

SSD FOR R QUICK FUNCTIONS GUIDE

Basic Functions

Open/Import .csv file

Description: This function opens “.csv” file created in Excel.

Command: **Getcsv()**

Ex: **Getcsv()**

List all functions

Description: List all functions available in *SSD for R*.

Command: **SSDforR()**

Ex: **SSDforR()**

List variables

Description: Lists all variables in active data frame.

Command: **listnames()**

Ex: **listnames()**

Save a data file

Description: Save a data file edited in *SSD for R* as “.csv” file.

Command: **Savecsv()**

Ex: **Savecsv()**

Graphing Functions

Create a line graph

Description: This function builds a simple line chart for a given behavior across all phases. A space separates each phase.

Command: **ABplot(behavior, phaseX, ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **ABplot(yell, pyell, “school days”, “yelling incidents”, “Jenny’s Yelling”)**

Create multiple line graphs in a single window

Description: This function builds a simple line chart for a given behavior across all phases. A space separates each phase. This function needs to be invoked for each graph separately. **plotnum()** must precede use of this function.

Command: **ABplotm(behavior, phaseX, ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **ABplotm(yell, pyell, "school days", "yelling incidents", "Jenny's Yelling")**

Create multiple line graphs in a single window

Description: This function builds simple line charts for a given behavior across all phases. A space separates each phase. This function needs to be invoked for each graph separately. **plotnum()** must precede use of this function.

Command: **ABplotm(behavior, phaseX, ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **ABplotm(yell, pyell, "school days", "yelling incidents", "Jenny's Yelling")**

Sets the graphic environment when creating multiple line graphs

Description: This function specifies the number of rows and columns to display in the graphics window when multiple line graphs are to be built.

Command: **plotnum(nr, nc)**

nr: number of rows desired

nc: number of columns desired

Ex: **plotnum(4,2)**

Draw a solid line between phases on a graph

Description: This function enables the user to draw solid vertical lines between phases on a graph. Once the function is invoked, the user is prompted to accept the line or not.

Command: **ABlines(behavior)**

behavior: behavior variable

Ex: **ABlines(yell)**

Draw a dashed line between phases on a graph

Description: This function enables the user to draw dashed vertical lines between phases on a graph. Once the function is invoked, the user is prompted to accept the line or not.

Command: **ABlineD(*behavior*)**

behavior: behavior variable

Ex: **ABlineD(yell)**

Label a graph

Description: This function enables the user to write text on a graph. Users have three options for doing this: text with neither subscripts nor superscripts, text with superscripts, and text with subscripts. Commands for each and examples are displayed below. After the command is invoked, users will be prompted to place the cursor where the text is to begin. After text is placed, users will be prompted to choose whether or not to accept the graph with the text.

Command: (for text with neither subscripts nor superscripts)

ABtext()

Text to be entered on graph must appear between quotation marks

Ex: **ABtext("baseline")**

Command: (for text with superscripts)

ABtext(expression(*text*^{*superscript*}))

text: this is the text that is to be displayed on the graph

superscript: this is the actual superscript that is to be displayed

Ex: **ABtext(expression(X²))**

Command: (for text with subscripts) **ABtext(expression(*text*_{*subscript*}))**

text: this is the text that is to be displayed on the graph

subscript: this is the actual subscript that is to be displayed

Ex: **ABtext(expression(B₁))**

Draw an arrow on a graph

Description: This function enables users to draw an arrow on a graph. For example, an arrow can be drawn from a text label of a critical event to a point on the graph. Once the function is invoked, the user is prompted to accept the arrow or not.

Command: **ABarrow()**

Ex: **ABarrow()**

Adding statistical lines (mean, median or sd) to an **ABplot**

Description: This function enables users to draw a line in a phase representing the mean, median or standard deviation.

Command: **ABstat(behavior, phaseX, v, statX)**

behavior: behavior variable

phaseX: phase variable

v: phase letter entered between quotes (e.g., "A", "B")

statX: mean, median or sd written between quotation marks (e.g., "mean")

Ex: **ABstat(yell, pyell, "A", "mean")**

Adding trimmed mean line to an **ABplot**.

Description: This function enables a user to add a line representing the trimmed mean to any phase of an **ABplot**

Command: **Trimline(behavior, phaseX, v)**

behavior: behavior variable

phaseX: phase variable

v: phase letter entered between quotes (e.g., "A", "B")

Ex: **Trimline(yell,pyell,"B")**

Adding standard deviation (SD) bands line an **ABplot**.

Description: This function enables a user to add a line representing the SD bands (± 1 , ± 2 , or ± 3) to any phase of an **ABplot**

Command: **SDAband(behavior, phaseX, v, bandX)**

behavior: behavior variable

phaseX: phase variable

v: phase letter entered between quotes (e.g., "A", "B")

bandX: SDordinate 1, 2 or 3

Ex: **SDAband(yell,pyell,"A",2)**

Adding interquartile range (iqr) line to an **ABplot**.

Description: This function enables a user to add a line representing the Interquartile range to any phase of an **ABplot**

Command: **IQRline(behavior, phaseX, v)**

behavior: behavior variable

phaseX: phase variable

v: phase letter entered between quotes (e.g., "A", "B")

Ex: **IQRline(yell,pyell,"A")**

Create a ± 1 standard deviation (sd) band graph for a given phase

Description: This function builds a ± 1 standard deviation band graph for a given behavior based upon a phase of the user's choice. A space separates each phase.

Command: **sd1bandgraph(behavior, phaseX, v1, ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable

v1: phase letter entered between quotes (e.g., "A", "B")

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **sd1bandgraph(yell, pyell, "A", "school days", "yelling incidents", "SD graph: Jenny's Yelling")**

Create a ± 1 standard deviation (sd) band graph across all phases

Description: This function builds a ± 1 standard deviation band graph for a given behavior across all phases. A space separates each phase.

Command: **SD1(behavior, phaseX, v1, ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable

v1: phase letter entered between quotes (e.g., "A", "B")

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **SD1(yell, pyell, "A", "school days", "yelling incidents", "SD graph: Jenny's Yelling")**

Places legend at bottom of one standard deviation (SD1) band graph

Description: This function enables the user to place legend on a graph. NOTE: Once this legend is in place, the graph can no longer be altered.

Command: **SD1legend()**

Ex: **SD1legend()**

Create a ± 2 standard deviation (sd) band graph for a given phase

Description: This function builds a ± 2 standard deviation band graph for a given behavior based upon a phase of the user's choice. A space separates each phase.

Command: **sd2bandgraph(behavior, phaseX, v1, ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable

v1: phase letter entered between quotes (e.g., "A", "B")

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **sd2bandgraph(yell, pyell, "A", "school days", "yelling incidents", "SD graph: Jenny's Yelling")**

Create a ± 2 standard deviation (sd) band graph across all phases

Description: This function builds a ± 2 standard deviation band graph for a given behavior across all phases. A space separates each phase.

Command: **SD2(behavior, phaseX, v1, ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable

v1: phase letter entered between quotes (e.g., "A", "B")

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **SD2(yell, pyell, "A", "school days", "yelling incidents", "SD graph: Jenny's Yelling")**

Places legend at bottom of two standard deviation (SD2) band graph

Description: This function enables the user to place legend on the graph

NOTE: Once this legend is in place, the graph can no longer be altered.

Command: **SD2legend()**

Ex: **SD2legend()**

Create an interquartile (iqr) band graph for a single phase

Description: This function builds an iqr band graph for a given behavior based upon a phase of the user's choice. The graph will only be drawn for the phase selected. Statistical output in the Console shows the interquartile bands.

Command: **IQRbandgraph(behavior, phaseX, v1, ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable

v1: phase letter entered between quotes (e.g., "A", "B")

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **IQRbandgraph(yell, pyell, "A", "school days", "yelling incidents", "SD graph: Jenny's Yelling")**

Create an interquartile (iqr) band graph through all phases

Description: This function builds an iqr band graph for a given behavior based upon a phase of the user's choice. The graph will be drawn for all phases. A space separates phases. Statistical output in the Console shows the interquartile bands.

Command: **ABiqr(behavior, phaseX, v1, ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable

v1: phase label entered between quotes ("A", "B", "B1")

ABxlab: label for x-axis written between quotation marks

ABylab: label for y-axis written between quotation marks

ABmain: main label for graph between quotation marks

Ex: **ABiqr(cry, pcry, "A", "school days", "yelling incidents", "SD graph: Jenny's Crying")**

Places legend at bottom of **IQRbandgraph** or **ABiqr** band graph

Description: This function enables the user to place legend on a graph.

NOTE: Once this legend is in place, the graph can no longer be altered.

Command: **IQRlegend()**

Ex: **IQRlegend()**

Create a time series line graph

Description: This function builds time series chart for a given behavior across all phases. A space separates each phase. There are no connecting dots.

Command: **ABtsplot(behavior, phaseX, ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; between quotation marks

Ex: **ABtsplot(yell, pyell, "school days", "yelling incidents", "Jenny's Yelling")**

Basic Statistical Analysis

Compute descriptive statistics for any phase

Description: This function produces descriptive statistics for all phases. Statistics produced are: mean, 10% trimmed mean, median, standard deviation (sd), coefficient of variation (CV), range, interquartile range, and quantiles. Graphical output for this function is a boxplot of data in each phase.

Command: **ABdescrip(behavior, phaseX)**

behavior: behavior variable

phaseX: phase variable on which test is based

Ex: **ABdescrip(yell, pyell)**

OLS regression for a single phase

Description: Conducts OLS regression for any phase. Coefficients and residuals are produced. Also a simple line graph for the specified phase with a regression line is displayed in the graph window.

Command: **Aregres(behavior, phaseX, v1)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

Ex: **Aregres(cry, pcry, "A")**

Robust regression for a single phase

Description: Conducts robust regression for any phase. Coefficients and residuals are produced. Also a simple line graph for the specified phase with a regression line is displayed in the graph window.

Command: **Arobust (behavior, phaseX, v1)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

Ex: **Arobust(cry, pcry, "A")**

OLS regression to compare phases

Description: Conducts OLS regression comparing any two phases. Coefficients and residuals are produced for each phase. Also a graph with a regression line is displayed for each phase in the graph window.

Command: **ABregres (behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **ABregres(cry, pcry, "A", "B")**

Robust regression to compare phases

Description: Conducts robust regression comparing any two phases. Coefficients and residuals are produced for each phase. Also a graph with a robust regression line is displayed for each phase in the graph window.

Command: **ABrobust (behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **ABrobust(cry, pcry, "A", "B")**

Effect Size Functions

Calculates most common effect size indices

Description: Displays the percent change and calculated values for both the ES and d-index for any two phases. Information for interpreting calculated values appears in the Console.

Command: **Effectsize(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **Effectsize(cry, pcry, "A", "B")**

Calculates g-index

Description: Calculates effect size based on scores in the desired zone.

Command: **Gindex(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **Gindex(cry, pcry,"A", "B")**

Calculation of Improvement Rate Difference

Description: Calculates Improvement Rate Difference (IRD) and displays a graph. The user will be prompted to enter a value for a reference line, identify the number of intervention points remaining and number of baseline data points that would need to be removed in order to eliminate all overlap or ties between phases.

Command: **IRD(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **IRD(cry, pcry,"A", "B")**

Calculation of Percentage of All Non-Overlapping Data above the reference line

Description: This function evaluates the percentage of all non-overlapping data (PAND) above the reference line in the comparison phase. Users will be prompted to enter a value for the reference line.

Command: **PANDabove(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **PANDabove(cry, pcry,"A", "B")**

Calculation of Percentage of All Non-Overlapping Data below the reference line

Description: This function evaluates the percentage of all non-overlapping data (PAND) below the reference line in the comparison phase. Users will be prompted to enter a value for the reference line.

Command: **PANDbelow(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **PANDbelow(cry, pcry,"A", "B")**

Create a legend on a PAND graph

Description: Adds a legend to PAND graph. The graph can not be modified in any way after the legend is added.

Command: **PANDlegend()**

Ex: **PANDlegend()**

Calculation of Percentage of Data Exceeding the Median above the median

Description: The Percentage of Data Exceeding the Median (PEM) procedure offers a method to assess effect size and adjust for the influence of outliers in the baseline phase when desired values are above the reference line.

Command: **PEMabove(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **PEMabove(cry, pcry, "A", "B")**

Calculation of Percentage of Data Exceeding the Median below the median

Description: The Percentage of Data Exceeding the Median (PEM) procedure offers a method to assess effect size and adjust for the influence of outliers in the baseline phase when desired values are below the reference line.

Command: **PEMbelow(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **PEMbelow(cry, pcry, "A", "B")**

Create a legend on a PEM graph

Description: Adds a legend to PEM graph. The graph can not be modified in any way after the legend is added.

Command: **PEMlegend()**

Ex: **PEMlegend()**

Calculation of Percentage of Non-Overlapping Data above the reference line

Description: The Percentage of Non-Overlapping Data (PND) procedure offers a method to assess effect size based upon the highest data point in the comparison phase.

Command: **PNDabove(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **PNDabove(cry, pcry, "A", "B")**

Calculation of Percentage of Non-Overlapping Data below the reference line

Description: The Percentage of Non-Overlapping Data (PND) procedure offers a method to assess effect size based upon the lowest data point in the comparison phase.

Command: **PNDbelow(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **PNDbelow(cry, pcry, "A", "B")**

Create a legend on a PND graph

Description: Adds a legend to PND graph. The graph can not be modified in any way after the legend is added.

Command: **PNDlegend()**

Ex: **PNDlegend()**

Statistical Process Control (SPC) Charts

Create an X-bar-Range-Chart (X-R-Chart)

Description: This function builds an X-R-Chart using range. A space separates each phase. Used with multiple observations per sample. In the example below, there are 7 observations (days) per sample (weeks). The "admitweek" is the grouping variable. If there were 8 weeks, the values for this variable would range from 1 to 8 with seven observations for each. Values for the Uband, mean, and Lband appear as statistical output in the Console.

Command: **XRchart(behavior, groupX, bandX, ABxlab, ABylab, ABmain)**

behavior: behavior variable

groupX: grouping variable

bandX: number of SDs desired (i.e., 1, 2, 3)

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **XRchart(admits, admitweek, 3, "weeks", "mean % of admits", "Social Admits")**

Create an R-chart using mean range

Description: This function builds an R-chart using the mean range. A space separates each phase. Used with multiple observations per sample. In the example below, there are 7 observations (days) per sample (weeks). The “admitweek” is the grouping variable. If there were 8 weeks, the values for this variable would range from 1 to 8 with seven observations for each. This version of the R-chart is recommended when the sample size is small (less than 10). It uses the mean range of the samples to track variation. Similar to the X-R-Chart, using the mean range improves confidence in the measure. Values for the Uband, mean, and Lband appear as statistical output in the Console.

Command: **Rchart (behavior, groupX, bandX, ABxlab, ABylab, ABmain)**

behavior: behavior variable

groupX: grouping variable

bandX: number of SDs desired (i.e., 1, 2, 3)

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **Rchart(admits, admitweek, 3,"weeks","mean range % of admits","Social Admits")**

Create an R-chart using standard deviation

Description: This function builds a R-chart using standard deviation. A space separates each phase. Used with multiple observations per sample. In the example below, there are 7 observations (days) per sample (weeks). The “admitweek” is the grouping variable. If there were 8 weeks, the values for this variable would range from 1 to 8 with seven observations for each. This version of the R-chart can be used with samples greater than ten. Values for the Uband, mean, and Lband appear as statistical output in the Console. *Command:*

Rchartsd (behavior, groupX, bandX, ABxlab, ABylab, ABmain)

behavior: behavior variable

groupX: grouping variable

bandX: number of SDs desired (i.e., 1, 2, 3)

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **Rchartsd (admits,admitweek, 3,"weeks","mean range % of admits","Social Admits")**

Create line on R-charts

Description: This function enables the user to draw solid vertical lines between phases on the SPC R-chart using standard deviation and R-Chart using mean range. The user clicks the mouse on a upper and lower y ordinate.

Command: **SPCline()**

Ex: **SPCline()**

Create a Proportion Chart (P-chart)

Description: This function builds a p-chart. A space separates each phase. Used with multiple observations per sample. The behavior variable must be binary. Values for the Uband, mean, and Lband appear as statistical output in the Console.

Command: **Pchart (behavior, groupX, bandX, ABxlab, ABylab, ABmain)**

behavior: behavior variable

groupX: grouping variable

bandX: number of SDs desired (i.e., 1, 2, 3)

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **Pchart(group, wgroup, 3, "weeks", "proportion of attendance", "Jenny's Group Attendance")**

Create an X-Moving-Range-Chart (X-mR-chart)

Description: This function builds an X-mR-chart and is used with individual data. A space separates each phase. The X-mR-chart can be used to detect changes within and between phases. This chart should not be used when there is a trend in the data. As with the previous charts, large unexpected change in the undesired zone (values above upper band or below the lower band) may indicate the need to modify the intervention. Values for the Uband, mean, and Lband appear as statistical output in the Console.

Command: **Xmrchart (behavior, phaseX, v1, bandX, ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable on which bands are based

v1: phase letter entered between quotes (e.g., "A", "B")

bandX: number of SDs desired (i.e., 1, 2, 3)

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **Xmrchart(esteem, pestem, "A", 3, "weeks", "mean self-esteem", "Jenny's Self-esteem")**

Create a C-Chart

Description: This function builds a c-chart and is used with individual (i.e., ungrouped) data. A space separates each phase. For use when the outcome variable is a count (i.e., ratio level) variable.

Command: **Cchart (behavior, phaseX, v1 ,bandX, ,ABxlab, ABylab, ABmain)**

behavior: behavior variable

phaseX: phase variable on which bands are based

v1: phase letter entered between quotes (e.g., "A", "B")

bandX: number of SDs desired (i.e., 1, 2, 3)

ABxlab: label for x-axis; written between quotation marks

ABylab: label for y-axis; written between quotation marks

ABmain: main label for graph; written between quotation marks

Ex: **Cchart(yell, pyell, "A", 3, "days", "Count", "Count of Yelling ")**

Places legend at bottom of any SPC band graph

Description: This function enables the user to place legend on a graph.

NOTE: Once this legend is in place, the graph can no longer be altered.

Command: **SPClegend()**

Ex: **SPClegend()**

Tests and Functions Related to Autocorrelation

Test for lag-1 autocorrelation

Description: This function tests for lag-1 autocorrelation. This should be used any time the sample size is less than six. Any phase can be tested. Also produces regression line graph.

Command: **ABrf2(behavior, phaseX, v1)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

Ex: **ABrf2(cry,pcry,"A")**

Test for autocorrelation for any lag

Description: This function tests for autocorrelation for any lag. Should be used with samples greater than or equal to six. Also produces significance graph for lags. The Box-Ljung test of significance is performed for all lags up to and including the specified one.

Command: **ABautoacf (behavior, phaseX, v, lags)**

behavior: behavior variable

phaseX: phase variable on which test is based

v: phase letter entered between quotes (e.g., "A", "B")

lags: number of lags to be tested

Ex: **ABautoacf(cry, pcry,"A", 3)**

Test for partial autocorrelation for any lag

Description: This function tests for partial autocorrelation for any lag. Should only be used with samples greater than or equal to six. Also produces significance graph for lags.

Command: **ABautopacf (behavior, phaseX, v, lags)**

behavior: behavior variable

phaseX: phase variable on which test is based

v: phase letter entered between quotes (e.g., "A", "B")

lags: number of lags to be tested

Ex: **ABautopacf (cry, pcry, "A", 3)**

First difference transformation

Description: This function produces a first difference transformation for any phase. The results can be saved for later use by answering "y" to the prompt to save results. A line graph is produced for the original and transformed data. Statistical output includes displaying first differencing data in the Console.

Command: **diffchart(behavior, phaseX, v1)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

Ex: **diffchart(cry, pcry, "A")**

Moving average transformation

Description: This function produces a moving average transformation for any phase with every two scores being averaged. The results can be saved for later use by answering "y" to the prompt to save results. A line graph is produced for the original and transformed data. Statistical output includes displaying moving average data in the Console.

Command: **ABma (behavior, phaseX, v1)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

Ex: **ABma (cry, pcry, "A")**

Differencing for ARIMA data

Description: This function produces a difference transformation for any phase and for any order of differencing. Two graphs are displayed: the original and the differenced behavior.

Command: **ABma (behavior, phaseX, v, d)**

behavior: behavior variable

phase: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

d: integer for order of difference

Ex: **Arimadiff (cry, pcry, "A", 2)**

Moving average for ARIMA data

Description: This function produces a difference transformation for any phase and for any order of differencing. Two graphs are displayed: the original and the behavior after the moving average transformation.

Command: **Arimama (behavior, phaseX, v, m)**

behavior: behavior variable

phase: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

m: number of periods over which to average

Ex: **Arimama(cry, pcry, "A", 2)**

Combine two or more data files

Description: This function combines data files. This is useful after data are created during transformations when using the **diffchart** or **ABma** functions. Once files with different phases are combined, you can use the saved file for significance testing.

Command: **Append()**

Ex: **Append()**

Tests of Statistical Significance

Proportion-frequency/binomial test

Description: Binomial test comparing the number of observations of a phase in a desired zone to another phase. User needs to select method for defining a desired zone (e.g., below one sd)

Command: **ABbinomial(phaseX, v1, v2, successA, successB)**

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

successA: number of observations in desired zone for v1

successB: number of observations in desired zone for v1

Ex: **ABbinomial(pyell,"A","B", 1, 15)**

Conservative dual-criteria test with desired zone above the lines

Description: Conservative dual-criteria test comparing the frequency of observations above both the mean and OLS regression line in any two phases.

Command: **CDCabove(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **CDCabove(esteem, pestem, "A", "B")**

Conservative dual-criteria test with desired zone below the lines

Description: Conservative dual-criteria test comparing the frequency of observations below both the mean and OLS regression line in any two phases.

Command: **CDCbelow(*behavior*, *phaseX*, *v1*, *v2*)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **CDCbelow(esteem, pesteem,"A","B")**

Conservative dual-criteria test with desired zone above the lines using robust regression

Description: Conservative dual-criteria test comparing the frequency of observations above both the mean and robust regression line in any two phases.

Command: **RobustCDCabove(*behavior*, *phaseX*, *v1*, *v2*)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **RobustCDCabove(esteem, pesteem,"A","B")**

Conservative dual-criteria test with desired zone below the lines using robust regression

Description: Conservative dual-criteria test comparing the frequency of observations below both the mean and robust regression line in any two phases.

Command: **RobustCDCbelow(*behavior*, *phaseX*, *v1*, *v2*)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **RobustCDCbelow(esteem, pesteem,"A","B")**

Chi-square test with desired zone above the mean

Description: Chi-square test comparing the frequency of observations above the mean in any two phases.

Command: **meanabove(*behavior*, *phaseX*, *v1*, *v2*)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **meanabove(esteem, pesteem,"A","B")**

Chi-square test with desired zone below the mean

Description: Chi-square test comparing the frequency of observations below the mean in any two phases.

Command: **meanbelow(*behavior*, *phaseX*, *v1*, *v2*)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **meanbelow(yell,pyell,"A","B")**

Chi-square test with desired zone above the median

Description: Chi-square test comparing the frequency of observations above the median in any two phases.

Command: **medabove(*behavior*, *phaseX*, *v1*, *v2*)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **medabove(esteem,pesteem,"A","B")**

Chi-square with desired zone below the median

Description: Chi-square test comparing the frequency of observations below the median in any two phases.

Command: **medbelow(*behavior*, *phaseX*, *v1*, *v2*)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **medbelow(yell,pyell,"A","B")**

Chi-square with desired zone above the trimmed mean

Description: Chi-square test comparing the frequency of observations above the trimmed mean in any two phases.

Command: **trimabove(*behavior*, *phaseX*, *v1*, *v2*)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **trimabove(esteem,pesteem,"A","B")**

Chi-square with desired zone below the trimmed mean

Description: Chi-square test comparing the frequency of observations below the trimmed mean in any two phases.

Command: **trimbelow(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **trimbelow(yell,pyell,"A","B")**

Chi-square with desired zone above the OLS regression line

Description: Chi-square test comparing the frequency of observations above the OLS regression line in any two phases.

Command: **regabove(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **regabove(esteem,pesteem,"A","B")**

Chi-square with desired zone below the OLS regression line

Description: Chi-square test comparing the frequency of observations below the OLS regression line in any two phases.

Command: **regbelow(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **regbelow(cry,pcry,"A","B")**

Chi-square with desired zone above the robust regression line

Description: Chi-square test comparing the frequency of observations above the robust regression line in any two phases.

Command: **robregabove(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **robregabove(esteem,pesteem,"A","B")**

Chi-square with desired zone below the robust regression line

Description: Chi-square test comparing the frequency of observations below the robust regression line in any two phases.

Command: **robregbelow(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **robregbelow(cry,pcry,"A","B")**

t-test

Description: Computes Student's *t*-test between any two phases. This test should only be used if there is not a trend in either phase AND there is no problem with autocorrelation in either phase. Graphical output is a bar chart displaying the mean for each phase.

Command: **ABttest(behavior, phaseX, v1,v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **ABttest(yell, pyell, "A","B")**

Wilcoxon Rank Sum

Description: performs a two-sample Wilcoxon test between any two phases. Nonparametric test to compare means. This test should only be used if there is not a trend in either phase AND there is no problem with autocorrelation in either phase.

Command: **ABWilcox(behavior, phaseX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

v1: phase letter entered between quotes (e.g., "A", "B")

v2: phase letter entered between quotes (e.g., "A", "B")

Ex: **ABWilcox(yell, pyell,"A","B")**

One-Way Analysis of Variance

Description: Computes one-way ANOVA and performs Tukey multiple comparison test. This test should only be used if there is not a trend in any phase AND there is no problem with autocorrelation in any phase. Use ANOVA instead of a t-test when comparing more than two phases

Command: **ABanova(behavior, phaseX)**

behavior: behavior variable

phaseX: phase variable on which test is based

Ex: **ABanova(esteem,pesteem)**

Scientific notation

Description: Converts scientific notation to five decimal places

Command: **SN(value)**

value: value to be translated

Ex: **SN((2.73e-16))**

Group Data Functions

Lag-1 autocorrelation for group data

Description: This function tests for lag-1 autocorrelation for group data. Any phase can be tested. Produces a regression line graph

Command: **GABrf2(behavior, phaseX, timeX, v1)**

behavior: behavior variable

phaseX: phase variable on which test is based

timeX: time variable (e.g., week)

v1: letter of phase being tested (e.g., "A")

Ex: **GABrf2(attend, pattend, week, "A")**

t-test for group data

Description: Computes t-test for group data. A bar graph showing the mean for each phase is displayed

Command: **GABtttest(behavior, phaseX, timeX, v1, v2)**

behavior: behavior variable

phaseX: phase variable on which test is based

timeX: time variable (e.g., week)

v1: letter of first phase (e.g., "A")

v2: letter of second phase (e.g., "B")

Ex: **GABtttest(attend, pattend, week, "A", "B")**

Draws median line group data

Description: Places median line for a single phase in group boxplot

Command: **Gmedian(behavior, phaseX, v)**

behavior: behavior variable

phaseX: phase variable on which test is based

v: letter of phase (e.g., "A")

Ex: **Gmedian(attend, pattend, "A")**