Human Systems
integration division

NASA

NASA TLX for iOS
User Guide v1.0

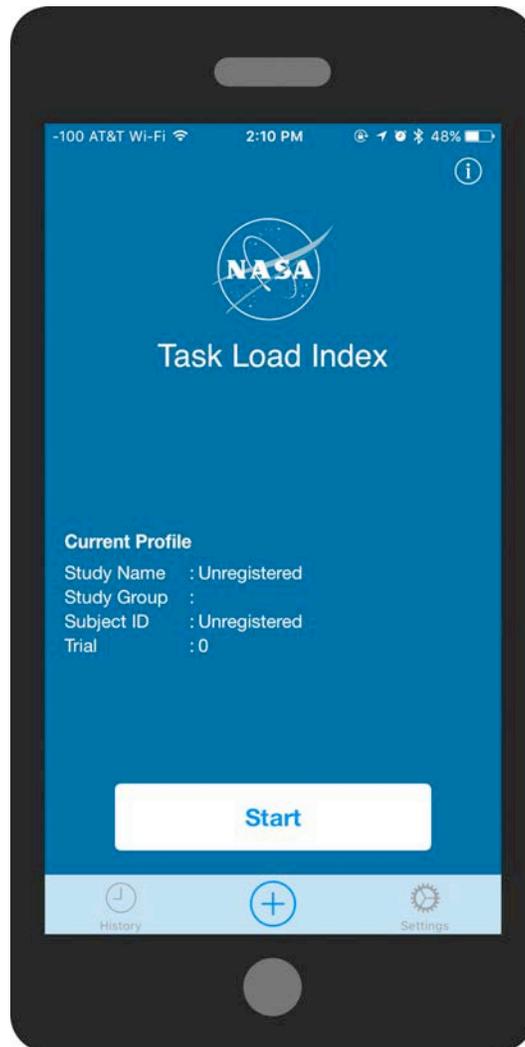**Authors:**
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Introduction

The NASA Task Load Index (TLX) app for iOS contains the critical features of the NASA TLX 1.0 paper and pencil questionnaire used to evaluate operator workload along a multidimensional scale. The user interacts with the TLX app via an iPhone, iPad, or iPod touch. When using the TLX app, a trial is defined as the completion of the TLX questionnaire.

Upon launching the app, the user will see the TLX app Start screen, which contains:

- a link to a quick start guide (information "i" icon on the upper right)
- the Current Profile indicating study parameters
- a Start button
- a bottom tab bar that contains a History icon, a Plus icon (+), and a Settings icon
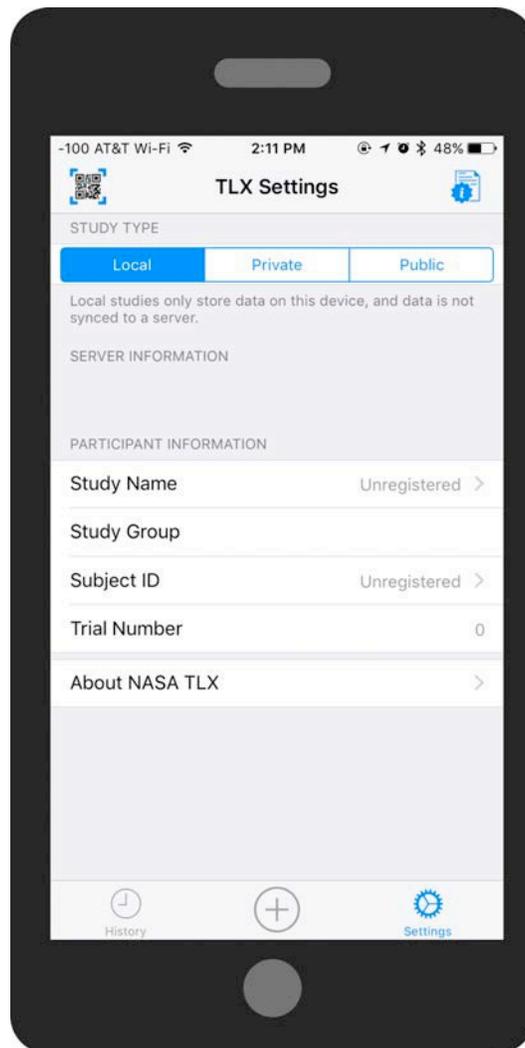
The Current Profile displays details associated with the current experimental condition of the TLX's administration. This information comes from values entered by the experimenter in the Settings tab, which is accessible by tapping the Settings icon on the tab bar at the bottom of the screen. The experimenter must first perform this setup prior to administering the TLX questionnaire.

Getting Started

1. Enter Settings Tab

The Settings tab allows the experimenter to enter configuration information associated with the TLX administration of the test scenario. From the Start screen, tap the Settings icon in the tab bar to enter the Settings tab.

2. Specify Study Type

An experimenter can set up a study to be one of three different types:

- Local
- Private
- Public

Local studies are intended for smaller studies that are typically performed in an experimenter's own laboratory. Local studies capture results from TLX trials in the History tab. Experimenters can export individual TLX trial results as CSV files from the History tab for further analysis. Local studies do not synchronize TLX results to a server; TLX results from local studies are accessible only on the iOS device until an experimenter exports them to another location.

Private studies (future feature) are intended for experiments involving a specific participant population. In addition to storing TLX results in the History tab, private studies also simultaneously push TLX results in CSV format to a server specified by the experimenter.

Public studies (future feature) are intended for experiments that are open to the public. Any interested participants can view a list of these studies and can join any of these studies at their prerogative. The TLX results from these studies are pushed to a server whose configuration details are provided by the experimenter and entered by the participant. The ability to conduct public studies is a feature that is planned for a future release of this app.

3. Enter Server Information — Selected Server (private and public studies only)

For private and public studies, the experimenter must specify server configuration information to inform the app of where TLX trial results are to be stored.
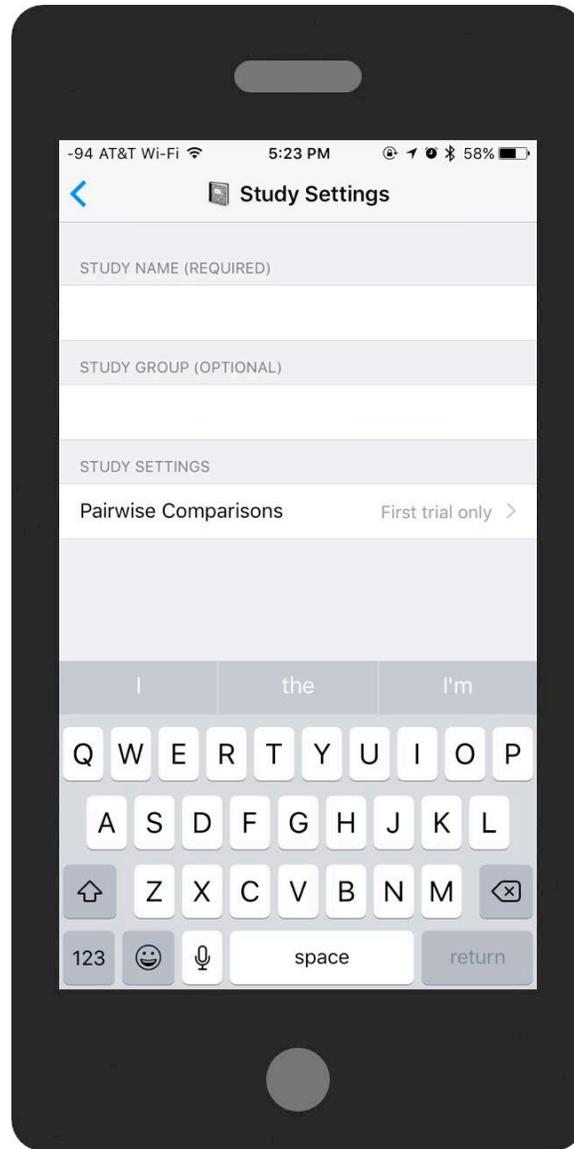
4. Enter Participant Information — Study Name and Study Group

Participant information contains fields that are available for the experimenter to enter the experimental information about the participant in the given study. These include:
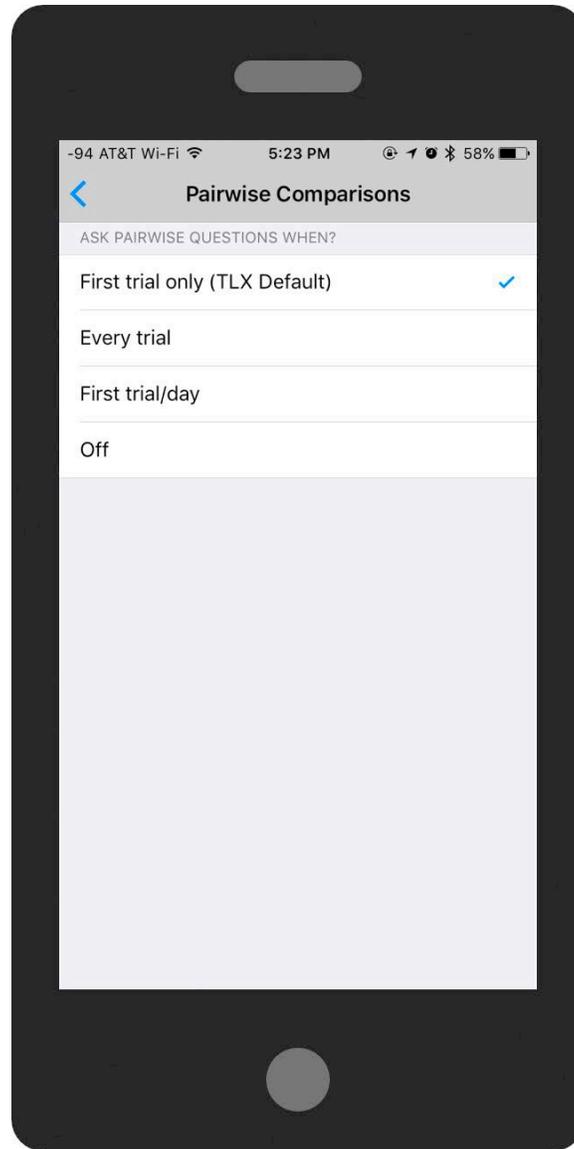
- Study Name
- Study Group (optional)
- Subject ID

The experimenter must enter this information according to the scenario and experimental condition that the participant is undergoing in the experiment.

Under Participant Information on the Settings page, tap Study Name. On the resulting Study Settings screen, enter a name for the study. Enter a Study Group (optional).
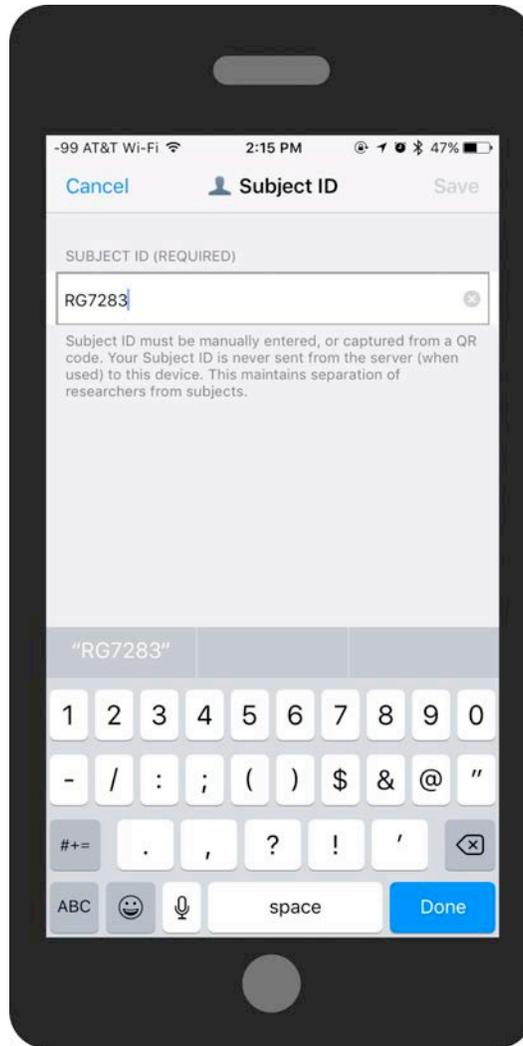
Then, tap Pairwise Comparisons to specify when the app should ask the participant Pairwise Comparison questions.

Answers from Pairwise Comparison questions reduce some of the variability associated with the scoring of the individual rating subscales. The Pairwise Comparisons setting allows the experimenter to weigh the rating subscales according to the dimension of the given pairwise feature using the following selector options:
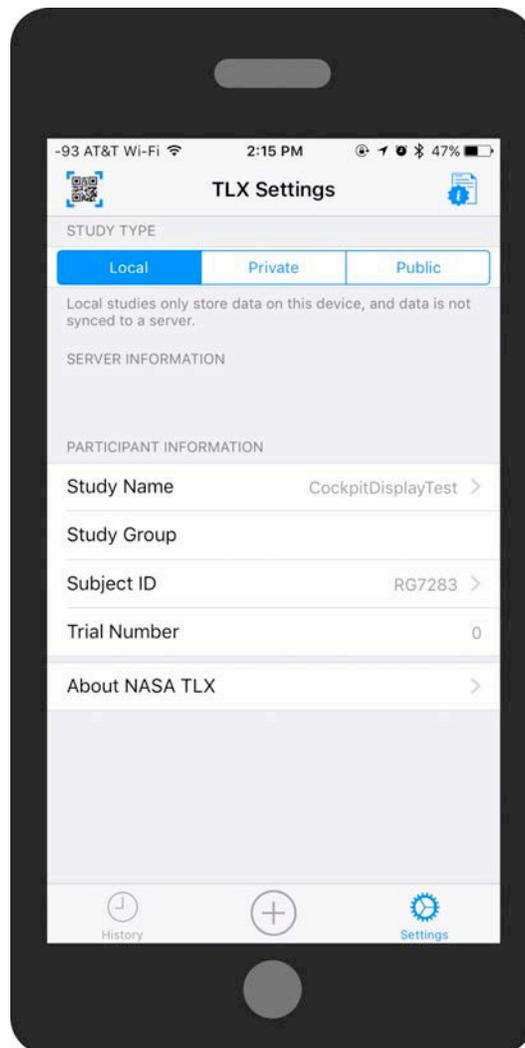
- First trial only (default) — the app will ask the participant to answer Pairwise Comparison questions only during the first trial.
- Every trial — the app will ask the participant to answer Pairwise Comparison questions during every trial.
- First trial/day — the app will ask the participant to answer Pairwise Comparison questions only during the first trial of each calendar day.
- Off — the app will never ask the participant to answer Pairwise Comparison questions.

Tap the back button (chevron) at the top left-hand corner of the screen twice to return to the Settings tab. Then, tap Subject ID.

5.   Enter Subject ID

Once the experimenter has entered a Subject ID, tap Done, then tap Save. The app will validate the Subject ID and return to the Settings tab.

Note that the Trial Number is automatically incremented by the app for a given Study Name and Subject ID and cannot be manually overridden by the experimenter or participant.

6. Begin TLX trial

Once the study type and participant information has been configured in Settings, tap the Plus (+) icon on the tab bar to return to the Start screen.
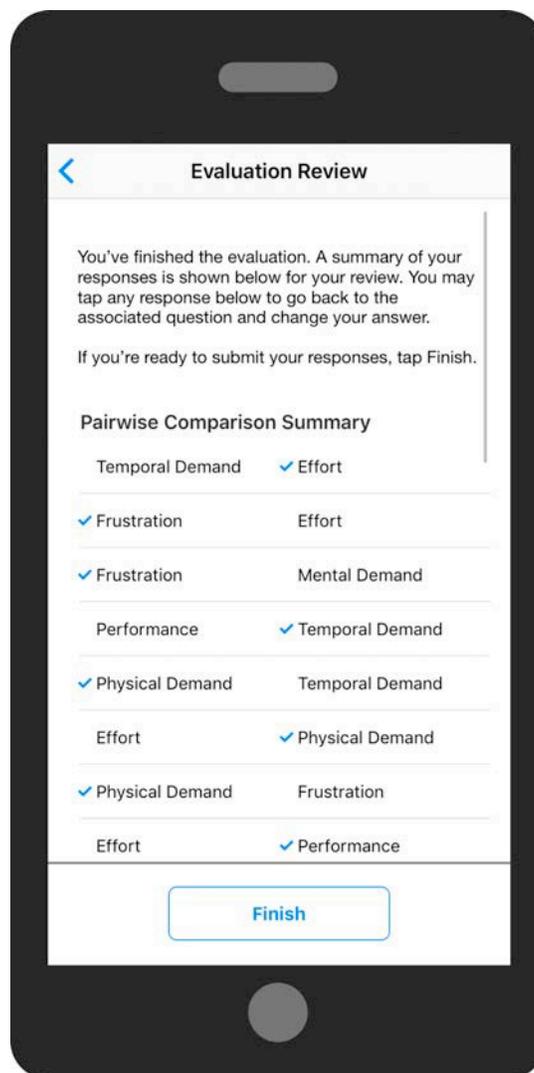
To start the TLX trial, tap the Start button. The app will bring the study participant to the instruction page. The participant advances to the next screen by tapping the Next button, and can go back to the previous screen by tapping the back button on the upper left-hand corner. The participant may quit a TLX trial at any time by tapping Quit on the upper right-hand corner.

After the instruction page, the app will display the definitions of the six workload factors to ensure participant understanding. These definitions are to be used as the participant provides workload estimates on the questions that follow.

If the Pairwise Comparison is enabled for the current TLX trial, the app will then display an introduction to the Pairwise Comparisons. The participant should then answer 15 pairwise comparison questions to determine weighting of the six subscales that will follow. On any of the Pairwise Comparison questions, the participant can tap the information icon in the upper right-hand corner to display the definitions of each workload factor.
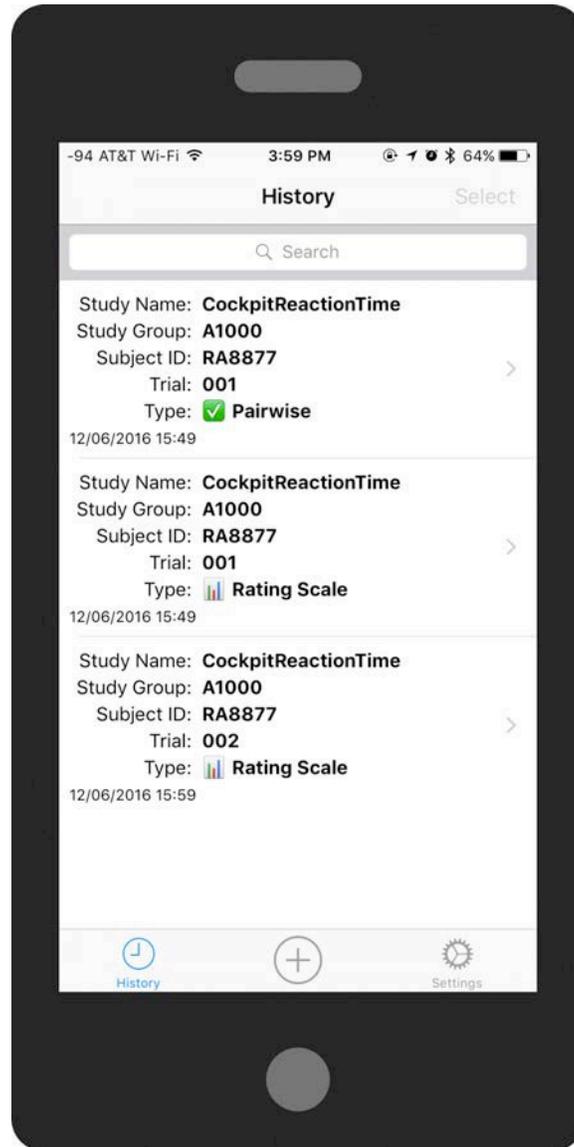
The app will then present the study participant Rating Scales questions. For each of the six rating scales, the app will display instructions on a screen to direct the participant to tap the perceived workload along a scale. This action will move a marker along the scale to mark a workload value along the scale. The participant may also drag this marker to a desired location. Have the participant answer each these questions.

Upon completion of the six rating scales, the user will be provided with a summary of weightings from the pairwise comparisons (if used) and ratings scales. The participant can tap on a particular area if a change to any of these questions is desired. Once the participant has checked his or her responses, tapping Finish will submit and save these answers. The app will return to the Start screen.
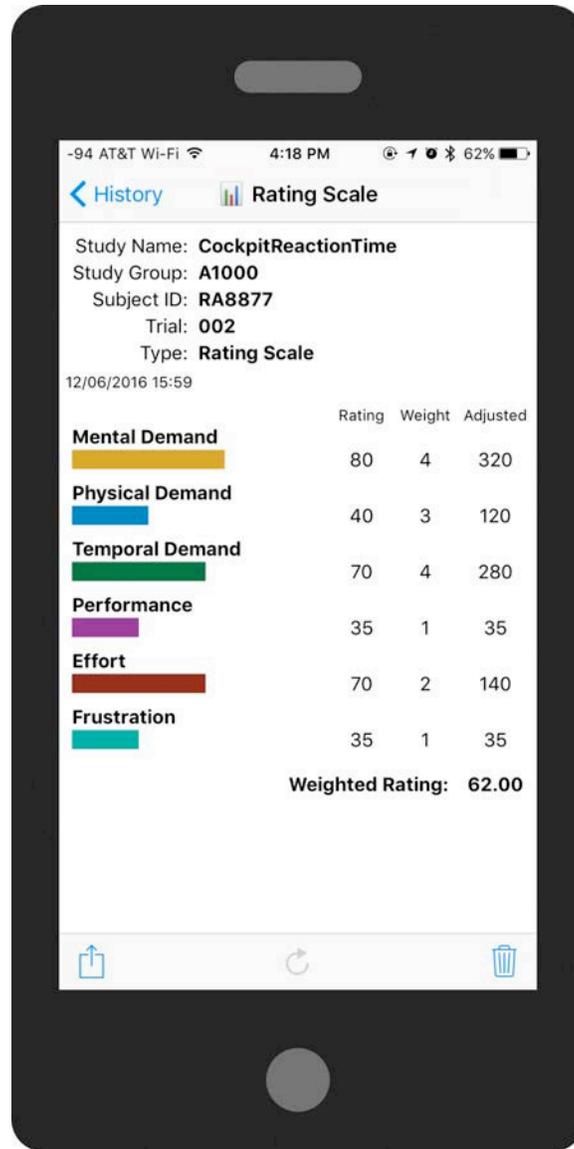

7. View History and Send Results for Analysis

Tap the History icon on the tab bar. An experimenter can view a list of past TLX trials on the History tab; each row displays the Study Name, Study Group, Subject ID, and Trial number, along with a date and time stamp to indicate when the TLX trial was completed. Trials that include both Pairwise Comparison and Rating Scale results are broken out separately in the list view. Tapping a TLX trial result from the list will result in a detailed view for that trial.

From the detailed view, an experimenter can export this TLX trial result by tapping the share icon on the bottom left and tapping a destination. The app will then send a CSV file containing the TLX trial result to this location for additional data processing.

If the experimenter set up a private study, CSV files for TLX trials can also be accessed from the server specified in the Settings tab.

The latest version of this document is available at
https://humansystems.arc.nasa.gov/groups/tlx/tlxapp.php