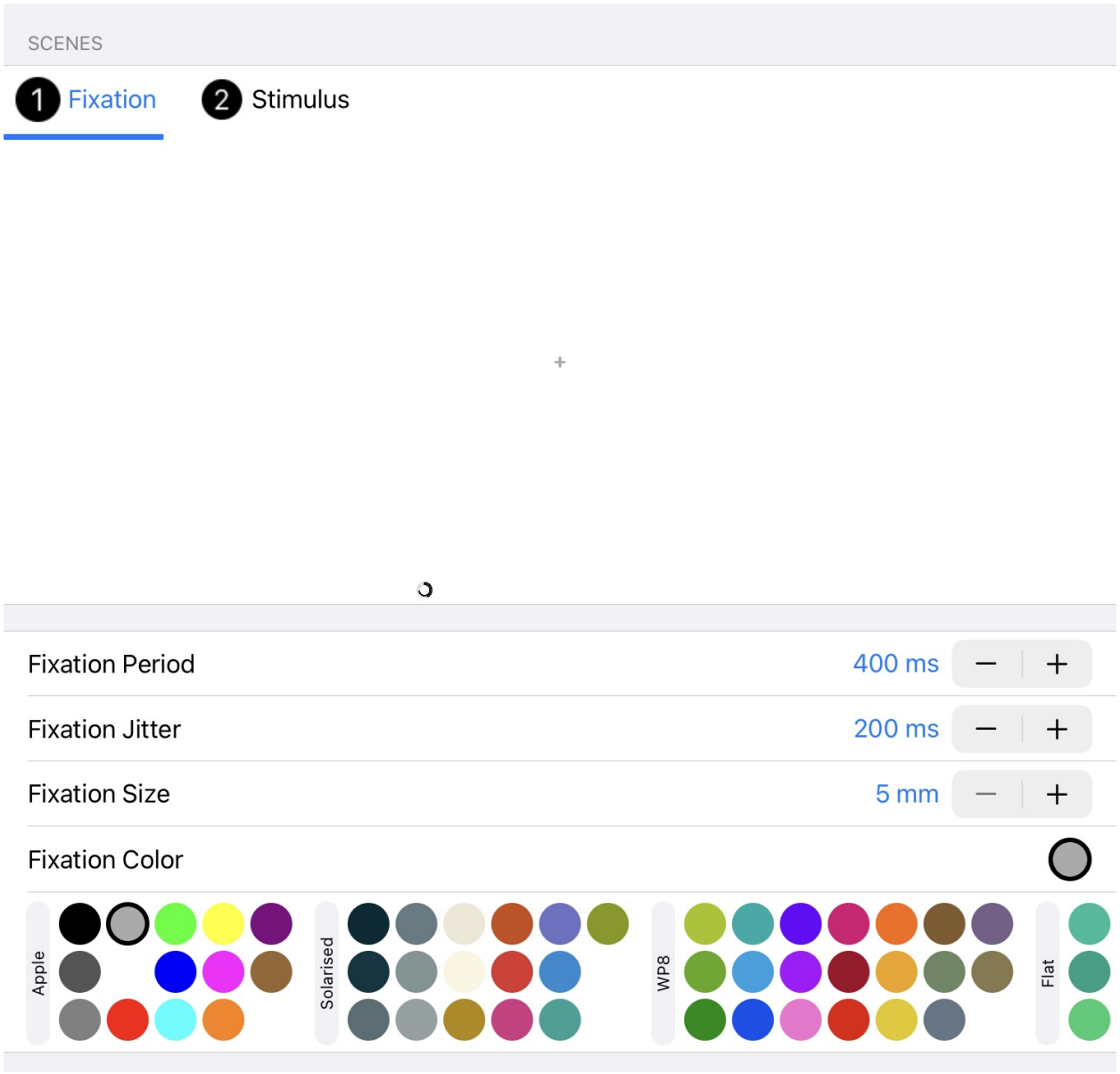
3. PEER will tell you the category of game you are playing - here it is Image Presenter - there is only one category of this game in PEER.

4. You can specify the recording name to be used at the end of the game.

5. You can specify the number of blocks of oddball to play and the number of trials within each block. We typically recommend 4 blocks of 50 trials to get a reasonable ERP response. For Image Presenter however, the number of blocks and trials does depend on your stimulus array and what you hope to achieve.

6. You can specify the background colour of the game. Here it is set to white.

7. You can also change the text of the instruction screens as needed for your experiment.



As you scroll down, in the next part of the configuration screen, you can specify actual game properties. You will note this game has two game screens, each which you can customize separately.

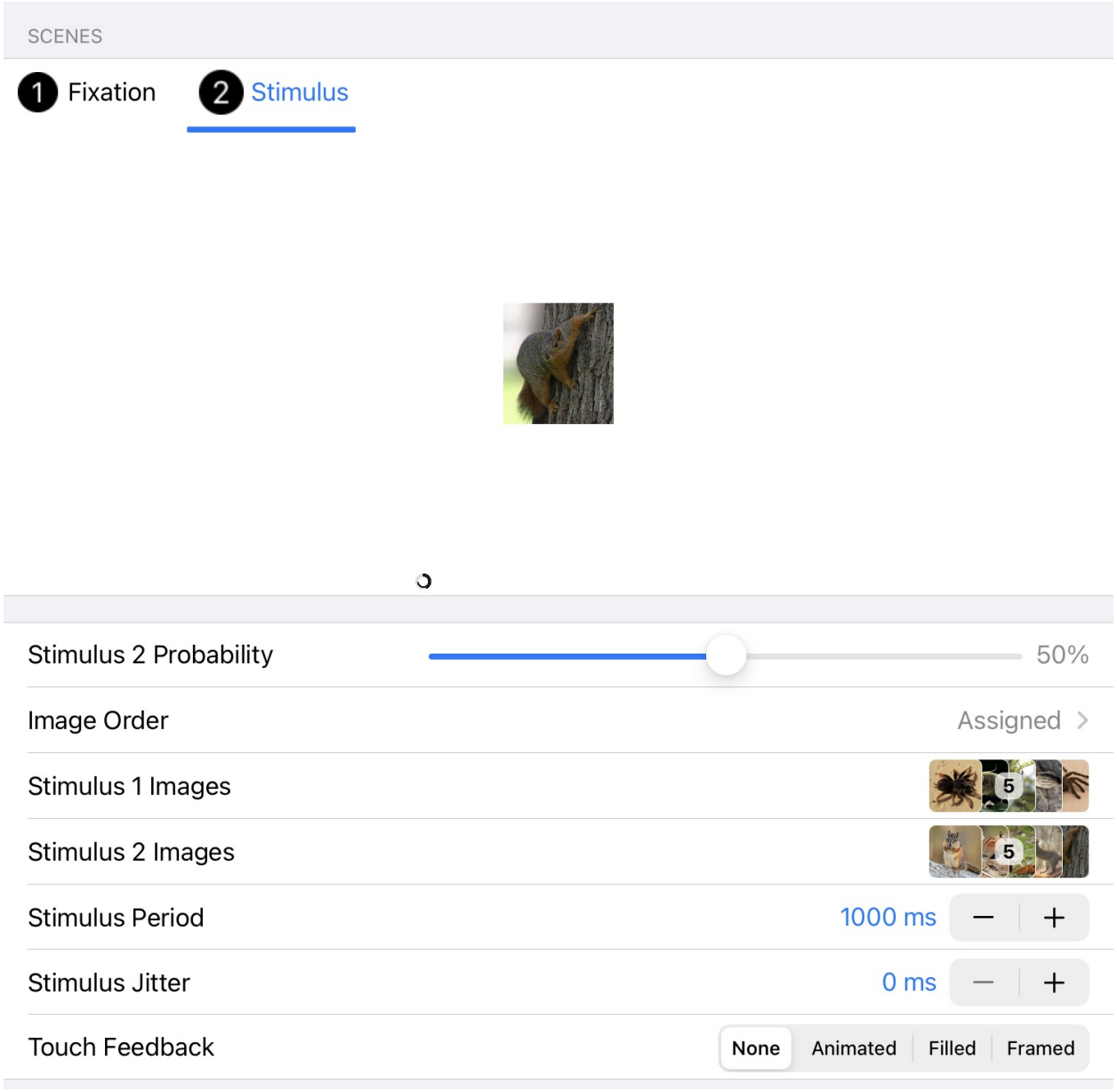
On the fixation screen you can specify:

1. The period of the fixation stimulus. Here we recommend 400 ms.

2. The amount of jitter to the fixation stimulus display period. Essentially, this means the fixation period time range here is 400 ms +/- 200 ms. This helps avoid anticipatory effects. We recommend 200 ms.

3. You can specify the size of the fixation stimulus in mm. Our recommended size depends on the size of the device you are using. 5mm is good for an iPad but might be too small for an iPhone.

4. You can specify the fixation colour. Note that high contrast can promote blinking which can be bad for ERP studies hence why we are recommending grey on a white background.



On the stimulus screen, you can configure Image Presenter in terms of how the images are shown.

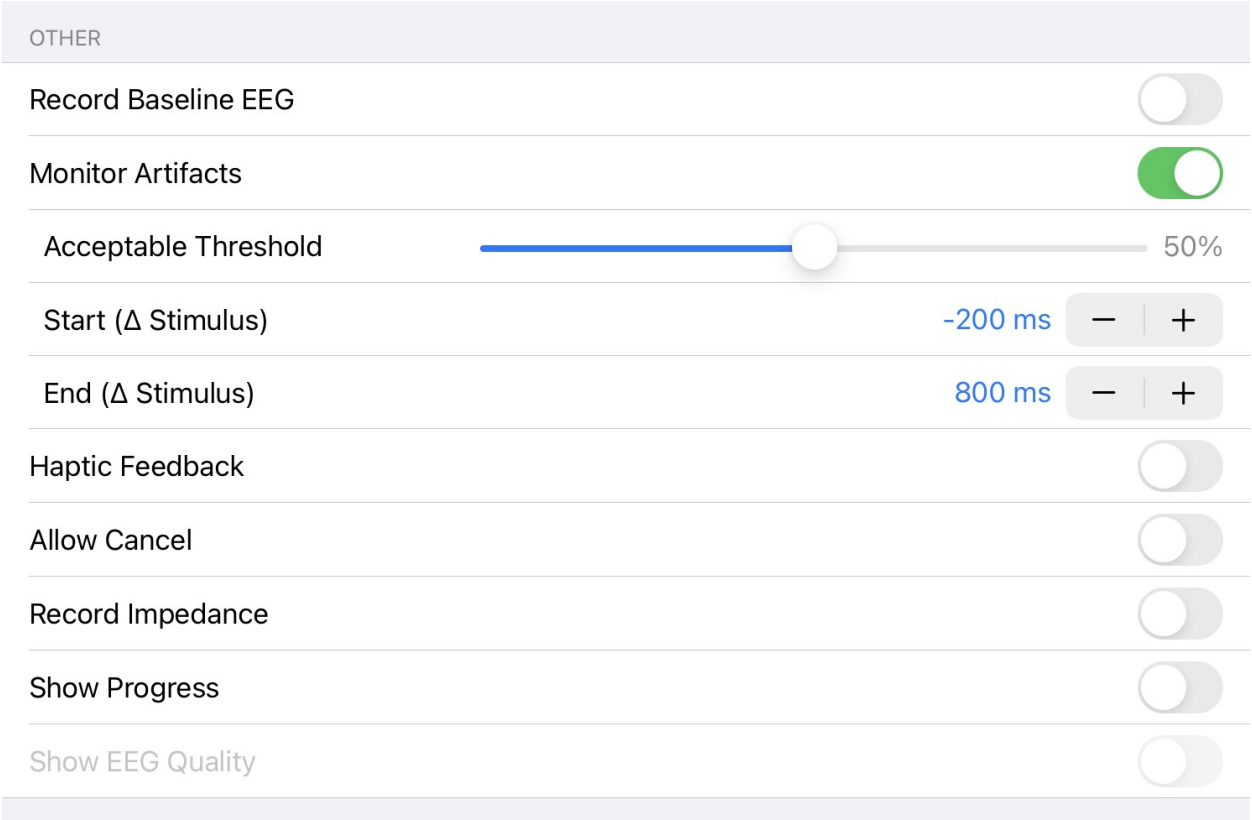
1. You can assign the probability to the second category of images. At 50% as it is set here, images will be taken from both categories with equal probability.

2. The image order here is set to assigned. That means the images in a category will be presented in order. You can change this to random or random within a block.

3. You can upload your own images for each category. PEER can hold thousands of images (4999 to be exact). Note, it is up to the user to configure the images so that they are all the same size, resolution, luminance, etc.

4. You can specify how long each image is on the screen and whether or not there is jitter to this time.

5. You can specify whether or not there is touch feedback for each image.



Finally, as you scroll to the bottom of the configuration screen you can specify some additional PEER features.

1. You can specify whether or not PEER records a period of EEG data before the game starts.

2. You can specify whether or not PEER monitors artifacts for you. Essentially, if the signal is too noisy within a block of trials, PEER will redo that block of trials. In this case, if PEER judges you will lose more than 50% of the trial data - based on artifacts that occur from between 200 ms stimulus onset to 800 ms after stimulus offset, PEER will want to redo the block of trials.

3. You can specify whether or not PEER provides haptic feedback when you touch the screen.

4. You can specify whether or not there is a cancel button onscreen while the game is playing.

5. You can specify whether or not PEER records impedance values.

6. You can specify whether or not PEER shows a progress bar during the game.

7. You can specify whether or not PEER displays EEG quality in real time.