Data Visualization (DataVis)
## FAQs: Creating New Variables/Data

Frequently asked questions related to the creation of new variables and data in DataVis.

1. How to create a new variable?

Currently, users have the option to exclusively create Y-variables within the software by navigating to the Data toolbox and clicking the addition symbol (+) adjacent to "Create Data." Subsequently, select the "Create new" tab, which will offer the choice of generating a new Y variable or forming new data sets (see Fig. 1).

Figure 1: Creating new variable.
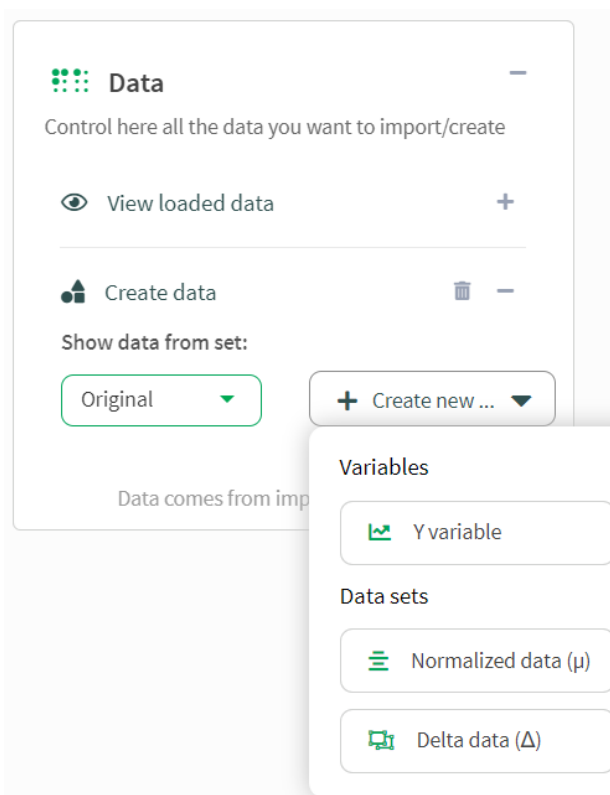
By choosing "Create Y variable," a new pop-up window named "Create new variable" will appear. This functionality allows you to generate a personalized Y-variable, which involves combining existing variables and constants using a mathematical formula of your preference (see Fig. 2.).

Figure 2: Create new variable dialogue window.

*TIP: When working with equations that include constants, remember to press the Enter key on your keyboard after adding each constant in the input area to transfer it to the build area.*

As you construct the equation, a new table bearing the name of your recently created variable will be generated in the results section. Subsequently, this variable will be plotted once you select the "create variable" button.

2. How to create new data (normalized data or delta data)?

Before attempting to create normalized or delta data, make sure at least one of the following are fulfilled (1) you annotated segments in your zpt file(s) and/or (2) have at least two different zpt files in your project. If neither of these is true. You will see something like this (Fig. 3.):

Figure 3. "No annotation detected" warning message and suggested resolution.
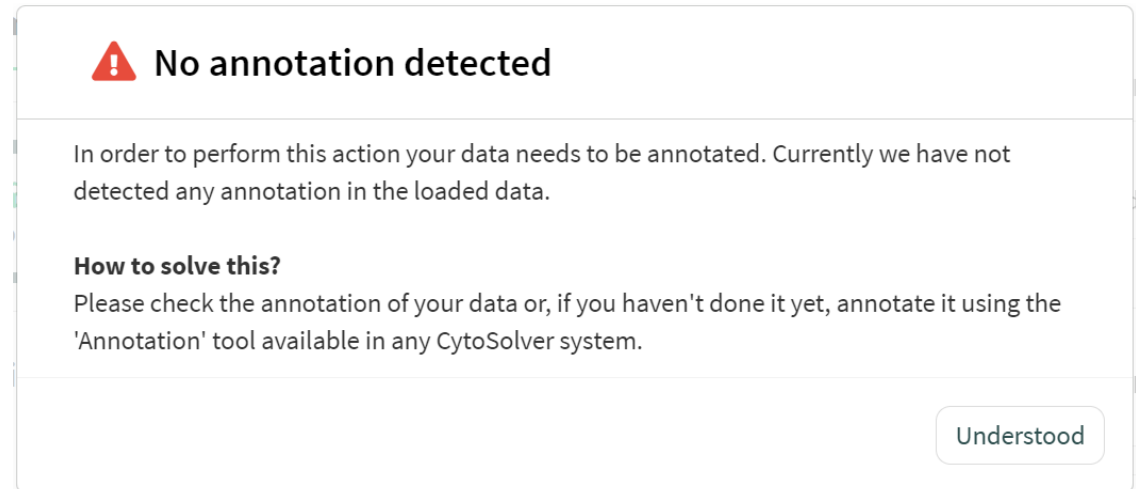
Assuming that your files are fulfilling above mentioned criteria, users have the option of *creating normalized data* or *creating delta data*. Similar to creating Y variable, users will follow the path: Data toolbox > create data > create new > select one of two options for creating data sets from drop down menu.

Calculating value normalizations (a.k.a norms):

With this feature, you can create a 'normalized' (**μ**) data set by normalizing a variable. The new data set will use your original data set, imported from the transient analysis page, as a reference point. *Remember: data needs to be annotated to carry out this procedure, and the formula will be applied to all variables present in the original data set.*

Depending on your preferences, it will perform a <u>division operation</u> by dividing rows labeled with a tag chosen under 'targets' by average values of rows labeled with a tag selected under 'baseline'.

Steps:
1.   Select "Normalized data" from the drop-down menu under "Data sets". This will open a new pop-up window "Calculate time-based normalization".

2. How to create new data (normalized data or delta data)? (cont.)

Steps (cont.):

2.   Select a name that will serve as an identifier for your new dataset. This name will be accompanied by an internal ID that will appear just before it, creating a format like this: [ID: Your_data_set_name].

3.   Select a baseline and targets for division. In this example, we chose to normalize data based on treatment conditions and use "control" as our average for normalization (see Fig. 4.).

Figure 4. Example value normalization.

4.   Choose an algorithm to calculate the average of 'baseline' rows, two algorithms are available:
   a.   Average of all baselines: calculates average of cells annotated as baseline, and subtracts the value to all cells annotated with target (including baseline).
   b.   Average of closest baseline in time: groups each target-annotated cell with its closest baseline in time. Then, the average of each group's baseline is subtracted from the rest of the group (including itself)

5.   Calculate results and preview your new dataset before saving it.

6.   Close or save your data.

2. How to create new data (normalized data or delta data)? (cont.)

Calculating value normalizations (a.k.a norms):
With this feature, you can create a 'delta' (**Δ**) data set that represents a variable's change over time. The new data set will utilize your original data set, imported from the transient analysis page, as a reference point.
Remember: To carry out this procedure, data needs to be annotated with at least 2 factors, and the formula will be applied to all variables present in the original data set.

Depending on your preferences, it will perform a <u>subtraction operation</u> by subtracting average values of rows labeled with a tag chosen under 'baseline' from rows labeled with a tag chosen under 'targets'.

Steps:
1.   Select "Delta Data" from the drop-down menu under "Data sets". This will open "Calculate deltas" pop-up window.

2.   Choose a name to identify your new data. The dataset will receive an internal ID, which will be displayed as [ID: Your_data_set_name].

3.   Select a baseline to be subtracted from targets.

4.   Choose an algorithm to calculate the average of 'baseline' rows. Three algorithms are available:

   a.   True repeated measurements, subtracts baseline to target only for cells that have true repeated measurements.

   b.   Average of all baselines, - *used in this example* - calculates the average of cells annotated as baseline, and subtracts the value to all cells annotated with target (including baseline).

   c.   Average of closest baseline in time: groups each target-annotated cell with its closest baseline in time. Then, the average of each group's baseline is subtracted to the rest of the group (including itself) (see Fig. 5.)

Figure 5. Example delta data.

2. How to create new data (normalized data or delta data)? (cont.)

Steps (cont.):

5.   Calculate results and preview your new dataset before saving it.

6.   Close or save your data.

3. Where can created data/variables be found on (DataVis)?

The location of the data depends on its type:

• If you generated a Y-variable, it will be accessible in the plotting toolbox by selecting the Y-axis drop-down menu.

• If you created a new dataset, such as normalized or delta data, it can be found in the data toolbox under "Create Data" and "Show data from set" drop-down menu.

4. When generated, does the newly created data (normalized or delta data) automatically populate on the graphs in DataVis?

The newly generated data will not appear on the graphs automatically. You need to manually choose the data from the "Show data from set" drop-down menu, located in the "Create Data" section of the data toolbox.

Hanan Qasim, Ph.D.
IonOptix
Email: info@ionoptix.com
Web: www.ionoptix.com