Analyzing Data Graphically

In this lesson, you'll open a database containing information about the sleep habits of a group of students. You'll learn to do the following:

- Start InspireData
- Open a database
- Quick introduction to Table View
- Switch to Plot View
- Show and change icon labels
- View record details
- Create a Venn plot
- Add a Venn loop
- Add color to further represent meaning
- Increase text size for elements in Plot View
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- Create an Axis plot
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Start InspireData

To start InspireData on a computer running Windows:

- Click the **Start** button, point to **Programs** and click **InspireData.**

The InspireData Starter screen opens.

To start InspireData on a Macintosh computer:

- Open the **InspireData** folder from the location you installed it (ideally Applications), then double-click the **InspireData** icon.

The InspireData Starter screen opens.

Open a database

InspireData has more than 100 content-rich and template databases included. You'll begin the tutorial by opening one of the many available databases.

- Click the **Databases** button. Double-click the **More** folder, then open **Sleep Survey.**
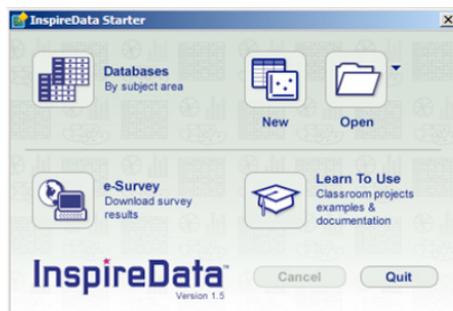
The Sleep Survey database opens in Table View.

Quick introduction to Table View

A table consists of fields (columns) and records (rows).

The table for the example database shown below contains information about the sleep and morning habits of a group of students. Each record represents the sleep habits of a single student. (Names here have been replaced by letter codes to protect anonymity.)

Field

Student	Age	Gender	Hours Sleep	Wake Process	How Do You Wake Up?	Breakfast
A	14	F	09:00	easy	naturally	medium
B	12	F	08:30	easy	naturally	small
C	15	M	08:00	so-so	person	small
D	17	F	07:15	easy	alarm	small
E	17	M	07:30	hard	alarm	large
F	13	F	09:30	easy	naturally	large
G	11	M	08:30	so-so	person	medium
H	16	M	08:40	so-so	person	medium
I	16	M	07:30	hard	alarm	none
J	11	M	09:15	easy	naturally	none
K	16	F	06:40	hard	alarm	none
L	11	F	08:00	so-so	alarm	small
M	15	M	07:15	hard	alarm	medium

Record

The fields in the table show data that was collected about the students. The example contains numeric data (age and hours of sleep) and text data (student, gender, ease of wake process, how a student wakes up and what size breakfast they eat).

You will learn more about adding records, creating fields and importing data into a table in a later lesson. Now it's time to see how Table View and Plot View are integrated by exploring the data from our sample database in Plot View.

Switch to Plot View

In Plot View you can visually analyze data.
- To view your data in Plot View, click the **Plot View** button on the **Toolbar**.
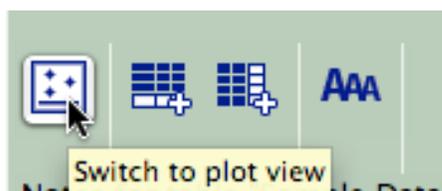
Switch to plot view

The icons you see below represent each record from the Sleep Survey table. The first time you switch from Table View to Plot View, icons are plotted freely and are moveable. Using Inspire-Data's plotting tools, you can arrange the icons in many informative ways.

Here's what the data looks like now:
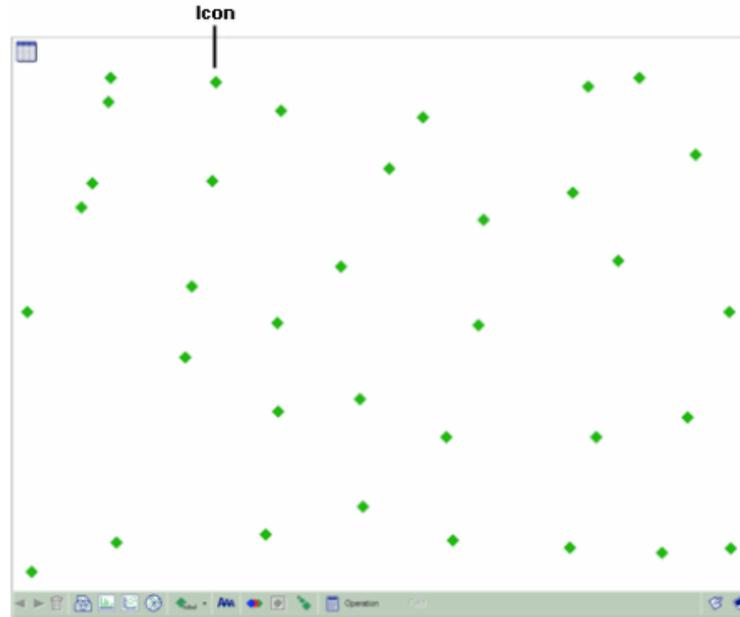
Show and change icon labels

Labels help you identify the icons. You can choose the values from any of the fields in your database as labels.

1. On the **Toolbar**, click the **Label** button to turn on labels.

2. Experiment by choosing different fields to use for a label. Click the **Label Options** button on the **Toolbar** .

The Label Options menu appears displaying a list of the field names from Table View.
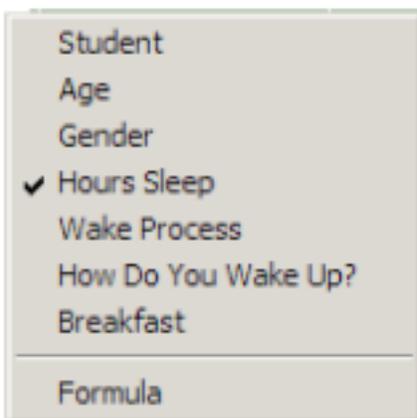
3. Select the field you want to display and see what happens to your plot.

4. Click the **Label** button again to turn the labels off.

View record details

Each icon represents one record in the database.

- Double-click on an icon.

A window displaying all of the data for that record will appear.

Record "D"	
Student	D
Age	17
Gender	**F**
Hours Sleep	07:15
Wake Process	easy
How Do You Wake Up?	alarm
Breakfast	small

Create a Venn plot

With Venn plots you can compare and analyze relationships between sets of data.

InspireData lets you create Venn plots with up to three loops.

1. On the **Toolbar**, click the **Venn Plot** button .

   A Venn loop appears with Field = 1 in the corner of the loop. Use this equation to define which icons you want in the loop.
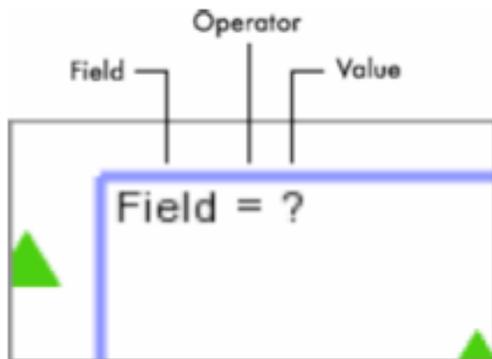
2. Click on the word **Field** and select **Hours Sleep** from the menu that appears.
3. Click on the **Operator**, which is currently an equals sign (=), then select **<** from the menu that appears.
4. Click on the **question mark**. Type **8:00** into the dialog, then click the **Accept** button (or simply hit *Return*).

Only those icons meeting the criteria—fewer than 8 hours sleep per night—now appear inside the loop.

Add a Venn loop

Now you'll add a second Venn loop.

1. In the lower left corner of the workspace, click the **Add Loop** button .

2. In the equation, click on the word **Field**. Select **Wake Process**.

3. Click on the **operator**. Select **=**.

4. Click on the **question mark**. Select **hard**.

Records are sorted into multiple categories. Where the two loops overlap, you can see that the students who get fewer than 8 hours of sleep have a harder time waking up. Students who do not match the characteristics you have set (in this case, the students who get more than 8 hours of sleep **and** don't have a hard time waking up) remain outside of both loops.

Here's what the data looks like now:

Add Loop
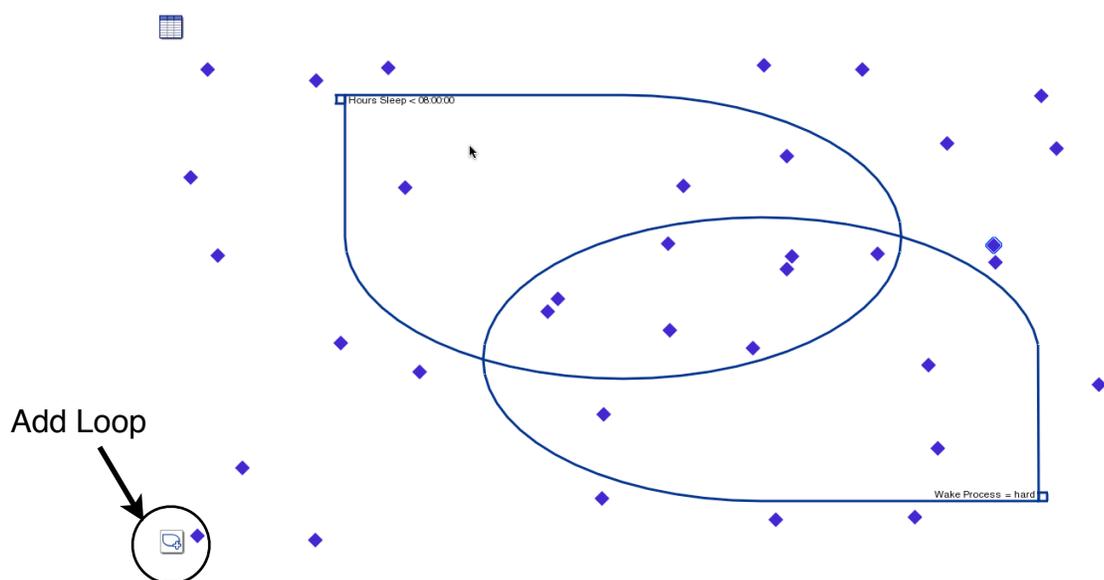
Add color to further represent meaning

Color adds another layer of visual detail and meaning to your plot. Choose any field in your plot to use as a basis for coloring. Colors are assigned to your icons based on the values in the field you select.

- On the **Toolbar**, click the **Color by Field** button and select **Gender**.

At the top of the plot, a legend shows how colors have been assigned to the values.

Gender: ☐ male   ☐ female

The icons of the boys are yellow; the icons of the girls are purple.

Increase text size for elements in Plot View

Use the Text Size control button in the Toolbar to increase the size of the text in notes and for elements in your plot. Increasing the text size is especially useful when you are working in a group around a computer monitor or when using a projector.

1. On the **Toolbar**, click the **Text Size** button ![AAA] .

2. Experiment with each of the three text size settings provided to see which one works best for your plot.

Capture a Slide for a Slideshow Presentation

You can save copies of various plots for use in a presentation that shows examples of your graphical analysis. Go to the **Slideshow** menu, and select **Capture Slide**, and the current plot will be added to your slideshow sorter. To view your slideshow, click the Slideshow Sorter icon at the far right end of the Toolbar.

Create a Stack plot

A Stack plot divides the values within one field into categories, then organizes the icons that fall into each category into stacks. The more records in a category, the higher the stack.

Stack plots are useful for showing how many records share a particular characteristic.

1. On the **Toolbar**, click the **Stack Plot** button ![icon] .

When you first switch to Stack plot mode, the icons are arranged into one tall stack. Once you assign a field to the axis, the icons will move into separate stacks based on their values.

2. On the workspace, click the **Axis label** of the X axis and select **Hours Sleep**.
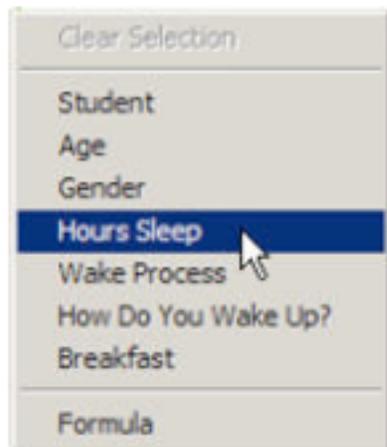
Use the numbers on the left side of the plot to help count the icons in each stack.

Here's what the data looks like now.
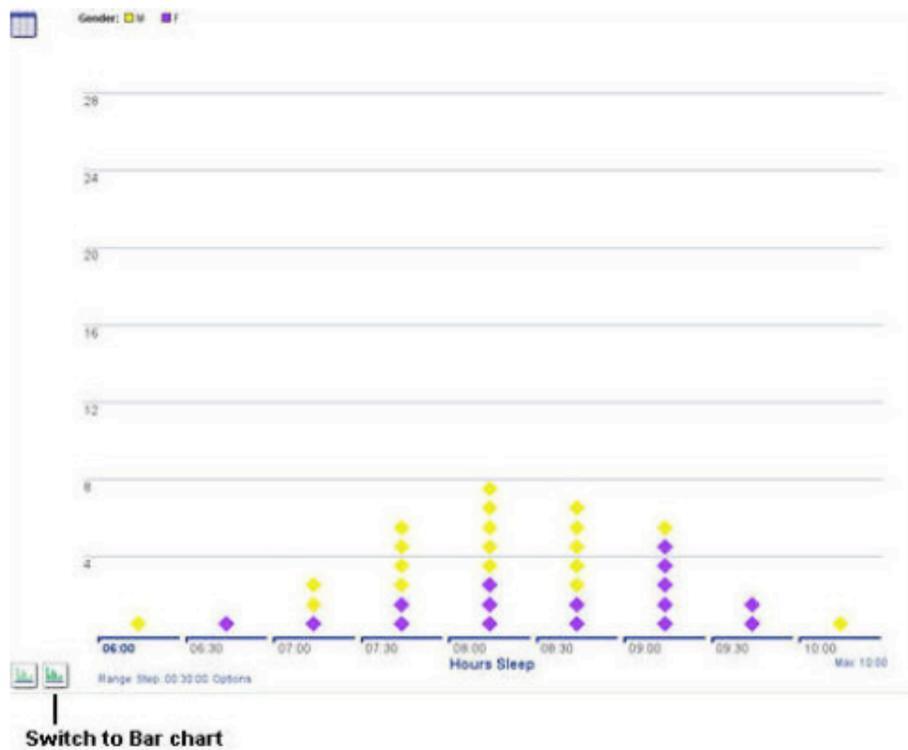
Switch to Bar chart

You may switch to a Bar chart by clicking the **Bar chart** button in the lower left-hand corner of the workspace.

Create a parallel Stack plot

You can divide your Stack plot using different characteristics. To see the relationship between the length of time a student sleeps and the wake process, for example, you could use a parallel Stack plot.

1. On the lower-left corner of the workspace, click the **Plot Options** button ![icon], then select

    the **horizontal parallel stack** option ![icon] .

    A Y axis appears on the left side of your stack plot.

2. Click the **Y Axis** label and select **Wake Process**.

The pattern shows that the fewer hours a student sleeps, the harder it is to wake up.

Since the icons representing male students are now yellow and the icons representing female students are purple, we can quickly see that boys find it harder to wake up after getting fewer hours of sleep than girls do.

Show the mean for each level

Now that you have two distinct ranges of data you can display the average or mean which, in this case, would be the average or mean hours of sleep for each group.

- Click the **Options** button next to the X axis near the lower-left side of the workspace, then select Show Mean.

☑ Capture this plot into your slideshow as you did previously (see p. 6), or, if the sorter is visible, you can click the "camera" icon at the bottom of the sorter to capture a slide.

Create an Axis plot

Axis plots let you create scatterplots, which are a great way to find and investigate correlations. For example, you could see if there was a relationship between amount of sleep and age.

1. On the Toolbar, click the Axis Plot button ⬚.

   The icons won't move until you assign fields to the X and Y axes.

2. Click the **X Axis** label and select **Hours Sleep**.

3. Click the **Y Axis** label and select **Age**.

   The plot shows that older students tend to get less sleep than younger students.
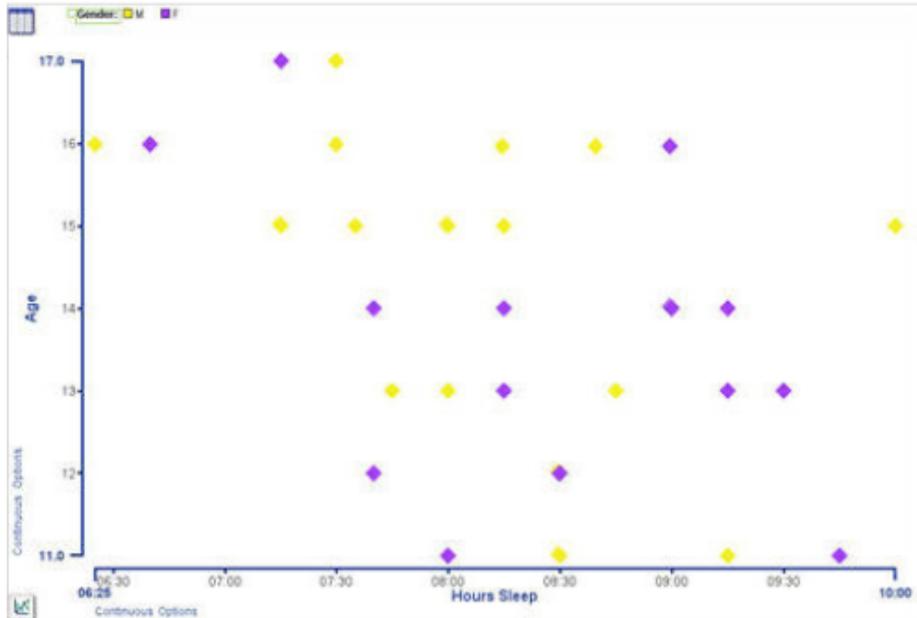
When you create an Axis plot where both axes are numeric and continuous data, you can display the Line of Best Fit, as shown below, or a Line Graph. To do either one, click the button in the lower left corner of the workspace.
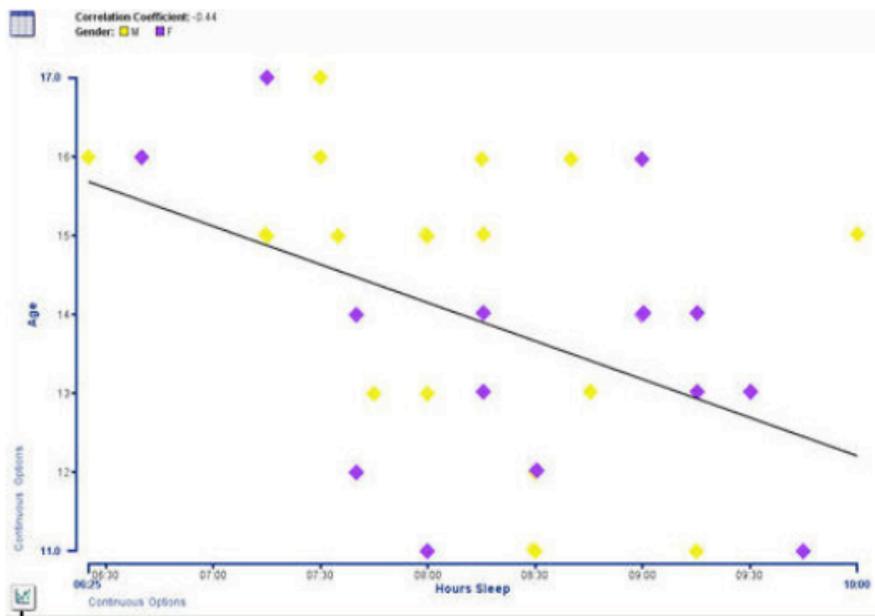
Click to display Line of Best Fit or Line Graph

Mark items of interest

Some icons might have the highest or lowest values for a particular field or seem to defy the general trend. You can mark these icons and track them through your plots.

For example, in this plot you can see that one student gets a lot of sleep compared to others his own age.

1. Click on the icon of the student who seems to get more sleep than others in his age group.

2. On the **Toolbar**, click the **Mark** button.
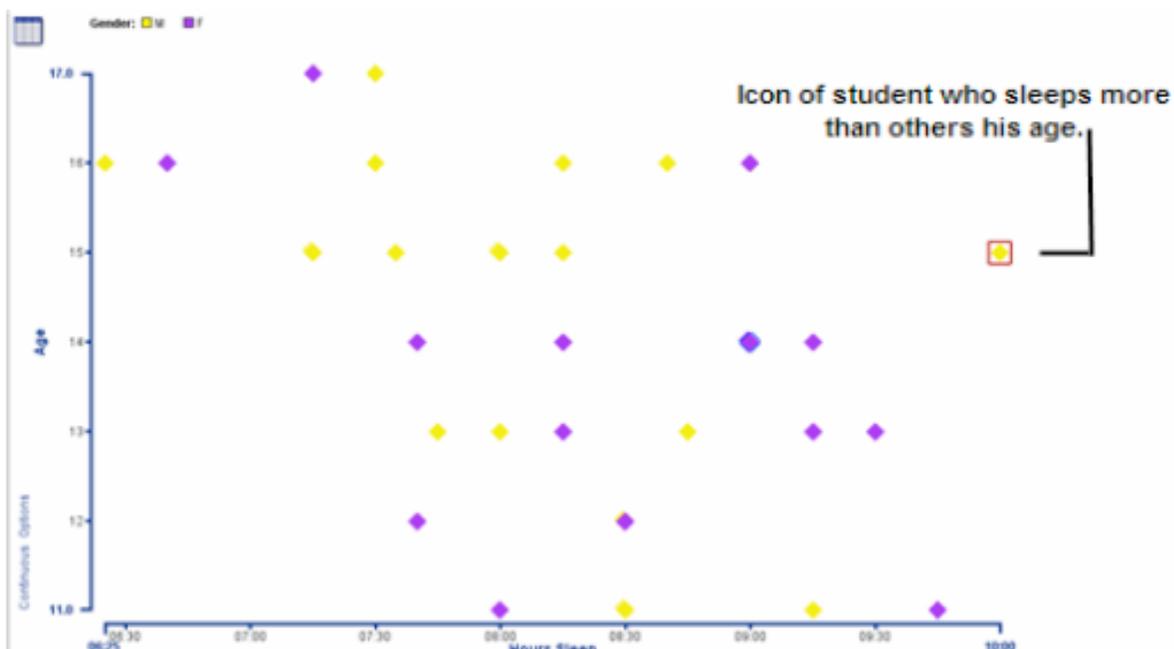
Since the icon is now marked with a box, you can easily identify and track it as you make changes to the plot.

☑ Capture this plot into your slideshow.

Create a Pie plot

Pie plots show how many records in your table share a common attribute. The pie's sections are determined by the values in the field you assign to the pie, and the icons fall accordingly into these sections. The higher the number of records in a section, the larger the pie section is.

1. On the **Toolbar**, click the **Pie Plo**t button .

    There aren't any sections because you haven't assigned a field to the pie yet.

2. Click the **Select Field** button above the circle, then select **Wake Process**.

The plot is now divided into sections. The icons are rearranged.

Here's what your data looks like now.
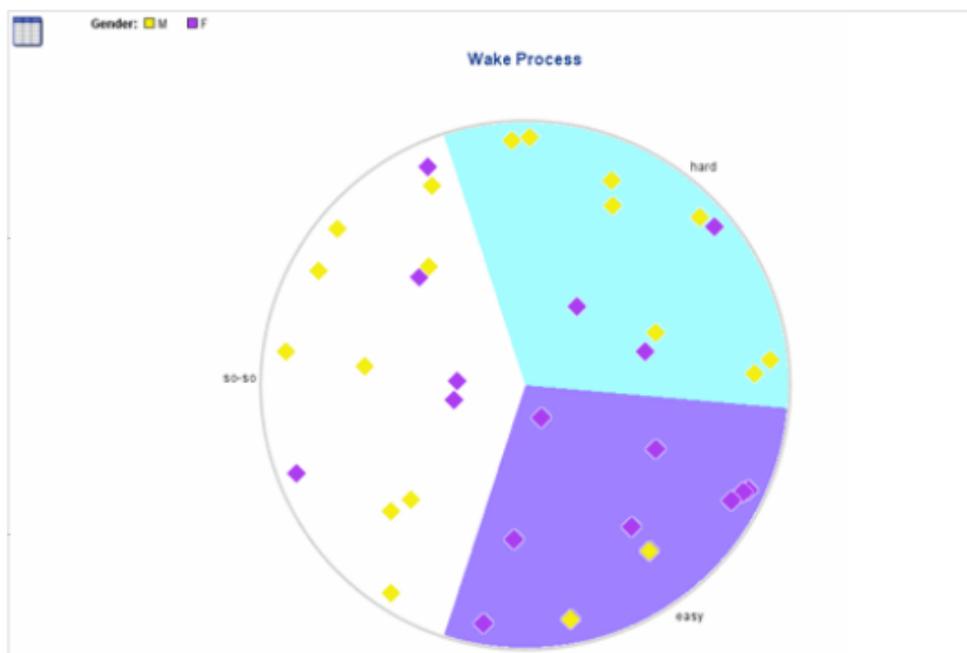
Subdivide a Pie plot

You can split your icons into multiple pies, which you can compare side-by-side. For example, if you wanted to see if there was a significant difference between males and females regarding ease in waking up, you could move the males into one pie and the females in another.

1. On the lower-left corner of the workspace, click the **Plot Options** button, then select the

    multiple horizontal pies option ⊗⊗.

    An X axis appears beneath the pie.

2. Click the X Axis label and select Gender.

Plot Options
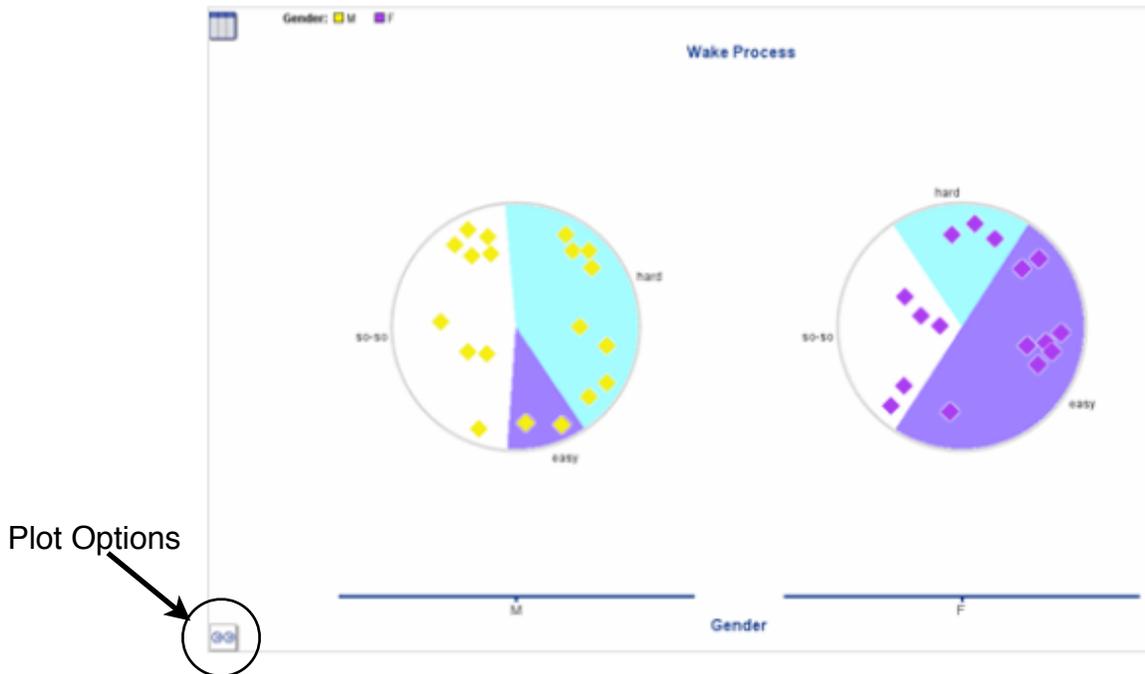
There is an appreciable difference in ease in waking up between males and females. A higher percentage of boys report that waking up is hard for them.

☑ Capture this plot into your slideshow.

Save a document

Save your document on a regular basis. To save a document for the first time, or to save a document you've already saved using the current file name, use the Save command.

1. On the **File** menu, choose **Save**.

2. If necessary, navigate to the folder in which you want to save the document.

3. Click the **Save** button.

Give it a name, such as *My Sleep Survey*, in order to find it easily.

Note: All InspireData documents are automatically saved with an .IDF extension.

Source: InspireData Users Manual©, Chapter 2