

Importing, Plotting, Fitting, and Exporting Data

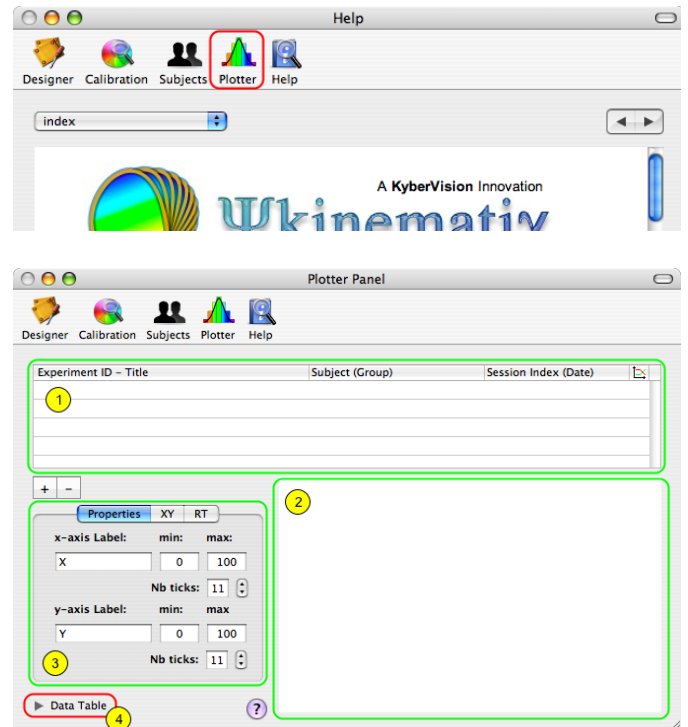
This step-by-step tutorial teaches you how to import, plot, fit and export data collected during an experimental session.

Introduction

To start, click on the **Plotter** icon in the toolbar. This opens the **Plotter Panel** as shown below.

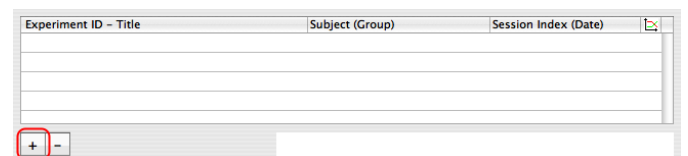
The **Plotter Panel** shows:

- 1) A hierarchical table that lists the results of the most recently performed or imported sessions
- 2) A graphing view where selected datasets are plotted
- 3) A 'tab' panel that allows the customization of the plots (Properties) and fitting parameters for each data type (XY, RT, etc.)
- 4) A small arrow in the bottom left-hand corner labelled **Data Table** that can reveal a drawer containing the data attached to the current selection in the hierarchical table (1).



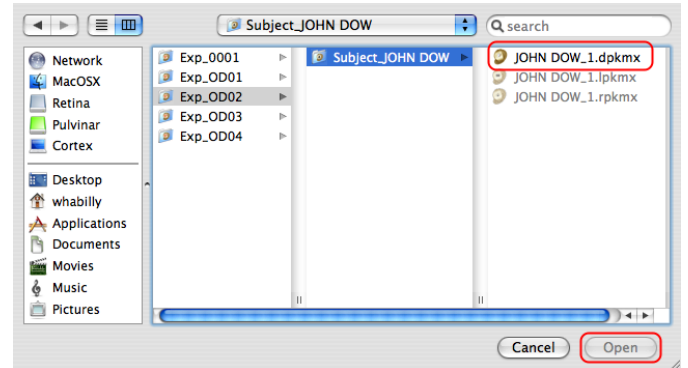
Step 1: Importing the Data

The hierarchical table (1) usually contains the session results collected since the last launch of Psykinematix. To access results from previous sessions, import them using the '+' button below the table: this can be also performed using the **Import Session** button in the



Subjects panel (see the [Managing Subjects, Groups and Sessions](#) tutorial).

Upon clicking on the '+' button, you are shown a file selection panel that allows you to select which data file to import into the Plotter table. These files have a 'dpkmx' extension and are located in the folder where your session data are stored ('~/Desktop/MyExperiments' by default).



Select a data file and click on the **Open** button.

Each new entry in the table provides a summary of the session information consisting of:

- Experiment ID and title
- Subject and group names
- Session index and date

| Experiment ID - Title | Subject (Group) | Session Index (Date) |
|-------------------------------|-------------------|-------------------------|
| OD02 - Multiple conditions OD | JOHN DOW (Normal) | #1 (05/06/07, 14:52:23) |

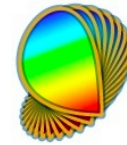
This is the first level of the results hierarchy. Click on the arrow in front of the session entry to reveal the next level.

The second level of the results hierarchy displays the datasets for each experimental condition collected during the session. Each entry at this level provides a summary of the dataset consisting of:

- Method or procedure
- Condition
- Independent variables associated with the condition

| Experiment ID - Title | Subject (Group) | Session Index (Date) |
|-------------------------------|----------------------------------|-------------------------|
| OD02 - Multiple conditions OD | JOHN DOW (Normal) | #1 (05/06/07, 14:52:23) |
| Staircase | Condition: Effect of size and sf | size = 1, sf = 2 |
| Staircase | Condition: Effect of size and sf | size = 1, sf = 4 |
| Staircase | Condition: Effect of size and sf | size = 0.5, sf = 2 |
| Staircase | Condition: Effect of size and sf | size = 0.5, sf = 4 |

Click on the arrow in front of the dataset entry to reveal the next level.



The third level of the results hierarchy displays the individual data collected during the session. The nature of the data is explicitly described by their titles.

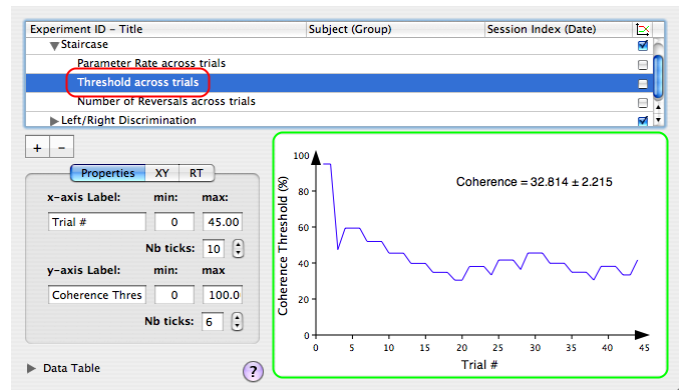
| Experiment ID - Title | Subject (Group) | Session Index (Date) |
|-----------------------------------|----------------------------------|----------------------|
| ▼ Staircase | Condition: Effect of size and sf | size = 1, sf = 2 |
| Index Trial across trials | | |
| Parameter Rate across trials | | |
| Threshold across trials | | |
| Number of Reversals across trials | | |

If you want to remove any data entry from the table (at any level of the hierarchy), select it and click on the '-' button. Note that the file that actually stores the data is neither deleted nor modified. Data can be added to the table again at any time with the '+' button.

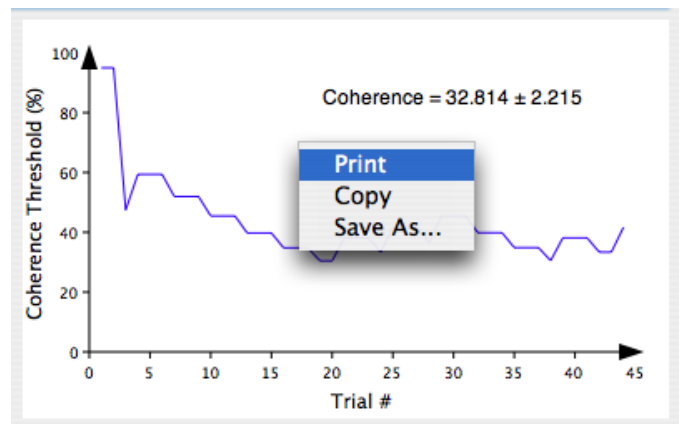
Step 2: Plotting the Data

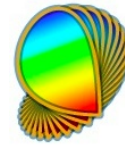
The selected data in the third level of the hierarchy described above is automatically plotted in the graphing view with the appropriate axes, labels, and legends.

Depending on the nature of the plotted dataset, it is possible to customize its graphing properties.



The graph can either be printed, copied, or saved by control-clicking on the graphing view. A copied graph can be pasted into any document that supports PDF. A saved graph is also in PDF format and can be edited in any application that supports PDF.





Step 3: Fitting the Data

For methods that do not already perform some sort of data analysis, their dataset can be fitted with a psychometric function selected in the **XY** or **RT** tab panel depending on the data type.

If appropriate data are plotted in the graphing view, changes made in the fitting parameters are automatically reflected in the graph.

If reaction times (RTs) are collected during a session, their distribution is represented as a histogram whose bin width can be specified here. The original RTs can also be filtered to discard values which are too short or too long before drawing and fitting the histogram. Optionally, the histogram can be fitted with a **Weibull distribution** and the post-stimulus RTs can be included in both the histogram and fit.

Properties **XY** RT

Fit With Psychometric Function:

Weibull

Direction: Increasing

Miss Rate (%): 2

Chance Level (%): 50

Threshold Criterion (%): 75

Properties XY **RT**

below 0.100 > Ignore RTs > 0.750 secs above

Include post-stimulus RTs

Bin Width: 50 ms

10 |-----| 100

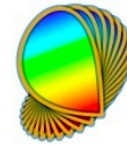
Fit With: Weibull Distribution

Step 4: Exporting the Data

Clicking on the small arrow in the bottom left-hand corner reveals a drawer with a table representation of the data. The data presented in this table depends on the selection in the hierarchical session table (1).

Selecting a session entry (1st level of the results hierarchy) shows a summary of the analysis performed on each dataset (typically thresholds and/or slopes as a function of the experimental condition). The result type is indicated by the "tab" title: in this example

| Condition | Variables | Mean | Std |
|-------------------|-----------|--------------------|-------------------|
| Spatial Frequency | sf = 4 | 0.4168898463249207 | 0.129597231745719 |
| Spatial Frequency | sf = 2 | 0.4719047546386719 | 0.244437813758850 |
| | | | |
| | | | |
| | | | |



thresholds were measured (as mean and std) for two experimental conditions to look at the effect of spatial frequency.

In this example, RTs were also collected and the statistics of their distribution reported as mean, median, and std for each type of response (hit & miss) including and excluding post-stimulus RTs ('All RTs' and 'Stimulus RT' extent, respectively).

| # Samples | Type | Extent | Mean | Median | Std |
|-----------|------|-------------|--------------|----------------|---------------|
| 7 | Hit | Stimulus RT | 0.4112878526 | 0.385502994060 | 0.09560193577 |
| 67 | Hit | All RT | 0.7865273294 | 0.697367012500 | 0.53501665737 |
| 12 | Miss | Stimulus RT | 0.4385936607 | 0.438713490962 | 0.05857469596 |
| 53 | Miss | All RT | 0.7475581888 | 0.664308011531 | 0.34484988532 |

This is an example of a data table obtained by selecting a dataset entry (2nd level of the results hierarchy): each data type collected during the session for a particular experimental condition appears as a column, with one row for each trial.

| Trial Index | Number of Reversals | Parameter Rate | Threshold |
|-------------|---------------------|----------------|-----------|
| 1 | 0 | 50 | 95 |
| 2 | 0 | 50 | 95 |
| 3 | 0 | 50 | 47.5 |
| 4 | 1 | 12.5 | 59.375 |
| 5 | 1 | 12.5 | 59.375 |
| 6 | 1 | 12.5 | 59.375 |
| 7 | 1 | 12.5 | 51.953125 |
| 8 | 1 | 12.5 | 51.953125 |

By control-clicking inside the table, presented data can either be printed, exported to a tabulated text file, or opened in *Excel* or *Numbers* applications for further analysis.

| sf | size | Threshold Mean | Threshold Std |
|-------|-------|----------------|---------------|
| 2.000 | 1.000 | 0.008 | 0.002 |
| 4.000 | 1.000 | 0.363 | 0.113 |
| 2.000 | 4.000 | 0.100 | 0.015 |
| 4.000 | 4.000 | 0.211 | 0.030 |

Conclusion

In this tutorial, you learned how to import and inspect previously collected session data, plot them with their fitting function, and export them in various forms.