SOURCEBOOK

EASI Articles

Data Analysis

Abstract: This chapter provides step-by-step written instructions for obtaining basic statistical output using EASI. Simple examples for most undergraduate-level between-subjects and within-subjects research designs are provided.

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This document is part of an online statistics Sourcebook.

A browser-friendly viewing platform for this Sourcebook is available:
https://cwendorf.github.io/Sourcebook

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Frequencies

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Frequencies

Get the frequency distribution for the variable.

```
(Outcome) |> describeFrequencies()
```

Obtaining Summary Statistics

Get the percentiles for the variable.

```
(Outcome) |> describePercentiles()
```

Descriptives

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Frequencies

Get the frequency distribution for the variable.

```
(Outcome) |> describeFrequencies()
```

Obtaining Descriptive Statistics

Get the mean and standard deviation for the variable.

```
(Outcome) |> describeMoments()
```

Transformations and Standardized Scores

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Computing Transformations

Use a formula to calculate a new vector with the transformed scores.

```
trOutcome <- Outcome + 1
```

Create and display a the data set in a frame.

```
construct(Outcome, trOutcome)
```

Computing Standardized Scores

Create a new variable vector containing the standardized scores.

```
zOutcome <- scale(Outcome)
```

Create and display the data set in a frame.

```
construct(Outcome, trOutcome, zOutcome)
```

Correlations

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Descriptive Statistics

Get the means and standard deviations for the variables.

```
(CorrelationData) |> describeMoments()
```

Get the covariance matrix for the variables.

```
(CorrelationData) |> describeCovariances()
```

Get the correlation matrix for the variables.

```
(CorrelationData) |> describeCorrelations()
```

Obtaining Inferential Statistics

Get the correlation and its confidence interval. Though the confidence interval defaults to 95%, it can be changed if desired.

```
(CorrelationData) |> estimateCorrelations()
(CorrelationData) |> estimateCorrelations(conf.level = .99)
```

Test the correlation for statistical significance.

```
(CorrelationData) |> testCorrelations()
```

Regression

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Descriptive Statistics

Get the means and standard deviations for the variables.

```
(CorrelationData) |> describeMoments()
```

Get the covariance matrix for the variables.

```
(CorrelationData) |> describeCovariances()
```

Obtaining Inferential Statistics

Get the proportion of variance accounted for by the model.

```
(CorrelationData) |> estimateModel()
```

Test the regression coefficients for statistical significance.

```
(CorrelationData) |> testCoefficients()
```

Confidence Interval for a Mean

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Descriptive Statistics

Get the mean and standard deviation for the variable.

```
(Outcome) |> describeMoments()
```

Obtaining Inferential Statistics

Get the mean and its confidence interval. Though the confidence interval defaults to 95%, it can be changed if desired.

```
(Outcome) |> estimateMeans()
(Outcome) |> estimateMeans(conf.level = .99)
```

One Sample t Test

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Descriptive Statistics

Get the mean and standard deviation for the variable.

```
(Outcome) |> describeMoments()
```

Obtaining Inferential Statistics

Get the mean difference and its confidence interval. Though the confidence interval defaults to 95%, it can be changed if desired.

```
(Outcome) |> estimateMeans(mu = 7)
(Outcome) |> estimateMeans(mu = 7, conf.level = .99)
```

Test the mean difference for statistical significance.

```
(Outcome) |> testMeans(mu = 7)
```

Get the standardized effect size for the mean difference.

```
(Outcome) |> standardizeMeans(mu = 7)
```

Paired Samples t Test

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Descriptive Statistics

Get the means and standard deviations for the variables.

```
(PairedData) |> describeMoments()
```

Obtaining Inferential Statistics

Get the mean difference and its confidence interval. Though the confidence interval defaults to 95%, it can be changed if desired.

```
(PairedData) |> estimateDifference()
(PairedData) |> estimateDifference(conf.level = .99)
```

Test the mean difference for statistical significance.

```
(PairedData) |> testDifference()
```

Get the standardized effect size for the mean difference.

```
(PairedData) |> standardizeDifference()
```

Independent Samples t Test

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Descriptive Statistics

Get the mean and standard deviation of the dependent variable for each of the levels.

```
(Outcome~Factor) |> describeMoments()
```

Obtaining Inferential Statistics

Get the mean difference and its confidence interval. Though the confidence interval defaults to 95%, it can be changed if desired.

```
(Outcome~Factor) |> estimateDifference()
(Outcome~Factor) |> estimateDifference(conf.level = .99)
```

Test the mean difference for statistical significance.

```
(Outcome~Factor) |> testDifference()
```

Get the standardized effect size for the mean difference.

```
(Outcome~Factor) |> standardizeDifference()
```

OneWay ANOVA

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Descriptive Statistics

Get the mean and standard deviation of the dependent variable for each of the levels.

```
(Outcome~Factor) |> describeMoments()
```

Obtaining Inferential Statistics

Get the analysis of variance source table.

```
(Outcome~Factor) |> describeEffect()
```

Test the main effect for statistical significance.

```
(Outcome~Factor) |> testEffect()
```

Get the proportion of variance accounted for by the main effect.

```
(Outcome~Factor) |> estimateEffect()
```

Post Hoc Comparisons

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Descriptive Statistics

Get the mean and standard deviation for the dependent variable for each of the levels.

```
(Outcome~Factor) |> describeMoments()
```

Obtaining Inferential Statistics

Get all pairwise mean difference and their confidence intervals while adjusting them for multiple comparisons. Though the confidence intervals default to 95%, they can be changed if desired.

```
(Outcome~Factor) |> estimatePosthoc()
(Outcome~Factor) |> estimatePosthoc(conf.level = .99)
```

Test all pairwise mean differences for statistical significance while adjusting them for multiple comparisons.

```
(Outcome~Factor) |> testPosthoc()
```

Get standardized mean differences for all pairwise comparisons.

```
(Outcome~Factor) |> standardizePosthoc()
```

Repeated Measures ANOVA

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Descriptive Statistics

Get the means and standard deviations for the variables.

```
(RepeatedData) |> describeMoments()
```

Obtaining Inferential Statistics

Get the analysis of variance source table.

```
(RepeatedData) |> describeEffect()
```

Test the main effect for statistical significance.

```
(RepeatedData) |> testEffect()
```

Get the proportion of variance accounted for by the main effect.

```
(RepeatedData) |> estimateEffect()
```

Factorial ANOVA

Prior to the steps below, enter the data as appropriate for the analyses (described elsewhere). As always, the following commands should be typed directly in the R console window.

Obtaining Descriptive Statistics

Get the mean and standard deviation of the dependent variable for each of the levels. The “by” option tells EASI how to split the data.

```
(Outcome~FactorA) |> describeMoments(by = FactorB)
```

Obtaining Inferential Statistics

Get the analysis of variance source table.

```
(Outcome~FactorA) |> describeFactorial(by = FactorB)
```

Test the main effects for statistical significance.

```
(Outcome~FactorA) |> testFactorial(by = FactorB)
```

Get the proportion of variance accounted for by the main effects.

```
(Outcome~FactorA) |> estimateFactorial(by = FactorB)
```