

Package ‘SSDforR’

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Type Package

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Suggests

Imports stats,graphics,grDevices,utils,MAd,metafor

Description Functions to visually and statistically analyze single system data.

License GPL (>= 2)

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R topics documented:

ABanova	3
ABarrow	4
ABautoacf	5
ABautopacf	6
ABbinomial	7
ABdescrip	8
ABiqr	9
ABlineD	10
ABlines	10
ABma	11
ABplot	12
ABplotm	13
ABregres	14

ABrf2	15
ABrobust	16
ABstat	17
ABtext	18
ABtspplot	18
ABttest	19
ABWilcox	20
Append	21
Aregres	21
Arimadiff	22
Arimama	23
Arobust	24
Cchart	25
CDCabove	26
CDCbelow	27
diffchart	28
Effectsize	28
GABrf2	29
GABttest	30
Getcsv	31
Gindex	32
Gline	33
Gmedian	33
insert	34
IQRbandgraph	35
IQRlegend	36
IQRline	37
IRD	38
listnames	39
meanabove	39
meanbelow	40
meanES	41
medabove	42
medbelow	43
metareg	44
PANDabove	45
PANDbelow	46
PANDlegend	47
Pchart	47
PEMabove	48
PEMbelow	49
PEMlegend	50
plotnum	51
PNDabove	52
PNDbelow	53
PNDlegend	54
Rchart	54
Rchartsd	56

regabove	57
regbelow	58
robregabove	59
robregbelow	60
RobustCDCabove	61
RobustCDCbelow	62
Savecsv	63
SD1	63
sd1bandgraph	64
SD1legend	65
SD2	66
sd2bandgraph	67
SD2legend	68
SDAband	68
SN	69
SPClegend	70
SPCline	71
SSDforR	72
trimabove	73
trimbelow	74
Trimline	75
Xmrchart	76
XRchart	77

Index **79**

ABanova *Analysis of variance*

Description

Computes one-way ANOVA and performs Tukey multiple comparison post-hoc test. Use ANOVA instead of a t-test when comparing more than two phases.

Usage

ABanova(behavior, phaseX)

Arguments

behavior	behavior variable
phaseX	phase variable

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Go to www.ssdanalysis.com for more information.

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p89, p147

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2,
1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B",
"B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
ABanova(cry,pcry)
```

ABarrow

Draw arrow on 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.

Usage

```
ABarrow()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Go to www.ssdanalysis.com for more information

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p46-p50

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2,
1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B",
"B", "B", NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
# now run ABplot(cry,pcry,"week","amount","Crying")
# now run ABarrow()
```

ABautoacf

Autocorrelation at any lag for a phase

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.

Usage

```
ABautoacf(behavior, phaseX, v, l)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v	letter for phase tested (e.g., "A")
l	number of lags (e.g. 1, 2, 3)

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Go to www.ssdanalysis.com for more information.

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p42 ,p141

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
ABautoacf(cry, pcry, "B", 2)
```

 ABbinomial

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).

Usage

```
ABbinomial(phaseX, v1, v2, successA, successB)
```

Arguments

phaseX	phase variable
v1	letter of first phase (e.g., "A")
v2	letter of second phase (e.g., "B")
successA	occurrences in desired zone for first phase
successB	occurrences in desired zone for second phase

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p143

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
SD1(cry,pcry,"A","week","amount","Crying")
ABbinomial(pcry,"A","B1", 1, 8)
```

 ABdescrip

Descriptive Statistics

Description

This function produces descriptive statistics for all phases. Statistics produced are: mean, 10 percent 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.

Usage

```
ABdescrip(behavior, PhaseX)
```

Arguments

behavior	behavior variable
PhaseX	phase variable

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p32, p44, p49, p98, p109, p134

Auerbach, C. & Schudrich, W. Z. (2013). *SSD for R A Comprehensive Statistical Package to Analyze Single-System Data*. *Research on Social Work Practice*, 23(3), 346-353. doi:10.1177/104973153477213

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
# ABdescrip(cry,pcry)
```

 ABiqr

Interquartile band graph through all phases

Description

Builds an iqr band graph through all phases based upon the user's selection of a phase

Usage

```
ABiqr(behavior, phaseX, v1, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	letter of phase statistics are based upon in quotation marks
ABxlab	label for x-axis in quotation marks
ABylab	label for y-axis in quotation marks
ABmain	main title in quotation marks

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p133

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
# ABiqr(cry,pcry,"week","amount","Crying")
```

ABlineD

Add dashed line to a graph

Description

Enables the user to draw dashed vertical lines between phases on a graph.

Usage

```
ABlineD(behavior)
```

Arguments

behavior behavior variable

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p96

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
# now run ABplot(cry,pcry,"week","amount","Crying")
# now run ABlineD(cry)
```

ABlines*Draw line*

Description

This function enables the user to draw solid vertical lines between phases on a graph.

Usage

```
ABlines(behavior)
```

Arguments

behavior behavior variable

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University; Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p46, p50, p51, p60, p61, p71, p75, p76, p79, p105, p108, p129

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
# now run ABplot(cry,pcry,"week","amount","Crying")
# now run ABlines(cry)
```

ABma

Moving average

Description

Creates moving average transformation using every two observations. A graph is produced and the user is given the option to save the transformed data.

Usage

```
ABma(behavior, phaseX, v1)
```

Arguments

behavior behavior variable

phaseX phase variable

v1 letter of phase to be transformed (e.g., "A")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p38-39, p67, p142

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
ABma(cry, pcry, "A")
```

ABplot

Simple line graph

Description

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

Usage

```
ABplot(behavior, phaseX, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
phaseX	phase variable
ABxlab	label for x-axis between quotation marks
ABylab	label for y-axis between quotation marks
ABmain	main title for graph between quotation marks

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p46, p48,p50, p108,p128

Auerbach, C. & Schudrich, W. Z. (2013). *SSD for R A Comprehensive Statistical Package to Analyze Single-System Data*. *Research on Social Work Practice*, 23(3), 346-353. doi:10.1177/104973153477213

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
# ABplot(cry,pcry,"week","amount","Crying")
```

ABplotm

Multiple line plot

Description

This function should be used to create multiple line charts. This function must be used after the environment is set up using the plotnum() function.

Usage

```
ABplotm(behavior, phaseX, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
phaseX	phase variable
ABxlab	label for x-axis between quotation marks
ABylab	label for y-axis between quotation marks
ABmain	main title for graph between quotation marks

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University; Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p108, p129

Go to www.analysis.com for more information.

Examples

```

cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
yell<-c(3, 4, 2, 5, 5, 4, NA, 1, 2, 2, 2, 0, 0)
pyell<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B")
plotnum(2, 1)
ABplotm(cry,pcry,"week","amount","Crying")
ABplotm(yell,pyell,"week","amount","Yelling")

```

ABregres

*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.

Usage

```
ABregres(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase letter (e.g., "A")
v2	second phase letter (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p52, p53, p54, p135

Auerbach, C. & Schudrich, W. Z. (2013). SSD for R A Comprehensive Statistical Package to Analyze Single-System Data. Research on Social Work Practice, 23(3), 346-353. doi:10.1177/104973153477213

Go to www.ssdanalysis.com for more information.

Examples

```

cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
ABregres(cry,pcry,"A","B")

```

 ABrf2

Lag-1 autocorrelation (rf2 for small sample size)

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.

Usage

```
ABrf2(behavior, phaseX, v1)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	letter of phase being tested (e.g., "A")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Huitema, B.F. & McKean, J.W. (1994). Two reduced-biased autocorrelation estimators: rF1 and rF2. *Perceptual and Motor Skills*, 78(1), 323-330.

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p18, p37-41, p65, p66, p141

Auerbach, C. & Schudrich, W. Z. (2013). *SSD for R A Comprehensive Statistical Package to Analyze Single-System Data*. *Research on Social Work Practice*, 23(3), 346-353. doi:10.1177/104973153477213

Go to www.ssdanalysis.com for more information

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
ABrf2(cry, pcry, "B1")
```

ABrobust

Robust regression

Description

Uses MASS package developed by Brian Ripley <ripley@stats.ox.ac.uk> to conduct robust 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.

Usage

```
ABrobust(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	letter of first phase in quotation marks (e.g., "A")
v2	letter of second phase in quotation marks (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p135

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
ABrobust(cry,pcry,"A","B")
```

ABstat *Add statistic line(s)*

Description

Add a mean and/or median line to an ABplot.

Usage

```
ABstat(behavior, phaseX, v, statX)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v	phase letter in quotation marks (e.g., "A")
statX	statistic in quotation marks (i.e. "mean", "median")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p48, p50, p51, p138

Auerbach, C. & Schudrich, W. Z. (2013). SSD for R A Comprehensive Statistical Package to Analyze Single-System Data. Research on Social Work Practice, 23(3), 346-353. doi:10.1177/104973153477213

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
# now run this ABplot(cry,pcry,"week","amount","Crying")
# run this statement ABstat(cry, pcry, "A", "median")
```

 ABtext

Add text to graph

Description

Add text to graphs. Text must appear between quotation marks.

Usage

```
ABtext(textx)
```

Arguments

textx text string must be entered between quotation marks (e.g., "baseline")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p30, p46, p47, p48, p50, p51, p60, p61, p71, p73, p75

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
# run this ABplot(cry,pcry,"week","amount","Crying")
# now run ABtext("A")
```

 ABtsplo

Time series plot for SSD Data

Description

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

Usage

```
ABtsplo(behavior, phaseX, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
phaseX	phase variable
ABxlab	label for x-axis between quotation marks (e.g., "week")
ABylab	label for y-axis between quotation marks (e.g., "amount")
ABmain	main title graph between quotation mark (e.g., "Crying")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
ABtspplot(cry,pcry,"week","amount","Crying")
```

ABttest	<i>T-test comparing phases</i>
---------	--------------------------------

Description

Computes t-test comparing any two phases selected by user. Bar graph displaying means for each phase is displayed in the graph window.

Usage

```
ABttest(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	letter of first phase (e.g., "A")
v2	letter of second phase (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p87, p91, p146-147

Auerbach, C. & Schudrich, W. Z. (2013). SSD for R A Comprehensive Statistical Package to Analyze Single-System Data. *Research on Social Work Practice*, 23(3), 346-353. doi:10.1177/104973153477213

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
# now run ABttest(cry,pcry,"A","B")
```

ABWilcox

Wilcoxon rank-sum test between two phases

Description

Performs a two-sample Wilcoxon rank-sum nonparametric test between any two phases.

Usage

```
ABWilcox(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase letter (e.g., "A")
v2	second phase letter (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p147

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
ABWilcox(cry,pcry,"A","B")
```

Append

Append data sets with additional data

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.

Usage

```
Append()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p67, p91, p143

Go to www.ssdanalysis.com for more information.

Examples

```
# type Append()
```

Aregres

Regression for 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.

Usage

```
Aregres(behavior, phaseX, v1)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	phase letter (e.g., "A")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p34, p35-36, p134

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
Aregres(cry,pcry,"A")
```

Arimadiff

Difference for ARIMA

Description

Differencing in any phase. Graphs display both original data and differenced data.

Usage

```
Arimadiff(behavior, phaseX, v, d)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v	phase letter in quotation marks (e.g., "A")
d	integer for order of difference

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p142

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
Arimadiff(cry,pcry,"B1",2)
```

Arimama

Moving average for ARIMA

Description

Moving average over any period for ARIMA. Uses TTR Package.

Usage

```
Arimama(behavior, phaseX, v, m)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v	phase letter in quotation markse (e.g., "A")
m	number of periods to average over (e.g., 2)

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p142-143

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
Arimama(cry,pcry,"B1",2)
```

Arobust

Robust regression for a single phase

Description

Uses MASS package developed by Brian Ripley <ripley@stats.ox.ac.uk> to conduct robust regression for a single phase. Coefficients and residuals are produced. Also a graph with a regression line is displayed for the phase in the graph window.

Usage

```
Arobust(behavior, phaseX, v1)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	phase letter (e.g., "A")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p143

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
Arobust(cry,pcry,"A")
```


Cchart

*SPC 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.

Usage

```
Cchart(behavior, phaseX, v1, bandX, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	phase letter analysis is based upon in quotation marks (e.g., "A")
bandX	number of standard deviations desired (e.g., 2)
ABxlab	label for x-axis between quotation marks (e.g., "weeks")
ABylab	label for y-axis between quotation marks (e.g., "amount")
ABmain	main title between quotation marks (e.g., Crying)

Author(s)

Charles Auerbach, PhD and Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p77, p140

Bloom, M., Fischer, J. & Orme, J.G. (2009). *Evaluating practice: Guidelines for the accountable professional* (6th ed.). New York: Pearson.

Orme, J. & Cox, M.E. (2001). Analyzing single-subject design data using statistical proces control charts. *Social Work Research*, 25(2), 115-127.

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
Cchart(cry,pcry,"A",2,"week","amount","Crying")
```

 CDCabove

Conservative Dual Criteria (CDC) desired zone above lines

Description

The conservative dual-criteria (CDC) is a relatively new approach to comparing phases that works well when data have a moderate lag-1 autocorrelation (lower than 0.6). This function uses two lines to define the desired zone: the mean and the regression line of the comparison phase.

Usage

```
CDCabove(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	phase letter of first (i.e., comparison) phase between quotation marks (e.g., "A")
v2	phase letter of second phase between quotation marks (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p85, p143

Fisher, W.W., Kelley, M.E. & Lomas, J.E. (2003). Visual aids and structured criteria for improving visual inspection and interpretation of single-case designs. *Journal of Applied Behavior Analysis*, 36(3), 387-406.

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
CDCabove(cry,pcry,"A","B")
```

 CDCbelow

Conservative Dual Criteria (CDC) desired zone below lines

Description

The conservative dual-criteria (CDC) is a relatively new approach to comparing phases that works well when data have a moderate lag-1 autocorrelation (lower than 0.6). This function uses two lines to define the desired zone: the mean and the regression line of the comparison phase.

Usage

```
CDCbelow(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	phase letter of first (i.e., comparison) phase between quotation marks (e.g., "A")
v2	phase letter of second phase between quotation marks (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p85, p143

Fisher, W.W., Kelley, M.E. & Lomas, J.E. (2003). Visual aids and structured criteria for improving visual inspection and interpretation of single-case designs. *Journal of Applied Behavior Analysis*, 36(3), 387-406.

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
CDCbelow(cry,pcry,"A","B")
```

diffchart *Difference transformation*

Description

Produces first difference transformation on any phase.

Usage

```
diffchart(behavior, phaseX, v1)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	letter for phase to be transformed between quotation marks (e.g., "A")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p39, p40, p65-66, p90, p142

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
diffchart(cry,pcry,"A")
```

Effectsize *Effect size*

Description

The effect size function automatically 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.

Usage

```
Effectsize(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase letter between quotation marks (e.g., "A")
v2	second phase letter between quotation marks (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p56-57, p103, p135

Cohen, J.(1988).Statistical Power analysis for the behavioral sciences (2nd ed). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Glass, G. V., McGaw, B., & Smith, M. L. (1981) Meta-analysis in social research. Thousand Oaks, CA: SAGE Publications, Inc.

Bloom, M., Fischer, J. & Orme, J.G. (2009). Evaluating practice: Guidelines for the accountable professional (6th ed.). New York: Pearson.

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
Effectsize(cry,pcry,"A","B")
```

GABrf2

Autocorrelation for group data

Description

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

Usage

```
GABrf2(behavior, phaseX, timeX, v1)
```

Arguments

behavior	behavior variable
phaseX	phase variable
timeX	time variable (e.g., week)
v1	letter of phase being tested in quotation marks (e.g., "A")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p99, p101, p147

Huitema, B.F. & McKean, J.W. (1994). Two reduced-biased autocorrelation estimators: rF1 and rF2. *Perceptual and Motor Skills*, 78(1), 323-330.

Go to www.ssdanalysis.com for more information.

Examples

```
attend<-c(0,0,0,1,0,0,1,0,0,1,0,0,1,0,1,0,0,0,0,0,1,1,0,0,1,NA,
0,1,1,0,1,1,0,1,1,1,0,1,0,0,1,1,1,1,0,0,1,1,0,1,0,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1)

week<-c(1,1,1,1,1,2,2,2,2,2,3,3,3,3,3,4,4,4,4,4,5,5,5,5,5,NA,6,6,6,6,6,7,7,7,7,7,
8,8,8,8,8,9,9,9,9,9,10,10,10,10,10,11,11,11,11,11,12,12,12,12,12,13,
13,13,13,13,14,14,14,14,14,15,15,15,15,15)

pattend<-c("A","A","A","A","A","A","A","A","A","A","A","A","A","A","A","A","A",
"A","A","A","A","A",
"A","A","A",NA,"B","B","B","B","B","B","B","B","B","B","B","B","B",
"B","B","B",
"B","B","B","B","B","B","B","B","B","B","B","B","B","B","B",
"B","B","B","B","B","B","B","B","B","B","B","B","B","B","B","B")
# now run: GABrf2(attend,pattend,week,"A")
```

GABttest

T-test for group data

Description

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

Usage

```
GABttest(behavior, phaseX, timeX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
timeX	time variable (e.g., week)
v1	first phase letter between quotation marks (e.g., "A")
v2	second phase letter between quotation marks (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p104, p108

Go to www.ssdanalysis.com for more information.

Examples

```
attend<-c(0,0,0,1,0,0,1,0,0,1,0,0,1,0,1,0,0,0,0,0,1,1,0,0,1,NA,
0,1,1,0,1,1,0,1,1,1,0,1,0,0,1,1,1,1,0,0,1,1,0,1,0,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1)

week<-c(1,1,1,1,1,2,2,2,2,2,3,3,3,3,3,4,4,4,4,4,4,5,5,5,5,5,NA,6,6,
6,6,6,7,7,7,7,7,
8,8,8,8,8,9,9,9,9,9,10,10,10,10,10,11,11,11,11,11,12,
12,12,12,12,13,
13,13,13,13,14,14,14,14,14,15,15,15,15,15)

pattend<-c("A","A","A","A","A","A","A","A","A","A","A","A","A","A","A",
"A","A","A","A","A","A","A","A","A",
"A","A","A",NA,"B","B","B","B","B","B","B","B","B","B","B",
"B","B","B","B","B","B","B",
"B","B","B","B","B","B","B","B","B","B","B","B","B","B","B",
"B","B","B","B","B","B","B","B","B","B","B","B","B",
,B","B","B","B")
# now run GABttest(attend, pattend, week, "A", "B")
```

Getcsv

Import .csv file

Description

Imports .csv file created in any software package. Uses dialog box to acquire file. IMPORTANT NOTE: After the file is open type 'attach(ssd)' in the Console and press <RETURN> to manipulate file. Also, can type 'listnames()' to review variable names. Before you open another file type 'detach(ssd)' in the console and press <RETURN>.

Usage

```
Getcsv()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p22, p29, p44, p66, p90, p91, pp95, p128

Go to www.ssdanalysis.com for more information.

Examples

```
# type Getcsv()
```

Gindex

G-index

Description

The g-index is a measure of effect size calculated using the proportion of scores in the desired zone. Used when there is a trend in the data.

Usage

```
Gindex(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase letter between quotation marks (e.g., "A")
v2	second phase letter between quotation marks (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p57-59

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
Gindex(cry,pcry,"A","B")
```

Gline

Draw Goal line

Description

Draws a goal line

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Go to www.ssdanalysis.com for more information.

Examples

```
# type Gline()
```

Gmedian

Median line for group data

Description

Places median line for baseline in group boxplot.

Usage

```
Gmedian(behavior, phaseX, v)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v	phase letter for baseline (e.g., "A")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p96, p148

Go to www.ssdanalysis.com for more information.

Examples

```
cohesion<-c(85,90,80,84,82,79,75,76,80,84,75,80,79,83,88,78,80,85,83,
82,89,84,89,91,87,84,77,86,80,
89,81,86,88,83,86,90,86,85,85,87,80,89,NA,86,87,88,89,79,73,75,
74,70,75,81,85,75,73,75,
79,70,72,71,69,70,64,60,59,54,53,55,50,54,51,49,
48,50,46,55,51,55,49,50,48,51,33)
```

```
week<-c(1,1,1,1,1,1,1,2,2,2,2,2,2,3,3,3,3,3,3,3,4,4,4,4,4,4,5,
5,5,5,5,5,6,6,6,6,6,6,NA,7,7,7,7,7,7,8,8,8,8,8,8,9,
9,9,9,9,9,10,10,10,10,10,10,10,11,11,11,11,11,11,11,12,
12,12,12,12,12,12)
```

```
pcohesion<-c("A","A","A","A","A","A","A","A","A","A","A","A",
"A","A","A","A","A",
"A","A","A","A","A","A","A","A","A","A","A","A","A","A","A",
"A","A","A","A","A","A","A","A","A","A","A","A","A","A","A",
"B","B","B","B","B",
"B","B","B","B","B","B","B","B","B","B","B","B",
"B","B","B","B","B",
"B","B","B","B","B","B","B","B","B","B","B","B",
"B","B","B","B","B","B","B","B","B","B",
"B","B","B","B","B","B")
ABdescrip(cohesion,week)
Gmedian(cohesion,pcohesion,"A")
```

insert

insert

Description

Insert function - this function is not in use by SSD for R end-users.

Usage

```
insert(v, e, pos)
```

Arguments

v	not used
e	not used
pos	not used

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Go to www.ssdanalysis.com for more information.

Examples

```
# This function is not in use by SSD for R end-users.
```

IQRbandgraph

Interquartile band graph for one phase

Description

Draws an interquartile band graph for any phase.

Usage

```
IQRbandgraph(behavior, phaseX, v1, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	letter for phase for which bands will be drawn (e.g., "A")
ABxlab	label for x-axis in quotation marks (e.g., "weeks")
ABylab	lable for y-axis in quotation marks (e.g., "amount")
ABmain	main title for graph in quotation marks (e.g., "Crying")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p133

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
IQRbandgraph(cry,pcry,"A","week","amount","Crying")
```

IQRlegend

IQR legend

Description

This function creates a legend on an IQR band graph. NOTE: Once this legend is in place, the graph can no longer be altered.

Usage

```
IQRlegend()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva Univeresity, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p133

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
IQRbandgraph(cry,pcry,"A","week","amount","Crying")
IQRlegend()
```

IQRline	<i>IQR line for ABplot</i>
---------	----------------------------

Description

This function enables a user to add lines representing the interquartile range to any phase of an ABplot.

Usage

```
IQRline(behavior, phaseX, v)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v	phase letter upon which IQR stats are based - in quotation marks (e.g., "A")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p50, p131

Go www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
ABplot(cry,pcry,"week","amount","Crying")
# type IQRline(cry, pcry, "A")
```

Description

This effect size function will compute the IRD and display a graph in the graph window. The user will be prompted to enter a value for a reference line, identify the number of intervention points remaining and the number of baseline data points that would be needed to be removed in order to eliminate all overlap or ties between phases.

Usage

```
IRD(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase letter (e.g., "A")
v2	second phase letter (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p62-65, p136

Bloom, M., Fischer, J. & Orme, J.G. (2009). Evaluating practice: Guidelines for the accountable professional (6th ed.). New York: Pearson.

Parker, R.I. & Hagan-Burke, S. (2007). Median-based overlap analysis for single case data: A second study. Behavior Modification, 31(6), 919-936.

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
IQRbandgraph(cry,pcry,"A","week","amount","Crying")
IRD(cry,pcry,"A","B")
```

listnames	<i>List variable names</i>
-----------	----------------------------

Description

Lists variable names in active data.

Usage

```
listnames()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p22, p71, p74, p95, p128

Go to www.ssdanalysis.com for more information.

Examples

```
# type: listnames()
```

meanabove	<i>Chi-square - desired values above the mean</i>
-----------	---

Description

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

Usage

```
meanabove(behavior, phaseX, v1, v2)
```

Arguments

	behavior variable
phaseX	phase variable
v1	first phase letter (e.g., "A")
v2	second phase letter (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p84, p144

Go to www.ssdanalysis.com for more information.

Examples

```
esteem<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA,
2, 2, 1, 2, 1, 0, 0, 0)
pesteem<-c("A", "A", "A", "A", "A", "A", NA,
"B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1")
meanabove(esteem, pesteem, "A", "B1")
```

meanbelow

Chi-square - desired values below the mean

Description

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

Usage

```
meanbelow(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase letter (e.g., "A")
v2	second phase letter (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2,
NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A",
NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
meanbelow(cry,pcry,"A","B1")
```

meanES	<i>Mean Effect Size</i>
--------	-------------------------

Description

This function builds a simple line graph for a given behavior across all phases. A space separates each phase. A file containing saved effect sizes must be opened by Getcvts() and then attached.

Usage

```
meanES(es, lab, esmain)
```

Arguments

es	effect size variable
lab	Label variable
esmain	main title for graph between quotation marks

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p46, p48,p50, p108,p128

Auerbach, C. & Schudrich, W. Z. (2013). SSD for R A Comprehensive Statistical Package to Analyze Single-System Data. Research on Social Work Practice, 23(3), 346-353. doi:10.1177/104973153477213

Go to www.ssdanalysis.com for more information.

Examples

```
#need to open a file
```

 medabove

Chi-square - desired values above the median

Description

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

Usage

```
medabove(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase letter (e.g., "A")
v2	second phase letter (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin Schudrich, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Go to www.ssdanalysis.com for more information.

Examples

```
esteem<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2,
1, 0, 0, 0)
pesteem<-c("A", "A", "A", "A", "A", "A",
NA, "B", "B", "B", "B", "B",
"B", NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
medabove(esteem, pesteem, "A", "B1")
```

 medbelow

Chi-square - desired values below the median

Description

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

Usage

```
medbelow(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase letter (e.g., "A")
v2	second phase letter (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin Schudrich, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p84, p144

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
medbelow(cry,pcry,"A","B1")
```

`metareg`*Meta Regression*

Description

Meta regression for saved effect sizes in SSDforR. Use the `Getcsv()` function to open the saved effect size file.

Usage

```
metareg(es, v)
```

Arguments

<code>es</code>	effect size variable
<code>v</code>	variance of effect size

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Go to www.ssdanalysis.com for more information.

Del Re, A. C. (2015). A practical tutorial on conducting meta-analysis in R. *The Quantitative Methods for Psychology*, 11(1), 37-50.

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014.

Examples

```
ES<-c(.3, .4, .2, .5, .3, .4)
V<-c(.01, .03, .04, .02, .03, .02)

metareg(ES,V)
```

 PANDbelow

PAND - desired values below the reference line

Description

This effect size 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.

Usage

```
PANDbelow(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase variable (e.g., "A")
v2	second phase variable (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p62, p136

Lenz, A.S. (2012). Calculating effect size in single-case research: A comparison of nonoverlap methods. *Measurement and Evaluation in Counseling and Development*, 46(1), 64-73.

Parker, R.I. & Hagan-Burker, S. & Vannest, K. (2007). Percentage of all non-overlapping data: An alternative to PND. *The Journal of Special Education*, 40(4), 194-204.

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
PANDbelow(cry,pcry,"A","B1")
```

PANDlegend

PAND legend

Description

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

Usage

```
PANDlegend()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p136

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
PANDbelow(cry,pcry,"A","B1")
PNDlegend()
```

Pchart

SPC P-chart

Description

This function builds a P-chart and can be used when the target behavior has a binary outcome. This chart allows for a comparison of the proportion of tasks completed over time or between phases. A space separates each phase.

Usage

```
Pchart(behavior, groupX, bandX, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
groupX	grouping variable
bandX	number of standard deviations desired (e.g., 2)
ABxlab	label for x-axis between quotation marks (e.g., "weeks")
ABylab	label for y-axis between quotation marks (e.g., "attendance")
ABmain	main title for chart between quotation marks (e.g., "Attendance Over Time")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p75, p139-140

Orme, J. & Cox, M.E. (2001). Analyzing single-subject design data using statistical process control charts. Social Work Research, 25(2), 115-127.

Go to www.ssdanalysis.com for more information.

Examples

```
attend<-c(0,0,0,1,0,0,1,0,0,1,0,0,1,0,1,0,0,0,0,0,1,1,0,0,1,NA,
0,1,1,0,1,1,0,1,1,1,0,1,0,0,1,1,1,1,0,0,1,1,0,1,0,1,1,1,1,1,1,
1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1)

day<-c(1,1,1,1,1,2,2,2,2,2,3,3,3,3,3,4,4,4,4,4,5,5,5,5,5,NA,6,6,
6,6,6,7,7,7,7,7,
8,8,8,8,8,9,9,9,9,9,10,10,10,10,10,11,11,11,11,
11,12,12,12,12,12,13,
13,13,13,13,14,14,14,14,14,15,15,15,15,15)
Pchart(attend, day, 2, "week", "amount", "Group attendance")
```

PEMabove

PEM - desired values above the reference line

Description

Percentage of Data Exceeding the Median (PEM). The 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.

Usage

```
PEMabove(behavior, phaseX, v1, v2)
```


Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase variable (e.g., "A")
v2	second phase variable (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p60, p137

Lenz, A.S. (2012). Calculating effect size in single-case research: A comparison of nonoverlap methods. *Measurement and Evaluation in Counseling and Development*, 46(1), 64-73.

Ma, H-H. (2009). The effectiveness of intervention on the behavior of individuals with autism: A meta-analysis using percentage of data points exceeding the median of baseline phase. *Behavior Modification*, 33(3), 339-359.

Go to www.ssdanalysis.com for more information.

Examples

```
esteem<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pesteem<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
PEMabove(esteem,pesteem,"A","B1")
```

PEMbelow

PEM - desired values below the reference line

Description

Percentage of Data Exceeding the Median (PEM). The 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.

Usage

```
PEMbelow(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase variable (e.g., "A")
v2	second phase variable (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Lenz, A.S. (2012). Calculating effect size in single-case research: A comparison of nonoverlap methods. *Measurement and Evaluation in Counseling and Development*, 46(1), 64-73.

Ma, H-H. (2009). The effectiveness of intervention on the behavior of individuals with autism: A meta-analysis using percentage of data points exceeding the median of baseline phase. *Behavior Modification*, 33(3), 339-359.

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
PEMbelow(cry,pcry,"A","B")
```

PEMlegend

PEM legend

Description

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

Usage

```
PEMlegend()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Go to www.ssdanalysis.com for more information.

Examples

```

cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
#run first
PEMbelow(cry,pcry,"A","B1")
#run after complete steps above
PEMlegend()

```

plotnum	<i>Set graphic environment</i>
---------	--------------------------------

Description

Used prior to ABplotm to set up graphic environment.

Usage

```
plotnum(nr, nc)
```

Arguments

nr	number of rows of graphs desired (e.g., 2)
nc	number of columns of graphs desired (e.g., 3)

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p107

Go to www.ssdanalysis.com for more information.

Examples

```

cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
yell<-c(3, 4, 2, 5, 5, 4, NA, 1, 2, 2, 2, 0, 0)
pyell<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B")
plotnum(2, 1)
ABplotm(cry,pcry,"week","amount","Crying")
ABplotm(yell,pyell,"week","amount","Yelling")

```

 PNDabove

PND - desired values above the reference line

Description

This effect size function evaluates the percentage of non-overlapping data (PND) above highest data point in the comparison phase.

Usage

```
PNDabove(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	comparison phase variable (e.g., "A")
v2	letter of second phase (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Lenz, A.S. (2012). Calculating effect size in single-case research: A comparison of nonoverlap methods. *Measurement and Evaluation in Counseling and Development*, 46(1), 64-73.

Scruggs, T.E. & Mastropieri, M.A. (2012). PND at 25: Past, present, and future trends in summarizing single-subject research. *Remedial and Special Education*, 34(1), 9-19.

Go to www.ssdanalysis.com for more information.

Examples

```
esteem<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pesteem<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
PNDabove(esteem, pesteem, "A", "B1")
```

PNDbelow

*PND - desired values below the reference line***Description**

This effect size function evaluates the percentage of non-overlapping data (PND) below the lowest data point in the comparison phase.

Usage

```
PNDbelow(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	comparison phase variable (e.g., "A")
v2	second phase variable (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Lenz, A.S. (2012). Calculating effect size in single-case research: A comparison of nonoverlap methods. *Measurement and Evaluation in Counseling and Development*, 46(1), 64-73.

Scruggs, T.E. & Mastropieri, M.A. (2012). PND at 25: Past, present, and future trends in summarizing single-subject research. *Remedial and Special Education*, 34(1), 9-19.

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p60, p137

Lenz, A.S. (2012). Calculating effect size in single-case research: A comparison of nonoverlap methods. *Measurement and Evaluation in Counseling and Development*, 46(1), 64-73.

Parker, R.I. & Hagan-Burker, S. & Vannest, K. (2007). Percentage of all non-overlapping data: An alternative to PND. *The Journal of Special Education*, 40(4), 194-204.

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
PNDbelow(cry,pcry,"A","B1")
```

 PNDlegend

PND legend

Description

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

Usage

```
PNDlegend()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p62, p136

Parker, R.I. & Hagan-Burker, S. & Vannest, K. (2007). Percentage of all non-overlapping data: An alternative to PND. The Journal of Special Education, 40(4), 194-204.

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
#run first
PNDbelow(cry,pcry,"A","B1") #run after complete steps above
PNDlegend()
```

 Rchart

SPC R-chart using mean range

Description

The R-Chart is designed to detect changes in variation over time. This is one of two forms of the R-chart and should be used with small samples. This function uses the mean range of samples to track variation.

Usage

```
Rchart(behavior, groupX, bandX, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
groupX	grouping variables (e.g., day)
bandX	number of standard deviations desired (e.g., 2)
ABxlab	x-axis label in quotation marks (e.g., "weeks")
ABylab	y-axis label in quotation marks (e.g., "amount")
ABmain	main title for graph in quotation marks (e.g., "Problem Range")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p73-74, p136, p106-107, p138-139

Orme, J. & Cox, M.E. (2001). Analyzing single-subject design data using statistical process control charts. *Social Work Research*, 25(2), 115-127.

Go to www.ssdanalysis.com for more information.

Examples

```
admit<-c(85,90,80,84,82,79,75,76,80,84,75,80,79,83,88,78,80,85,83,
82,89,84,89,91,87,84,77,86,80,
89,81,86,88,83,86,90,86,85,85,87,80,89,
NA,86,87,88,89,79,73,75,74,70,75,81,85,75,73,75,
79,70,72,71,69,70,64,60,59,54,53,55,50,54,51,
49,48,50,46,55,51,55,49,50,48,51,33)

day<-c(1,1,1,1,1,1,1,2,2,2,2,2,2,3,3,3,3,3,3,4,4,4,4,4,4,5,
5,5,5,5,5,6,6,6,6,6,6,NA,7,7,7,7,7,7,8,8,8,8,8,8,9,
9,9,9,9,9,10,10,10,10,10,10,10,11,11,11,11,11,11,
11,12,12,12,12,12,12,12)

padmit<-c("A","A","A","A","A","A","A","A","A","A",
"A","A","A","A","A","A","A","A",
"A","A","A","A","A","A","A","A","A","A","A","A","A","A",
"A","A","A","A","A","A","A","A","A","A",
NA,"B","B","B","B","B","B","B","B",
"B","B","B","B","B","B","B","B","B","B",
"B","B","B","B","B","B",
"B","B","B","B","B","B","B","B","B",
"B","B","B","B","B","B","B","B",
"B","B","B","B","B","B","B")
Rchart(admit, day, 2, "week", "amount", "Admits to Hospital")
```

Rchartsd

*SPC R-chart using standard deviation***Description**

The R-Chart is designed to detect changes in variation over time. This is one of two forms of the R-chart and should be used with samples larger than ten. This function uses the standard deviation of samples to track variation.

Usage

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

Arguments

behavior	behavior variable
groupX	grouping variable (e.g., day)
bandX	number of standard deviations desired (e.g., 2)
ABxlab	label for x-axis in quotation marks, (e.g., "day")
ABylab	label for y-axis in quotation marks (e.g., "amount")
ABmain	main title for graph in quotation marks (e.g., "Variation in Admits")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Orme, J. & Cox, M.E. (2001). Analyzing single-subject design data using statistical process control charts. *Social Work Research*, 25(2), 115-127.

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p76, p109, p139

Go to www.ssdanalysis.com for more information.

Examples

```
admit<-c(85,90,80,84,82,79,75,76,80,84,75,80,79,83,88,78,80,85,83,82,89,84,89,91,87,84,77,86,80,
89,81,86,88,83,86,90,86,85,85,87,80,89,NA,86,87,88,89,79,73,75,74,70,75,81,85,75,73,75,
79,70,72,71,69,70,64,60,59,54,53,55,50,54,51,49,48,50,46,55,51,55,49,50,48,51,33)
```

```
day<-c(1,1,1,1,1,1,1,2,2,2,2,2,2,3,3,3,3,3,3,4,4,4,4,4,4,5,
5,5,5,5,5,6,6,6,6,6,6,NA,7,7,7,7,7,7,8,8,8,8,8,8,9,
9,9,9,9,9,10,10,10,10,10,10,10,11,11,11,11,11,11,11,
12,12,12,12,12,12,12)
```

 regbelow

Chi-square - desired values below regression line

Description

Chi-square test comparing the frequency of observations below the regression line in a comparison phase to another phase.

Usage

```
regbelow(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	letter of comparison phase in quotation marks (e.g., "A")
v2	letter of second phase in quotation marks (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p83, p146

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
regbelow(cry,pcry,"A","B1")
```

 robregbelow

Chi-square - desired values below robust regression line

Description

Chi-square test comparing the frequency of observations below the robust regression line in a comparison phase to another phase.

Usage

```
robregbelow(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	letter of comparison phase in quotation marks (e.g., "A")
v2	letter of second phase in quotation marks (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p85, p146

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
robregbelow(cry,pcry,"A","B1")
```

Savecsv	<i>Save data file</i>
---------	-----------------------

Description

Save .csv file edited in SSDforR. Uses dialogue box to save file.

Usage

```
Savecsv()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p125, p126, p128

Go to www.ssdanalysis.com for more information.

Examples

```
# type Savecsv()
```

SD1	<i>1-standard deviation band graph</i>
-----	--

Description

Produces graph for all phases with mean and one standard deviation bands displayed for a comparison phase across all phases. Output in the Console displays the sd, the mean, and values for the sd bands.

Usage

```
SD1(behavior, phaseX, v1, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	letter for phase variable stats are base upon in quotation marks (e.g., "A")
ABxlab	x-axis label in quotation marks (e.g., "week")
ABylab	y-axis label in quotation marks (e.g., "amount")
ABmain	main title label in quotation marks (e.g., "Crying")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p51, p79, p132 Go to [www.ssdanalysis](http://www.ssdanalysis.com) for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
SD1(cry,pcry,"A","week","amount","Crying")
```

sd1bandgraph

1-standard deviation band graph for one phase

Description

Produces graph for one phase with mean and one standard deviation bands displayed. Output in the Console displays the sd, the mean, and values for the sd bands.

Usage

```
sd1bandgraph(behavior, phaseX, v1, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	phase letter (e.g., "A")
ABxlab	x-axis label in quotation marks (e.g., "week")
ABylab	y-axis label in quotation marks (e.g., "amount")
ABmain	main title in quotation marks (e.g., "Crying")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva Univeresity, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p131

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
sd1bandgraph(cry,pcry,"A","week","amount","Crying")
```

SD1legend

SD1 legend

Description

Adds legend to SD1 band graph. The graph can not be modified in any way after the legend is added.

Usage

```
SD1legend()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p132

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA,
2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A",
NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
SD1(cry,pcry,"A","week","amount","Crying")
SD1legend()
```

SD2

*2-standard deviation band graph***Description**

Produces graph for all phases with mean and two standard deviation bands displayed for a comparison phase across all phases. Output in the Console displays the sd, the mean, and values for the sd bands.

Usage

```
SD2(behavior, phaseX, v1, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	letter for phase variable stats are base upon in quotation marks (e.g., "A")
ABxlab	x-axis label in quotation marks (e.g., "week")
ABylab	y-axis label in quotation marks (e.g., "amount")
ABmain	main title in quotation marks (e.g., "Crying")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p32-133

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2,
1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA,
"B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
SD2(cry,pcry,"A","week","amount","Crying")
```

sd2bandgraph

2-standard deviation band graph for one phase

Description

Produces graph for one phase with mean and two standard deviation bands displayed. Output in the Console displays the sd, the mean, and values for the sd bands.

Usage

```
sd2bandgraph(behavior, phaseX, v1, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	phase letter (e.g., "A")
ABxlab	x-axis label in quotation marks (e.g., "week")
ABylab	y-axis label in quotation marks (e.g., "amount")
ABmain	main title in quotation marks (e.g., "Crying")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p34, p132

Go www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA,
2, 2, 3, 2, 1, 2, NA,
2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA,
"B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
sd2bandgraph(cry,pcry,"A","week","amount","Crying")
```

SD2legend

SD2 legend

Description

Adds legend to SD2 band graph. The graph can not be modified in any way after the legend is added.

Usage

```
SD2legend()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. p133

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
SD2(cry,pcry,"A","week","amount","Crying")
SD2legend()
```

SDAband

Adds standard deviation bands to an ABplot

Description

Adds standard deviation bands to an ABplot. Click in the phase twice to add upper and lower bands.

Usage

```
SDAband(behavior, phaseX, v, bandX)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v	phase band is based upon (e.g., "A")
bandX	number of standard deviations desired (e.g., 2)

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p131

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
ABplot(cry,pcry,"week","amount","Crying")
# now run SDAband(cry,pcry,"A",2)
```

 SN

Scientific notation

Description

Converts scientific notation to decimals.

Usage

```
SN(value)
```

Arguments

value	value to be converted from scientific notation
-------	--

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work


```

"A","A","A","A","A","A",
"A","A","A","A","A","A","A","A","A","A","A","A","A","A","A",
"A","A","A","A","A","A","A","A","A","A","A","A","A","A","A",
"B","B","B","B","B","B",
"B","B","B","B","B","B","B","B","B","B","B","B","B",
"B","B","B","B",
"B","B","B","B","B","B","B","B","B","B","B",
"B","B","B","B","B","B")
Rchart(admit, day, 2, "week", "amount", "Admits to Hospital")
# now run SPCLine()

```

SSDforR

List of all functions in SSD for R

Description

Lists all the functions available in the SSD for R package.

Usage

```
SSDforR()
```

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler school of social work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p18

Go to www.ssdanalysis.com for more information.

Examples

```
SSDforR()
```

 trimbelow

Chi-square - desired values below the trimmed mean

Description

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

Usage

```
trimbelow(behavior, phaseX, v1, v2)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	first phase letter in quotation marks (e.g., "A")
v2	second phase letter in quotation marks (e.g., "B")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p84, p145

Go to www.ssdanalysis.com for more information

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B",
NA, "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
trimbelow(cry,pcry,"A","B")
```

Trimline

Trimmed mean line added to ABplot

Description

Adds trimmed mean line to ABplot. Click in the phase of the ABplot to add line.

Usage

```
Trimline(behavior, phaseX, v)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v	letter of phase for which trimmed mean is desired in quotation marks (e.g., "A")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva Univesity, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p48, p130-131

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
ABplot(cry,pcry,"week","amount","Crying")
# now run Trimline(cry,pcry,"A")
```

Xmrchart

SPC XMR-chart

Description

The X-mR-chart can be use to detect changes within and between phases. Can be used with individual data, but it is not appropriate for group data.

Usage

```
Xmrchart(behavior, phaseX, v1, bandX, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
phaseX	phase variable
v1	phase bands are based upon in quotation marks (e.g., "A")
bandX	number of standard deviations desired (e.g., 2)
ABxlab	x-axis label in quotation marks (e.g., "week")
ABylab	y-axis label in quotation marks (e.g., "amount")
ABmain	main title for chart in quotation marks (e.g., "X-mR-Chart")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Bloom, M., Fischer, J. & Orme, J.G. (2009). Evaluating practice: Guidelines for the accountable professional (6th ed.). New York: Pearson.

Orme, J. & Cox, M.E. (2001). Analyzing single-subject design data using statistical proces control charts. *Social Work Research*, 25(2), 115-127.

Auerbach, Charles, and Zeitlin Wendy. *SSD for R: An R Package for Analyzing Single-Subject Data*. Oxford University Press, 2014. P75-76

Go to www.ssdanalysis.com for more information.

Examples

```
cry<-c(3, 4, 2, 5, 3, 4, NA, 2, 2, 3, 2, 1, 2, NA, 2, 2, 1, 2, 1, 0, 0, 0)
pcry<-c("A", "A", "A", "A", "A", "A", NA, "B", "B", "B", "B", "B", "B", NA,
"B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1", "B1")
Xmrchart(cry, pcry, "A", 2, "week", "amount", "X-mR-Chart")
```

XRchart

SPC XR-Chart

Description

This chart can be used when there are multiple observations per sample and uses the mean of each sample to create the chart.

Usage

```
XRchart(behavior, groupX, bandX, ABxlab, ABylab, ABmain)
```

Arguments

behavior	behavior variable
groupX	grouping variable
bandX	number of standard deviations desired (e.g., 2)
ABxlab	x-axis label in quotation marks (e.g., "week")
ABylab	y-axis label in quotation marks (e.g., "mean amount")
ABmain	main title for chart in quotation marks (e.g., "Admits to Hospital")

Author(s)

Charles Auerbach, PhD & Wendy Zeitlin, PhD; Yeshiva University, Wurzweiler School of Social Work

References

Auerbach, Charles, and Zeitlin Wendy. SSD for R: An R Package for Analyzing Single-Subject Data. Oxford University Press, 2014. p71, p105

Orme, J. & Cox, M.E. (2001). Analyzing single-subject design data using statistical process control charts. *Social Work Research*, 25(2), 115-127.

Go to www.ssdanalysis.com for more information.

Examples

```
admit<-c(85,90,80,84,82,79,75,76,80,84,75,80,79,83,88,78,80,85,83,
82,89,84,89,91,87,84,77,86,80,
89,81,86,88,83,86,90,86,85,85,87,80,89,NA,86,87,88,89,79,73,75,
74,70,75,81,85,75,73,75,
79,70,72,71,69,70,64,60,59,54,53,55,50,54,51,49,48,50,46,55,51,
55,49,50,48,51,33)
```

```
day<-c(1,1,1,1,1,1,1,2,2,2,2,2,2,3,3,3,3,3,3,4,4,4,4,4,4,5,
5,5,5,5,5,6,6,6,6,6,6,NA,7,7,7,7,7,7,8,8,8,8,8,8,9,
9,9,9,9,9,10,10,10,10,10,10,10,11,11,11,11,11,11,11,12,
```

```
12,12,12,12,12,12)
```

```
padmit<-c("A","A","A","A","A","A","A","A","A","A",  
"A","A","A","A","A","A",  
"A","A","A","A","A","A","A","A","A","A","A","A","A","A","A",  
"A","A","A","A","A","A","A","A","A","A","A","A","A","A","A",  
"B","B","B","B","B","B",  
"B","B","B","B","B","B","B","B","B","B","B","B",  
"B","B","B","B",  
"B","B","B","B","B","B","B","B","B","B","B","B",  
"B","B","B","B","B","B")  
XRchart(admit, day, 2, "week", "amount", "Admits to Hospital")
```

Index

*Topic \textasciitildekw1

ABanova, 3
ABarrow, 4
ABautoacf, 5
ABautopacf, 6
ABbinomial, 7
ABdescrip, 8
ABiqr, 9
ABlineD, 10
ABlines, 10
ABma, 11
ABplot, 12
ABplotm, 13
ABregres, 14
ABrf2, 15
ABrobust, 16
ABstat, 17
ABtext, 18
ABtspplot, 18
ABttest, 19
ABWilcox, 20
Append, 21
Aregres, 21
Arimadiff, 22
Arimama, 23
Arobust, 24
Cchart, 25
CDCabove, 26
CDCbelow, 27
diffchart, 28
Effectsize, 28
GABrf2, 29
GABttest, 30
Getcsv, 31
Gindex, 32
Gline, 33
Gmedian, 33
insert, 34
IQRbandgraph, 35

IQRlegend, 36
IQRline, 37
IRD, 38
listnames, 39
meanabove, 39
meanbelow, 40
meanES, 41
medabove, 42
medbelow, 43
metareg, 44
PANDabove, 45
PANDbelow, 46
PANDlegend, 47
Pchart, 47
PEMabove, 48
PEMbelow, 49
PEMlegend, 50
plotnum, 51
PNDabove, 52
PNDbelow, 53
PNDlegend, 54
Rchart, 54
Rchartsd, 56
regabove, 57
regbelow, 58
robregabove, 59
robregbelow, 60
RobustCDCabove, 61
RobustCDCbelow, 62
Savecsv, 63
SD1, 63
sd1bandgraph, 64
SD1legend, 65
SD2, 66
sd2bandgraph, 67
SD2legend, 68
SDAband, 68
SN, 69
SPClegend, 70

- SPCline, [71](#)
- SSDforR, [72](#)
- trimabove, [73](#)
- trimbelow, [74](#)
- Trimline, [75](#)
- Xmrchart, [76](#)
- XRchart, [77](#)
- *Topic **textasciitildekw2**
 - ABanova, [3](#)
 - ABarrow, [4](#)
 - ABautoacf, [5](#)
 - ABautopacf, [6](#)
 - ABbinomial, [7](#)
 - ABdescrip, [8](#)
 - ABiqr, [9](#)
 - ABlineD, [10](#)
 - ABlines, [10](#)
 - ABma, [11](#)
 - ABplot, [12](#)
 - ABplotm, [13](#)
 - ABregres, [14](#)
 - ABrf2, [15](#)
 - ABrobust, [16](#)
 - ABstat, [17](#)
 - ABtext, [18](#)
 - ABtsplot, [18](#)
 - ABttest, [19](#)
 - ABwilcox, [20](#)
 - Append, [21](#)
 - Aregres, [21](#)
 - Arimadiff, [22](#)
 - Arimama, [23](#)
 - Arobust, [24](#)
 - Cchart, [25](#)
 - CDCabove, [26](#)
 - CDCbelow, [27](#)
 - diffchart, [28](#)
 - Effectsize, [28](#)
 - GABrf2, [29](#)
 - GABttest, [30](#)
 - Getcsv, [31](#)
 - Gindex, [32](#)
 - Gline, [33](#)
 - Gmedian, [33](#)
 - insert, [34](#)
 - IQRbandgraph, [35](#)
 - IQRlegend, [36](#)
 - IQRline, [37](#)
 - IRD, [38](#)
 - listnames, [39](#)
 - meanabove, [39](#)
 - meanbelow, [40](#)
 - meanES, [41](#)
 - medabove, [42](#)
 - medbelow, [43](#)
 - metareg, [44](#)
 - PANDabove, [45](#)
 - PANDbelow, [46](#)
 - PANDlegend, [47](#)
 - Pchart, [47](#)
 - PEMabove, [48](#)
 - PEMbelow, [49](#)
 - PEMlegend, [50](#)
 - plotnum, [51](#)
 - PNDabove, [52](#)
 - PNDbelow, [53](#)
 - PNDlegend, [54](#)
 - Rchart, [54](#)
 - Rchartsd, [56](#)
 - regabove, [57](#)
 - regbelow, [58](#)
 - robregabove, [59](#)
 - robregbelow, [60](#)
 - RobustCDCabove, [61](#)
 - RobustCDCbelow, [62](#)
 - Savecsv, [63](#)
 - SD1, [63](#)
 - sd1bandgraph, [64](#)
 - SD1legend, [65](#)
 - SD2, [66](#)
 - sd2bandgraph, [67](#)
 - SD2legend, [68](#)
 - SDAband, [68](#)
 - SN, [69](#)
 - SPClegend, [70](#)
 - SPCline, [71](#)
 - SSDforR, [72](#)
 - trimabove, [73](#)
 - trimbelow, [74](#)
 - Trimline, [75](#)
 - Xmrchart, [76](#)
 - XRchart, [77](#)
- ABanova, [3](#)
- ABarrow, [4](#)
- ABautoacf, [5](#)
- ABautopacf, [6](#)

ABbinomial, 7
ABdescrip, 8
ABiqr, 9
ABlineD, 10
ABlines, 10
ABma, 11
ABplot, 12
ABplotm, 13
ABregres, 14
ABrf2, 15
ABrobust, 16
ABstat, 17
ABtext, 18
ABtsplot, 18
ABttest, 19
ABWilcox, 20
Append, 21
Aregres, 21
Arimadiff, 22
Arimama, 23
Arobust, 24

Cchart, 25
CDCabove, 26
CDCbelow, 27

diffchart, 28

Effectsize, 28

GABrf2, 29
GABttest, 30
Getcsv, 31
Gindex, 32
Gline, 33
Gmedian, 33

insert, 34
IQRbandgraph, 35
IQRlegend, 36
IQRline, 37
IRD, 38

listnames, 39

meanabove, 39
meanbelow, 40
meanES, 41
medabove, 42
medbelow, 43

metareg, 44

PANDabove, 45
PANDbelow, 46
PANDlegend, 47
Pchart, 47
PEMabove, 48
PEMbelow, 49
PEMlegend, 50
plotnum, 51
PNDabove, 52
PNDbelow, 53
PNDlegend, 54

Rchart, 54
Rchartsd, 56
regabove, 57
regbelow, 58
robregabove, 59
robregbelow, 60
RobustCDCabove, 61
RobustCDCbelow, 62

Savecsv, 63
SD1, 63
sd1bandgraph, 64
SD1legend, 65
SD2, 66
sd2bandgraph, 67
SD2legend, 68
SDAband, 68
SN, 69
SPClegend, 70
SPCline, 71
SSDforR, 72

trimabove, 73
trimbelow, 74
Trimline, 75

Xmrchart, 76
XRchart, 77